

Psychology

for the IB Diploma Programme



This latest edition has been developed in cooperation with the IB in line with the new Subject Guide for first teaching in 2025.

The book includes the following features:

- Written by experienced teachers, it provides thorough explanations of concepts, contents and contexts as well as providing detailed examples to show how these interrelate. HL concepts are also explored in detail.
- Key studies are outlined and there are detailed examples of different research methods used by Psychology experts and professionals to help students form ideas for their own research methodology.
- Feature boxes help students to focus on specific areas of learning like TOK and critical thinking.
- Varied activities and comprehensive review questions help learners to recall what they have learned and consider their learning from different perspectives.
- Assessment support towards the end of the book includes advice on the final exam at SL and HL, the IA, EE and TOK.
- Answers to practice questions will be available in the eBook.

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Psychology for the IB Diploma Programme



Psychology

for the IB Diploma Programme

3rd Edition



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Authors' introduction

Welcome to the IB Diploma Program (DP) in Psychology.

Psychology is the scientific study of human and animal cognition and behavior. Psychology researchers attempt to describe, explain, predict and change behavior. They do this by forming hypotheses and theories regarding behavior and testing them empirically. Therefore, in general terms, psychology asks fundamental questions about why people think, feel and behave the way they do with the goal of solving problems and increasing the quality of life for individuals and their communities.

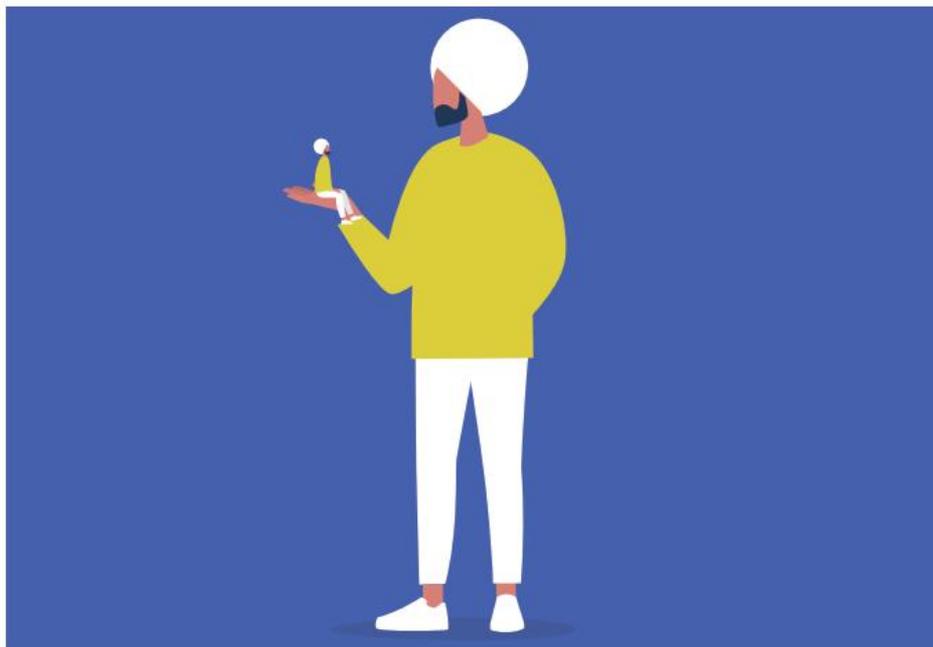
Psychology is a compelling field that combines scientific inquiry with a focus on human experience, seeking to explain why individuals behave as they do by focusing on how various factors influence our actions, thoughts and feelings. You will explore the dynamic interaction between biological, cognitive and sociocultural perspectives on a wide range of human behaviors, and develop skills to analyze and interpret research as well as applying psychological ideas to real-life situations.



In DP Psychology, you will engage with key concepts. These are listed by the IB as bias, causality, change, measurement, perspective and responsibility. They will provide a foundation for understanding how psychology is applied across various contexts and content. Therefore, the course places a strong emphasis on critical thinking, encouraging you to go beyond memorizing facts to consider the broader implications of theories and research. You will gain experience with research methodologies and become skilled at evaluating evidence, understanding how psychological knowledge is built through rigorous investigation. This conceptual understanding will be complemented by class practicals, where you will put theory into practice, analyze data, and evaluate psychological research.

The course is structured around the integration of concepts, content and context. These three elements work together to deepen your understanding of how psychological knowledge is applied to real-world issues. You will examine four major contexts—health and well-being, human development, human relationships, and learning and cognition. Through this approach, you will learn how to connect theoretical knowledge with practical application, preparing you to think

critically about how psychological insights can be used to understand and improve people's lives.



This book is structured into the following sections:

Concepts: An introduction to key notions: bias, causality, change, measurement, perspective and responsibility, and the impact of these concepts on psychological knowledge. Concepts are also interwoven through the entire book while concept sections are also provided at the end of each chapter where appropriate. This is to ensure you have comprehensive knowledge of how the concepts impact each area of the psychology course.

Content: An exploration of the Biological, Cognitive, and Sociocultural Approaches and a comprehensive discussion of Research Methodology.

Contexts: An exploration of the specific Context areas of Health and Well-being, Human Development, Human Relationships, Learning and Cognition.

Assessment: Guidance on answering questions for Paper 1, Paper 2 and Paper 3 (HL Only).

Internal Assessment (IA): Comprehensive instructions on researching and presenting a research proposal.

Extended Essay (EE): Guidance on researching and writing an EE in Psychology.

Theory of Knowledge (TOK): A discussion of the implications of knowledge production and acquisition in psychology research.

At the Standard Level (SL), you will develop a solid foundation in psychological principles, while at the Higher Level (HL), you will have the chance to explore additional perspectives on culture, motivation and technology, examining how these factors influence human behavior. The HL extensions provide a deeper layer of inquiry into the roles of cultural context and technological advances in shaping human

experiences, allowing you to gain a more nuanced understanding of psychological phenomena. Additionally, HL students will engage in further data analysis and interpretation, furthering your ability to critically assess and apply research findings.

The DP Psychology course is not designed to produce psychologists, but rather to develop psychological literacy—a skill set that includes understanding the principles of psychology, analyzing human behavior, and applying psychological knowledge ethically and responsibly. Psychological literacy promotes personal insight and cultural awareness, which will enhance your ability to think critically and empathize with others in an ever changing, globalized world. Through the study of psychological theories and models, you will gain tools to examine complex human behaviors, from cognitive processes to social interactions, and learn how psychological science contributes to our understanding of issues like mental health, human relationships and learning.



The course also links closely with the core components of the IB DP, including TOK, Creativity, Activity, Service (CAS) and the EE. In TOK, psychology serves as an example of how human sciences approach knowledge production, connecting psychological inquiry to broader questions about how we know what we know. The subject also offers valuable insights into the ethical dimensions of knowledge and challenges you to think about the responsibility that comes with understanding and researching human behavior. Through CAS, you may find opportunities to apply psychological knowledge in service projects, such as those that support mental health awareness or community engagement. For students interested in conducting extended research, the EE in Psychology allows a deep dive into topics of personal interest, applying psychological frameworks to real-world questions and developing advanced research skills.

By the end of the course, you will be equipped to evaluate psychological theories, consider multiple perspectives on behavior, and think critically about the research processes that create knowledge. DP Psychology fosters a lifelong interest in understanding human nature and an appreciation for the diversity of human experience. We hope that your exploration of psychology will enrich and inspire you to apply this knowledge to create positive change in yourself and the world around you.

How to use this book

This book includes lots of useful features to help your understanding. You will find the purpose of each box explained below:

Learning objective

These boxes appear at the start of each main section, outlining the key areas of study and highlighting what you can expect to learn.

Key study

Key study boxes provide a clear breakdown of psychological research papers, summarizing their aims, methods, results, and conclusions.



Conceptual question

In Conceptual questions boxes, you will find questions which relate to the main concepts of Psychology and help you to see connections across concepts, contents and contexts.



Interesting fact boxes provide engaging extra information to spark your curiosity and deepen your understanding of the topic as a whole. They may offer detailed explanations of experiments, highlight cultural or historical contexts, or reveal surprising connections.

Activity

You will be prompted to actively engage in answering questions and conducting your own research into key areas with the help of Activity boxes.



Important points for you to remember are summarized in Key Fact boxes.

Critical thinking

Critical thinking boxes encourage you to analyze and evaluate the ideas and studies presented by posing questions that challenge their assumptions and key aspect

You are now ready to begin. Good luck with your studies!
Dr Christian Bryan, Peter Giddens, Dr Ellen Heyting



TOK is a core component of the IB DP. TOK boxes ask you to think about the nature of knowledge in psychology; and ask you to reflect on your knowledge and how you acquired it.



Connections boxes show how some themes might appear in more than one concept, content or context area. Some connection boxes also contain information for further exploration.



Hint boxes provide tips on how to approach concepts, topics and theories, especially with regard to your IB assessments.



These boxes explain new terms and concepts you might not have come across before.

The background is a vibrant, abstract composition of overlapping, curved shapes in various colors including red, yellow, orange, blue, teal, purple, and green. The shapes have a layered, 3D effect. A white circle is positioned on the right side of the image, containing the word "CONCEPTS" in a bold, white, sans-serif font.

CONCEPTS

Learning objective

You should be able to understand and coherently and accurately synthesize the DP's six concepts across the course's contexts and content:

- Bias
- Causality
- Change
- Measurement
- Perspective
- Responsibility

Introduction to concepts

In psychology, a **concept** refers to an abstract idea that helps to organize and understand **behavior**. For example, "memory" is a concept that encompasses processes such as encoding, storing and retrieving, all of which are essential in understanding how people remember and forget information. "Personality" is a concept that encapsulates the thoughts, feelings and behaviors that define a person's individuality and affect how that person reacts to other people and the world.

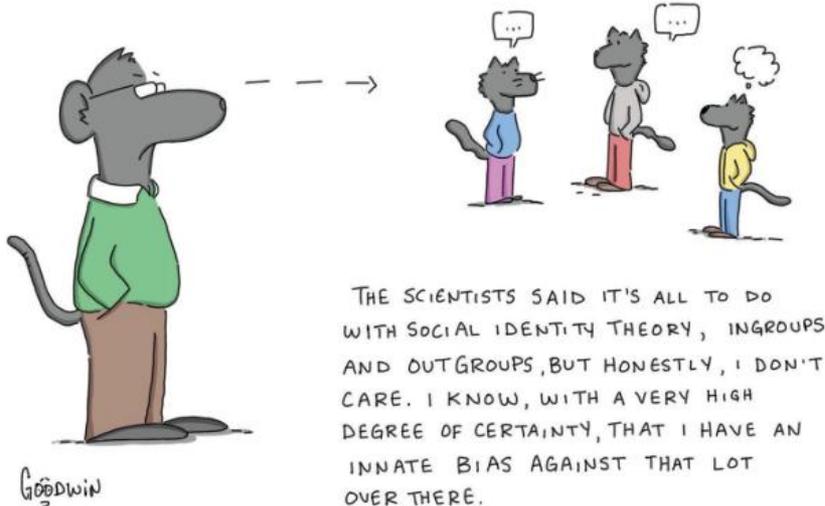
Concepts are useful tools for describing, explaining and predicting human behavior. They allow psychologists to understand human behavior.

To what extent does language limit our **conceptual understanding**? Are concepts inherently too simplistic? For example, concepts are useful tools for describing, explaining and predicting human behavior, but they reduce our understanding of individuals and their personal nuances.

TOK



Bias



Conceptual question

To what extent is *bias* in psychology research and clinical practice an inevitable result of **schemas** and evolutionary adaptations? To what extent should bias be consciously recognized and actively mitigated through cognitive processes?

Bias is a cognitive limitation that affects objectivity and decision-making by influencing people's perceptions and interpretations of information. Shaped by personal experiences, cultural backgrounds and preferences, biases tend to make people interpret evidence in ways that align with their existing beliefs. For example, **confirmation bias** may lead people to seek out research that supports their own views on a topic (such as adolescent depression) while disregarding contradictory information.

Biases act as heuristics or mental shortcuts, speeding up decision-making and minimizing cognitive effort. This suggests that they may be evolutionary behaviors. However, biases often result in misinterpretations, errors in judgment and the perpetuation of stereotypes and prejudices. By recognizing biases, people can improve the objectivity, and therefore the accuracy, of their thinking and decision-making processes.

Activity 1

Bias is not limited to psychological research; it affects all our decision-making processes and is a common feature of the world around us. Pick two current event media articles on the same topic from two different sources. They won't be the same. Where can you find evidence of bias influencing the way the event has been reported?

Concept-related terms

Researcher bias

Researcher bias is the intentional or unintentional influence and distortion that researchers may impose on their research because of their beliefs or expectations. Researcher bias occurs when researchers allow their own biases to affect the



You will learn more about confirmation bias on pages 58–59.



The 2008 Global Financial Crisis was triggered by the overconfidence bias and the availability heuristic because bankers assumed the current trend of increasing house prices would continue. This shortcut in thinking (heuristic) meant bankers underestimated the risk of subprime mortgages, which contributed to the banking and insurance collapse and triggered the Global Financial Crisis.

research, including the choice of the research topic and its aim, design and data collection and data analysis methods. For example, a researcher who strongly believes in the effectiveness of **cognitive behavioral therapy (CBT)** may unconsciously design a study in a way that favors outcomes supporting that belief. Ambiguous data may be interpreted in a way that supports the researcher's preconceptions, resulting in a biased conclusion. Therefore, it is important for researchers to use rigorous methodological practices to eliminate the effects of researcher bias and so ensure the integrity of their research.

Participant bias

Participant bias occurs when research participants behave differently than they would if they were not research participants, perhaps because they want to fit in with other participants, they want to be seen in a better light than they usually are, or they want to help or hinder the researcher. Participant bias may be conscious or unconscious. For example, in a study investigating racism, participants may respond in the way they believe society expects them to respond, rather than giving their actual opinions. Participant bias can render research results invalid, therefore, researchers must ensure participants know their responses are anonymous and confidential.

Reliability

Reliability refers to a study's ability to be repeated and achieve the same or similar results. Reliability increases a study's accuracy, **validity** and **credibility**. A study with high reliability generates consistent results when conducted repeatedly under the same conditions by the same or different researchers. *Bias* compromises reliability by consistently distorting research results, creating a false impression of reliability. Uncontrolled **variables**, inconsistent participant selection procedures and inconsistent data collection and measurement methods reduce a study's reliability (Figure 1.1).

Participant bias is sometimes called the Hawthorne effect. In the 1920–30s, researchers at the Hawthorne Works studied how different lighting affected employee productivity and found that productivity increased not only when the lighting was better, but also when it was worse. The effect was attributed to the workers knowing they were being observed, which motivated them to work faster despite the changes in lighting.



Figure 1.1 A study testing the effect of a new method for teaching reading will have low reliability if the study has a small sample size, lacks random participant selection, does not control extraneous variables or uses subjective measurement tools or analysis methods.



To improve a study's reliability, researchers must apply rigorous methodological practices to ensure the procedure's consistency and replicability.

Inter-rater reliability

Inter-rater reliability bias refers to differences in raters' or observers' judgments that weaken the reliability of research conclusions. It indicates the extent to which observers of participant behavior agree. A high level of agreement is needed to ensure consistent measurements. When there is high inter-rater reliability, the raters are likely to reach the same conclusions, which improves a study's reliability. Subjective biases due to different personal perspectives, experiences and expectations weaken inter-rater reliability, and this leads to different interpretations of a study's measurement criteria. For example, if several researchers observe children's playground behavior but interpret aggressive behavior differently based on personal perceptions of aggression, inter-rater reliability will be reduced.

This bias can be eliminated by clearly defining and operationalizing (putting into use) the behavior being observed and rated, and by implementing thorough researcher training that emphasizes the need for standardization of measurements. Standardizing the raters' interpretations of participant behavior reduces inter-rater differences and so increases the study's inter-rater reliability, which strengthens the study's overall reliability.

Reflexivity

Reflexivity refers to researchers' conscious and continuous acknowledgment of their own biases and how these affect their research. It involves researchers reflecting on their backgrounds, experiences, attitudes and perceptions to be alert for biases that may affect their research – including the choice of topic and the study's aim, the research design, participant selection, procedure and interpretation of results.

Reflexive researchers eliminate the influence of their biases from the research process and so improve their study's reliability and validity. For example, a researcher investigating alcohol use would consider their own attitudes, beliefs and experiences of alcohol use and think about how these might affect their decisions, such as selecting participants who match their preconceptions of alcohol users, or interpreting study results or reaching conclusions that reflect or support their own preconceptions.

By being reflective, researchers can eliminate biases and so generate objective, impartial and credible research results.

Publication bias

Publication bias is the tendency of researchers, authors and academic journal editors to prefer research into new, popular or politically advantageous topics, or to prefer positive or statistically significant findings. Researchers want to have their research published, so they are likely to select topics or behaviors that journal editors will prefer. Editors are most likely to favor research topics that are trending (currently popular), or which contribute to current public discussions.

Publication bias leads to the academic community and the public developing a biased perception of some behaviors because of the disproportionate emphasis on only positive results or popular topics. For example, consider a study testing the effectiveness of a treatment for cigarette smoking by teenagers. If the study shows the treatment achieves a significant reduction in teenagers' cigarette use, it is more



Rosenhan (1973), on pseudo-patients in psychiatric hospitals, is a good example of inter-rater reliability issues. Clinicians' diagnoses differed even when the pseudo-patients behaved normally, highlighting inconsistencies in diagnoses. Rosenhan (1973) can be used in exam answers on reliability, diagnosis and ethical considerations, showing how one study can apply to multiple exam topics.

likely to be published; if it finds the treatment achieves no significant change in behavior, it is less likely to be published. As a result, literature searches would not show the results of this study, and researchers would not know that the treatment is ineffective. Therefore, by correcting publication bias, researchers and academic journal editors can promote more comprehensive and balanced knowledge in academic literature.

Gender bias

Gender bias refers to favoring or discriminating against people on the basis of their gender. Deep-rooted social norms about gender roles can affect researchers' perceptions of behavior and their interpretation of data, resulting in biases in the choice of research topics, research design, participant selection, data interpretation and conclusions. Research has typically been conducted by men on male participants. This perpetuates biases in favor of male experiences, which are then generalized to both male and female behavior. For example, in a study on business management, researchers may recruit mostly male participants, leading to results associated with masculinity. The study may not capture management behaviors associated with femininity and so would perpetuate gender stereotypes.

Similarly, research on parenting in adoptions typically focuses on the mother's behavior, not the experiences of adoptive fathers (Figure 1.2). This can perpetuate stereotypes and affect policies and support services that neglect the needs of male adoptive parents. Therefore, gender bias results in incorrect outcomes when research-related decisions are based on people's gender when gender is not a significant criterion for the decision.



Figure 1.2 Can you think of roles for which some people hold gender stereotypes?

Cultural bias

Cultural bias is the inclination to discriminate against or in favor of people's **cultures**, leading to conclusions based on cultural backgrounds. Cultural bias can be explained by **social identity theory**, which proposes that people favor others they identify with (those from their **ingroups**) and discriminate against people from their **outgroups**. For example, a standardized science test from the UK may disadvantage students from a Fijian background, because the Fijian students may struggle to understand British cultural references or language used in the tests. Cultural bias can also occur in research, for example, if French researchers studying responses to stress among French participants, some of

Do not confuse culture with ethnicity and nationality. Culture refers to shared values, beliefs and behaviors within a group. Culture can be shared by people of different ethnicities and nationalities. Remember too that people from the same ethnic background or country can have diverse cultural experiences and perspectives.



whom are Moroccan immigrants, design a study using only French cultural norms and assumptions. If the researchers expect all participants to freely share their experiences of stress, they will overlook the fact that, in Moroccan culture, expressing emotions in formal settings is less common. The research findings would understate the stress levels of Moroccan participants, leading to biased conclusions. Cultural bias can result in inappropriate outcomes for some people when a decision is based on a person's culture when culture is not a significant criterion for the decision.

Activity 2

Discuss the following with both your peers and people you live with.

- To what extent globalization has affected or even eliminated cultural aspects of daily life/behavior in your family/school/region/country (for example, has fast food such as burgers replaced traditional national or local dishes?)
- What differences are there in teaching methods and behavior in schools in different places and at different times? Does education now include more variety like field trips, independent work and guest speakers as opposed to students copying and making notes? What impact does this have?
- In what ways have traditional and family events like weddings and festivals been affected by globalization and other cultures?
- Does globalization make culture more or less important as an area of research?

Cognitive biases

Cognitive biases are errors in thinking and decision-making processes. They occur because people use irrational or subjective information, rather than objective logic, to make their decisions. Cognitive biases arise from mental shortcuts (heuristics), which simplify and speed up information processing and so require less cognitive effort.

Confirmation bias is one example of many cognitive biases. It occurs when people seek out and accept information that aligns with their existing beliefs and dismiss contradictory information. For example, a person who is strongly aligned with socialist ideology may exclusively access socialist news sources and ignore alternative ideologies. Cognitive biases lead to flawed opinions and decisions.

Sampling bias

Sampling is the process of selecting a subset of a population for a study to represent a larger population (Figure 1.3). **Sampling bias** occurs when the selected participants are not representative of the population to which the study's conclusion is applied. This bias occurs when certain subgroups are either over-represented or under-represented in the sample, due to the method of selection. For example, if a study investigating high school students' opinions on learning foreign languages takes its sample from an international school, the participants in the study are likely to be multi-lingual and not typical of all high school students. Therefore, the study's conclusions will be biased toward the opinions of people who are already multi-lingual.

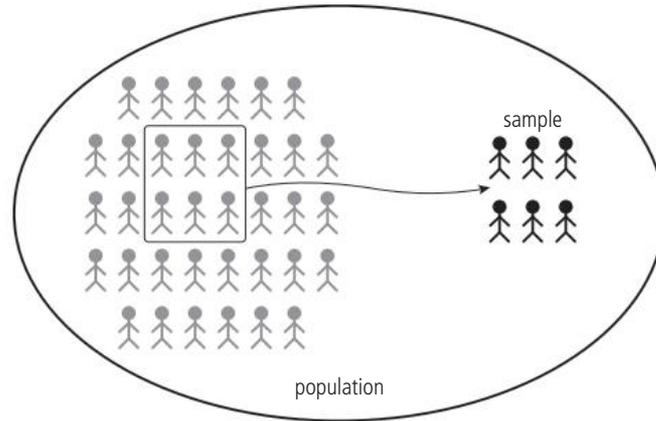


Figure 1.3 Taking a sample.

Can a sample ever be truly “randomly selected”?

TOK

In **random sampling**, each member of the target population has an equal probability of being selected for the study. Random sampling can be biased if the selected participants differ from the target population. For example, if a researcher conducts a study on smartphone usage among teenagers but the sample includes participants of all ages, the results will include smartphone usage by non-teenagers.

If every action has a cause, can we ever identify an original cause, or are we bound to an infinite regress of causes?

TOK

In **stratified sampling** (when random samples are drawn from subgroups of the population), the research can be biased if some subgroups are over- or under-represented. For example, the results of a study of academic achievement and socioeconomic status that does not include many low-income participants will be skewed.

Opportunity sampling is a non-random sampling technique in which participants are selected because they are easily accessible to the researchers – for example, if they are all students at the researcher’s university. Opportunity sampling can lead to bias because the participants are unlikely to represent the target population. The study would be biased because university students are not representative of the wider population.

i

The “butterfly effect” shows how tiny causes can ripple into major and far away events. Imagine a butterfly in the Amazon rainforest flapping its wings, creating a slight disturbance in the air. This tips one drop of water to the ground, which evaporates into the atmosphere, affecting clouds that form into a hurricane that moves up the coast and develops into a tornado that hits a town in Midwest USA. The tornado damages a shop and someone takes the opportunity to loot a flatscreen television. The police catch the looter, and eventually the judge asks the looter what caused the crime. “Your Honor, there was a butterfly...”

Determinism

Determinism is a philosophical **approach** which proposes that all behavior is the result of external influences such as **genetic inheritance** and environmental conditions. Biological determinism assumes that human behavior, including **cognitive processes** and personality traits, is caused by genetic predispositions and physiological mechanisms. Environmental determinism assumes that behavior is caused by factors such as family upbringing, cultural influences and life experiences. For example, exposure to biased information within the family environment or adherence to rigid cultural norms can contribute to the formation of stereotypes, leading to biased perceptions.

Psychological determinism proposes that events occur in a predictable manner and that behavior is caused by specific variables – genes, culture, the physical environment, past experiences, etc. When researchers believe in determinism, they tend to assume that certain variables inevitably result in certain behaviors (Figure 1.4).



Figure 1.4 According to behaviorist principles, people do not choose of their own free will to be afraid of dogs; the fear is determined by previous unpleasant experiences of dogs.

In relation to bias, determinist beliefs can affect how researchers interpret data, and this can lead them to overstate or understate certain causes. For example, a researcher with a strong preference for biological determinism might focus too much on genes to explain anxiety disorders and not enough on social or environmental explanations. This creates bias in research because the complexity of behavior is reduced to single variables, leading to incomplete or skewed research results.

Determinism in research can result in confirmation bias if deterministic researchers only look for evidence that supports their deterministic belief and not for evidence that could result in a more nuanced understanding of the behavior being studied.

Positivism

Positivism is a research approach that aims to establish universal explanations of behavior through objective and replicable **quantitative research** methods that generate **empirical evidence**. Positivist research generates **empirical data** through systematic observation and aims to show patterns and relationships that can be generalized to broader or target populations. For example, a study on adolescent depression conducted from the positivist approach would likely use quantitative methods such as experiments to determine causal factors. *Bias* can affect positivist research if the researchers' assumptions distort the selection of variables or the interpretation of data, leading to distorted results and conclusions.

Researchers may study **correlations** between variables (such as socioeconomic status, family structure, diet, physical activity, alcohol and tobacco use, and depression levels in adolescents) to generate empirical evidence that demonstrates cause-and-effect relationships. Positivism emphasizes the use of objective **research methods** to generate empirical evidence and establish universal explanations of behavior.

Reductionism

To what extent does reductionism help or hinder our understanding of human nature? For example, while a reductionist approach often focuses on identifiable factors to make causal relationships clearer, it can overlook contexts and the interconnectedness of variables, resulting in oversimplification.

TOK

Reductionism is a research approach that breaks down complex behavior, such as cognition and decision-making, into simpler, more manageable components to make understanding the behavior easier. The reductionist approach often focuses on identifiable factors to make causal relationships clearer. Reductionism can overlook **contexts** and the interconnectedness of variables, resulting in oversimplification. For example, in researching adolescent depression, a reductionist approach might focus only on biological variables such as **neurotransmitters** or genes to determine the cause of depression. This approach would neglect psychosocial factors such as socioeconomic status, leading to incomplete conclusions. Reductionism can help researchers understand the underlying mechanisms of behavior by focusing on simple factors, but it risks oversimplification and therefore bias by neglecting broader contexts and other factors.

Holism

Holism recognizes the complexity of individual experiences by examining behavior within its broadest context and considers the simultaneous interaction of many factors. The holistic approach acknowledges that behavior is influenced by a complex interplay of many variables, including biological, psychological, social and environmental factors. Rather than isolating variables, the holistic approach recognizes the interconnectedness of all variables. For example, in studying adolescent depression, researchers who adopt the holistic approach would likely use **qualitative research** methods such as interviews to explore adolescents' full experiences, including the influence of their family relationships, friendships, school stress and cultural factors. Researchers' personal *biases* can distort their perspectives or assumptions. This may affect which factors they emphasize and so distort the interpretation of interactions of variables.

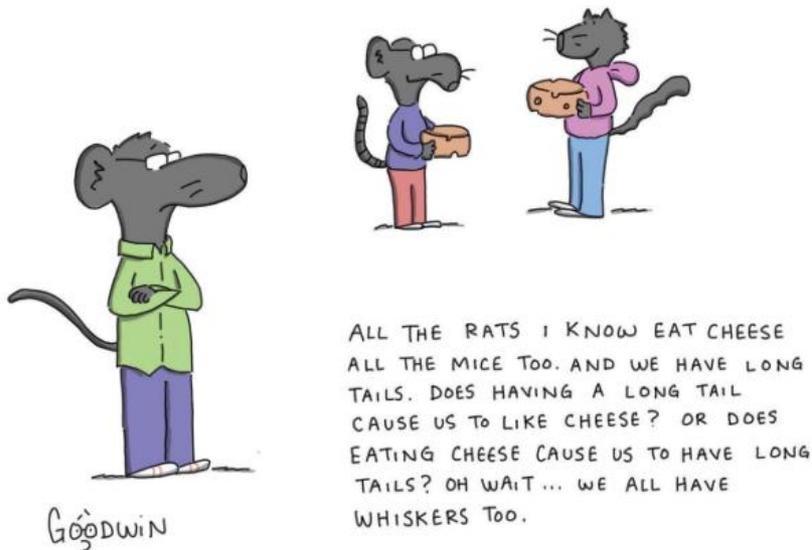
Therefore, holism works toward comprehensive understanding of behavior by considering the interaction of biological, psychological and social factors.

To what extent are complex phenomena oversimplified, leading to incomplete or misleading explanations?

TOK



Causality



Conceptual question

How can we know the *causes* of human behavior?

Causality refers to how one variable affects another variable – that is, how changes in one variable result in changes to another variable. Psychologists aim to establish such cause-and-effect relationships through research. A variable is any factor, characteristic or condition that can change in an experiment. A variable can be manipulated, controlled or measured. For example, in an experiment studying the effects of caffeine on memory, the quantity of caffeine consumed and participants' memory performance are both variables.

An **independent variable** is the variable that the researcher manipulates or controls (for example, the quantity of caffeine) to observe its effects on the dependent variable (the memory performance). The independent variable is the “cause” in the cause-and-effect relationship.

A **dependent variable** is the variable that is measured or observed when the independent variable is changed. It is the “effect” in the cause-and-effect relationship. For example, in the caffeine-memory experiment above, memory performance is the dependent variable.

Human behavior, though, is complex, and causality can involve many variables interacting simultaneously.

Activity 3

In groups of 3–4, create a list of all the variables you can think of that could have an effect on a student's performance in school. How would you proceed with research to determine which variables really do affect performance?

Activity 4

Causality is central to the way we learn new things as humans. Young children are often called “little scientists” as they explore how the world around them works. Have you ever watched a young child open and shut a door on a toy hundreds of times, or put blocks into a container only to take them out again over and over again? What do you do when you encounter a new piece of technology? Do you explore its features to see how it works? Next time you download a new app on your phone or use a tablet in school, consider how you explore its uses and features. Think about the input from your fingers on the screen and the output from the app – that is causality in action!

Concept-related terms

Reciprocal determinism

Reciprocal determinism is the idea that people both affect and are affected by their environment. It suggests a dynamic interaction between a person’s behavior, their internal cognitive processes and their environment. An example of reciprocal determinism can be seen in the relationship between a student and their academic performance. The student’s study habits and **motivation** can affect their academic success, while receiving positive feedback from teachers or accessing educational materials (environmental factors) can affect the student’s motivation and study habits.

Reciprocal determinism emphasizes the bidirectional nature of influence between people and their environment; it suggests that behavior is not only determined by internal factors such as cognitive processes and personality, or external factors such as environmental conditions and societal norms, but rather by their continuous interaction. Therefore, reciprocal determinism refers to the dynamic relationship between people and their environment, with each affecting the other (Figure 1.5). It emphasizes the complexity of human behavior and the importance of considering the interplay between internal and external factors in understanding behavior.

Bidirectional ambiguity

Bidirectional ambiguity refers to the uncertainty of the direction of causality between two variables – for example, if two variables are found to be related, but it is unclear if one variable causes the other to change; if the relationship is the opposite; or if a third variable may be involved. For example, a study that establishes a correlation between poor sleep quality and high anxiety levels may generate bidirectional ambiguity because it is not clear whether high anxiety causes poor sleep quality, poor sleep quality causes high anxiety, or if both are caused by a third variable such as poor diet. Bidirectional ambiguity makes definitive conclusions about causality difficult.

Reductionism

Reductionism is the philosophical approach that tries to break down complex phenomena to make them easier to understand. Reductionism tries to explain cause-and-effect relationships by reducing them to interactions between basic elements. For example, the reductionist approach might try to explain behavior only in terms

of biological phenomena such as **neurotransmission** or genetics. This approach would ignore the influence of social, cultural and environmental factors on behavior. Reductionism can offer valuable insights by isolating specific variables and understanding their individual contributions to a phenomenon, but it risks oversimplifying complex phenomena by overlooking the intricate interactions between various factors that may influence causality. Therefore, reductionism in causality involves simplifying complex phenomena by focusing on individual components or variables. While reductionist approaches provide useful insights, they tend to oversimplify explanations of behavior.

Validity

Validity refers to the extent to which research accurately measures the concept it claims to measure. It indicates the degree to which a study's results are trustworthy and believable. For example, the validity of a study that aims to measure the effectiveness of a new teaching method would depend on how accurately the chosen measures (for example, test scores) reflect the impact of the teaching method on student learning.

Internal validity indicates the extent to which observed effects within a study can be attributed to the manipulated independent variable rather than confounding variables. Internal validity ensures that a study's results accurately indicate the causal relationship between the independent and dependent variables. **External validity** refers to the extent to which a study's findings can be generalized to other populations. **Mundane realism** indicates the degree to which a study's setting and procedures are similar to real-life situations.

In summary, validity ensures that a study's results accurately reflect the phenomenon being studied. Internal validity ensures that observed effects result from the manipulated variables. External validity ensures that the study's findings can be generalized to other populations. Mundane realism ensures that research findings can be applied to real-world situations.

Example of internal validity

Dinges et al. (1997) investigated the effects of sleep deprivation on cognitive performance. Conducted in a controlled laboratory setting, the study shows high internal validity because the researchers manipulate sleep by dividing participants into two groups: one that sleeps for eight hours and one that sleeps for four hours. Both groups complete cognitive tasks, such as reaction-time tests and simple recall tests, under identical conditions. By controlling **extraneous variables** such as air temperature, the difficulty of the tests, and the time of day, the researchers can be sure that the observed differences in behavior can be directly attributed to the manipulated variable (sleep duration) and no other variables. The results show that the sleep-deprived participants performed significantly worse, confirming that cognitive degradation is caused by lack of sleep. The study's internal validity is high because the effects can confidently be attributed to sleep deprivation, because other factors were controlled.

Example of external validity

Latané and Darley (1968) investigated bystander intervention by testing the likelihood of people helping in emergency situations based on the number of other bystanders at the scene. Participants were seated in a laboratory where they heard someone

in distress, and their responses were recorded. The study found that when more bystanders were present, the participants were less likely to help. This study has high external validity because its results were supported by real-world observations of similar behavior, so the results were generalizable beyond the laboratory.

Controls

Experimental controls are incorporated into the design of research studies to exclude the influence of extraneous variables. They increase a study's validity. Extraneous variables are variables other than the independent variable that may affect the dependent variable and confound the study's results. Controls help researchers isolate the independent variable's effect on the dependent variable and minimize the possibility of alternative explanations for the observed results. For example, in a study testing the efficacy of a new medication on reducing depression, controls may include giving some participants a **placebo** (an inert pseudo-medication) to rule out the placebo effect (a participant believing they are receiving treatment even though they are not).

Randomly allocating participants to the study's experimental and control groups helps to ensure that extraneous participant variables, such as different personalities, are evenly distributed between the groups. **Double-blind design** keeps both participants and researchers unaware of which participants receive the treatment and which are in the control group. For example, an experimental study that has some participants taking a medication and some taking a placebo is considered a double-blind study if both the participants and the researchers do not know which participants are taking the medication and which are taking the placebo. Therefore, controls are essential research requirements that ensure the validity and reliability of results. By minimizing the effects of extraneous variables and using control procedures such as placebos and double-blind techniques, researchers can strengthen a study and draw more accurate conclusions.

Significance

Significance refers to the statistical probability of an observed relationship between variables occurring by chance. It indicates the probability that the observed effect is genuine and not the result of a random variation in the data. For example, in a study investigating the relationship between exercise and mood, researchers find a statistically significant correlation between exercise frequency and self-reported mood levels. This indicates that the observed relationship between exercise and mood is unlikely to have occurred by chance.

Statistical significance is determined using hypothesis testing; researchers compare the observed data to what they would expect to see if there were no relationship between the variables (the null hypothesis). If the probability of seeing the observed result under the null hypothesis is low (usually less than 0.05p), the result is considered statistically significant. Therefore, significance testing plays an important role in ensuring the strength and reliability of cause-and-effect relationships between variables.

Complexity

Complexity refers to the multifaceted nature of relationships between variables. It acknowledges that behavior in a real-world setting often involves many interacting

factors that make it challenging to attribute causality to one variable. For example, in a study investigating the variables influencing academic achievement in students, researchers may identify numerous variables that could potentially affect academic performance, including socioeconomic status, parental involvement, teacher quality and student motivation. Understanding the causal relationships among these variables involves considering their interconnections and how they collectively contribute to academic performance.

Complexity highlights the dynamic interactions and feedback loops that exist in behavior. Therefore, complexity challenges establishing causal relationships between variables and requires researchers to adopt holistic and **systems-oriented approaches** to evaluate the interconnectedness of factors. By appreciating complexity, researchers can generate more detailed explanations of the underlying mechanisms driving phenomena and so develop more accurate models of causality.

Influence and interaction

Influence and interaction describe how variables relate to each other. Influence refers to the effect of one variable on another; interaction refers to the combined effect of more than one variable on an outcome. For example, in a study investigating behavior during studying and academic performance, behavior during studying may be shown to directly affect academic performance (influence). Yet, if the behavior during studying's effect on academic performance varies depending on the time spent sleeping and the time spent doing physical exercise, there is an interaction between behavior during studying, sleep and exercise.

Influence refers to a one-way relationship between variables, where changes in one (independent) variable lead to changes in another (dependent) variable. Interaction is the combined effect of more than one variable, which may increase or decrease the effects of each separate variable. Interactions show the complexity of cause-and-effect relationships. Therefore, influence and interaction are necessary for understanding causality. Influence describes direct one-to-one relationships between variables. Interaction describes the combined effects of more than one variable and emphasizes the complexity of cause-and-effect.



Agency and motivation

Agency refers to a person's ability to make decisions and take action to achieve outcomes. It is the sense of autonomy that people feel over their decisions and actions. Motivation refers to the internal and external factors that make behavior happen, influencing the intensity and endurance of behavior (Figure 1.5).

Agency and motivation are related to causality because they affect initiation and maintenance of behavior; together, they determine the decisions people make to achieve outcomes. Agency is a person's sense of control and ability to create change. Motivation is the person's internal enthusiasm for achieving that goal. Therefore, agency and motivation are fundamental factors in causality because they directly affect people's behavior.

Figure 1.5 Having set a goal of improving academic grades, a student's agency is seen in their ability to behave toward achieving an outcome such as writing a study plan, approaching teachers for help, attending all lessons and being focused in those lessons. The student's motivation determines their willingness and determination to spend time and effort to achieve the goal.

Change



Conceptual question

How do psychologists identify *change* in behavior?

Change refers to the modification of behavior, including thoughts and emotions. It can be slow (for example, in terms of human development) or relatively fast (for example, mood changes). Change can be caused by deliberate and conscious human action or by biological variables. Psychologists study change, and consider factors such as free will and determinism, to offer effective treatments. They consider behaviors such as managing stress, while recognizing people's inherent unwillingness to change. By evaluating treatments and interventions, psychologists try to create significant, lasting changes in people's behavior.

Activity 5

List five behaviors that you have changed over the last few years. For each, explain why the change occurred. To what extent did the change occur because of your motivation?

Concept-related terms

Barriers to change

Barriers to change are factors that hinder people's ability to change. These include resistance to behaving differently, lack of motivation, fear, and entrenched habits or beliefs. Barriers to change may originate in cultural practices, socioeconomic status, attitudes towards technology, etc. Psychologists study barriers to change in order to understand why people do not make changes that would benefit them or others.

By identifying and treating barriers to change, psychologists try to encourage more effective responses to help bring about positive changes to improve people's lives. Barriers to change are challenges in research and clinical practice: they hinder people's efforts to behave in better ways or to increase the quality of their lives.

Prevalence

Prevalence refers to the proportion of people from a population who behave in a certain way or exhibit certain characteristics or conditions. For example, the prevalence of depression is the percentage of people in the population who meet diagnostic criteria for depression. Prevalence rates are used to determine the extent of a behavior or condition within a population. They are useful for understanding the scope and effect of mental health issues, and so they inform planning for treatment. Prevalence rates show the extent to which change occurs in a behavior. Therefore, prevalence is a basic metric in both research and clinical practice, giving information about the distribution and magnitude of conditions and behaviors.

Longitudinal and repeated measures designs

Longitudinal and repeated measures designs are research methods used to study changes in individuals or groups. In **longitudinal design**, data is collected about the same participants at different times. **Repeated measures design** measures the same variables within participants but across different conditions or at different times. For example, in a longitudinal study of the effects of mobile phone use on academic achievement, researchers would assess the same group of school students at different stages of their time in school. In a repeated measures design on the same topic, researchers might examine students' academic achievement before and after they use mobile phones in school.

Longitudinal and repeated measures designs allow researchers to investigate changes in behavior over time. By collecting information about people's behavior at different times, researchers can identify patterns of behavior, identify causal factors and assess the effectiveness of treatments. Therefore, longitudinal and repeated measures designs are useful tools in research and clinical practice for observing and understanding change, including human development. Both designs give insights into psychological phenomena and so can inform intervention and treatment strategies.

Intervention, prevention and promotion strategies

Intervention, prevention and promotion strategies can address behavioral issues, enhance people's quality of life and prevent the development of mental health issues. For example, an intervention strategy might include CBT for people with anxiety to reduce their symptoms and improve their coping skills. Prevention strategies might include establishing a school-based program to teach stress-management techniques and resilience-building. Promotion strategies might include promoting positive mental health and well-being in community-wide campaigns, encouraging prevention, care and peer-support strategies. Therefore, intervention, prevention and promotion strategies play a critical role in psychology research and clinical practice by offering a range of approaches to addressing mental health concerns and promoting well-being to reduce the effects of mental illness, so improving the quality of life for people and their communities.

TOK

Prevalence raises TOK questions about certainty and accuracy. How might psychologists determine to any degree of accuracy the prevalence rate of a behavior in a population?



Prevalence connects to the context of Health and well-being.

TOK

To what extent should governments engage in strategies to change a population's behavior, such as stopping cigarette smoking, limiting unhealthy eating behavior or promoting participation in sports and physical activity?

Effectiveness of treatment

The effectiveness of treatment refers to the extent to which a therapeutic intervention leads to a desired outcome – that is, to what extent the treatment reduces or eliminates psychological issues, symptoms and disorders. For example, researchers could assess whether participants who received CBT showed reductions in anxiety symptoms compared with those in a control group. Psychologists use many research methods, including randomized controlled trials and longitudinal studies, to determine the effectiveness of treatments. Outcome measures can include changes in the severity of symptoms, improvements in the person's functioning and the person's own opinion of the intervention's effectiveness. Therefore, determining the effectiveness of treatment interventions can determine the effect of therapy on psychological issues and the promotion of well-being. By identifying effective treatments, psychologists can make evidence-based decisions for people needing mental health support.

Development and maturation

Development and **maturation** refer to the growth, change and improvement that people experience during their lives, including cognitive, emotional, social and physical development.



In infancy, development and maturation involve stages or milestones such as learning to crawl, walk and communicate. During adolescence, development includes cognitive changes such as the ability to think abstractly, to reason, to create a unique identity and to feel intense emotions.

Psychologists study development and maturation to understand the common behaviors that all people experience during their lives, as well as the variables that affect growth and change. They investigate and try to explain how biological, cognitive, emotional and environmental factors interact to shape people's developmental paths. Therefore, development and maturation are basic psychological concepts that describe the growth processes that people experience.

Determinism

Determinism is the belief that all behavior is the consequence of underlying factors, either biological or environmental, that can be understood. For example, biological determinism assumes that genetic predispositions and physiological processes

affect a person's behavior and characteristics. Environmental determinism assume that environmental factors such as a person's upbringing, social interactions and cultural influences cause their behavior. For example, determinists believe that academic achievement can be explained by physiological factors such as genetics or by environmental factors such as the school culture and the encouragement of teachers. Biological determinism emphasizes physiological factors environmental determinism emphasizes the effects of external factors such as an individual's socioeconomic status and cultural background. Therefore, determinism explains behavior as the product of biological or environmental rather than other factors. Understanding the interaction between biology and environment can explain the reasons for behavior and changes in behavior.

Activity 6

Humans are resistant to change. It is much harder to change something once it is embedded than it is to introduce something new. Think about your favorite brand of cola, for example. What would it take for you to start buying a new brand? Alternatively, when a new type of soft drink comes out, it is easier to think positively about it without it changing your existing preferences. Perhaps you also have a favorite type of sparkling water, sports drink or komboucha, while still having your favorite cola. Can you think of other areas of life where this applies? Think of some situations where it is easier to like something new if it doesn't "compete" with something you already like. For instance, you join a youth club and make a new "best friend". Would this person have been your best friend if you had met them in school alongside your older friends?

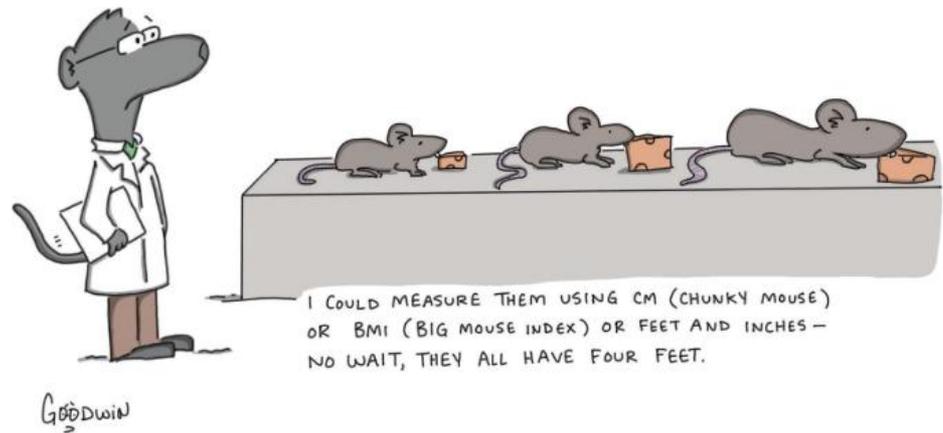
Agency and motivation

Agency refers to a person's ability to make choices and take action to achieve desired goals. Motivation refers to the cognitive processes that generate behavior toward specific outcomes. For example, a high school student with strong agency may seek out situations for improving their grades such as asking for extra homework, attending enrichment classes and setting high goals. Those with low agency might wait for opportunities for improvement to present themselves. Those with high motivation would devote considerable energy to attending classes, actively participating in lessons, creating comprehensive study notes and completing practice/homework activities, while those with low motivation would be unlikely to do any of these. Agency and motivation are significant factors in generating change. Agency seems to be an attitude, while motivation seems to be a cognitive process. They both empower people to initiate and then sustain effort toward achieving outcomes.

Activity 7 (CAS)

Describe how your knowledge of agency and motivation can help you and your classmates in your individual CAS journeys. Design a persuasive poster/wallchart that makes use of your knowledge of agency and motivation to drive a small, simple change in behavior in your school, perhaps relating to playground or corridor behavior, behavior in a cafeteria, or behavior on school buses.

Measurement



Conceptual question

To what extent does being able to *measure* a behavior or a variable define its validity in psychology research? Can phenomena that cannot be measured contribute to research into human behavior?

Different types of methodologies raise TOK questions about accuracy and certainty. They also raise questions about to what extent the methods used to gain knowledge in the human sciences can be considered “scientific” and whether a scientific approach is the best way to investigate human behavior.

TOK

Measurement in psychology means quantifying behavior. **Surveys**, observations and physiological measurements can be used to gather data. By operationalizing variables and using objective measuring techniques, researchers can obtain valid and reliable measurements. **Triangulation**, which means using several types of measurement, improves the credibility of research (Figure 1.6).

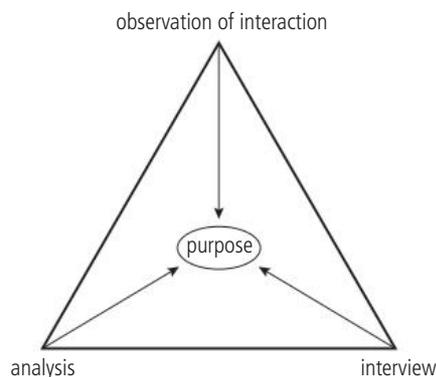


Figure 1.6 An example of triangulation in research.

Concept-related terms

Evidence

Evidence is the term used to describe the data or information gathered by researchers and clinicians to assess changes related to behavior. Evidence can be in several forms, such as anecdotal reports, empirical studies or **self-reported data**. Data may

be quantitative, which means it involves numerical measurements, or qualitative, meaning it focuses on subjective descriptions and interpretations of behavior. Understanding the strengths, weaknesses and limitations of different types of evidence and how they can be measured is important for valid and reliable measurements.

Techniques to measure variables

Measurement involves using a range of techniques to gather data. These techniques include direct methods such as questionnaires and indirect approaches such as brain imaging. Both direct and indirect methods allow researchers to gather data to analyze statistically or to infer relationships between variables. Understanding the strengths and limitations of the methods is crucial for accurate assessment and interpretation of psychological phenomena.

Activity 8

Can emotions such as happiness, sadness or fear be measured/quantified? If so, how? Discuss your thoughts with your classmates.

Choice of research method

The choice of research method means selecting the best approaches and techniques to collect data and measure behavior-related variables. Each research method gathers data in different ways, and each has strengths and limitations.

- **Experimental method:** The experimental method involves manipulating one variable and observing the effect that has on another variable (the behavior). For example, a researcher might conduct an experiment to determine the effect of background music on memory recall by randomly assigning participants to either a quiet room or one with background music and then measuring the effect on memory recall.
- **Observational method:** The observational method involves systematically observing and recording behavior in non-laboratory/real-life settings. For example, a researcher might conduct an observation to study adolescents' mobile phone use to understand the extent to which phones distract students in lessons.
- **Survey method:** Surveys involve gathering self-reported data from participants using questionnaires. For example, a survey might be created to assess levels of stress among high school students.
- **Correlational method:** Correlational studies (**correlational research**) examine the relationship between two or more variables but without manipulating them. For example, a researcher might use this method to determine if there is an association between social media use and feelings of loneliness among adolescent students.
- **Interviews:** These can be **structured** using a set of questions, **semi-structured** or in a **focus group** where participants react to one another.

Constructs and variables and the operationalization of variables

Constructs are abstract concepts that researchers try to study, such as intelligence, personality traits and depression. Variables are measured aspects or dimensions

TOK

The different forms of evidence raise questions about how they help or hinder understanding of human behavior. For example, how does the use of numbers, statistics, **graphs** and other quantitative instruments affect the way knowledge in the human sciences is valued? To what extent can the human sciences use mathematical techniques to make accurate predictions?

of constructs that can be quantified. **Operationalization** includes defining and specifying how constructs and variables will be measured in a study, allowing abstract concepts to be translated into observable and measurable indicators. For example, if a study investigates the construct of anxiety, it may be operationalized by measuring variables such as heart rate, blood pressure, self-reported feelings of nervousness, or performance in an anxiety-provoking activity. These variables generate observable and measurable quantities of the anxiety construct.

Operationalization ensures that constructs are accurately measured and that research results are valid and reliable. It involves describing a study's procedures, the instruments used to measure variables, and the criteria for quantifying data. Operationalization enables researchers to ensure consistent measurements in different studies and improve the replicability of findings. Constructs and variables are basic psychology concepts that require operationalization for measurement to translate abstract constructs into objective, measurable variables, allowing the systematic study of behavior.

Activity 9

Can we measure psychological constructs like love, depression or aggression? How do we go about doing this when we all have such differing experiences of these constructs? One approach is to build a scale or progression. It might sound unfeeling to place things you love on a progression, but it can be a helpful exercise. For example, if somebody loves chocolate, loves Rome after visiting it on a holiday and loves their mother, these three things can all be true, and the individual's amount of love for these three things could be placed on a scale. Can you think of five things that you love and then place them on a scale indicating how much you love them? What about a progression – can you write a sentence for each that explains why you have assessed your love for that thing at the level you have placed it?

Types of data (self-reported, anecdotal, empirical)

Self-reported data is collected directly from people through questionnaires, surveys or interviews. For example, a researcher could use a self-reported questionnaire to investigate perceptions of exam anxiety in a sample of high school students.

Anecdotal data arise from personal accounts or observations of experiences. For example, a researcher might gather anecdotal data from high school students to understand their personal, subjective perspectives of exam stress.

Empirical data are obtained through controlled experiments or observations based on objective evidence. For example, a researcher might use an observation to study parent–adolescent interactions in a laboratory setting, to collect empirical data on attachment.

Self-reported data generate insights into people's subjective personal experiences and perceptions but can be distorted by biases or inaccuracies. Anecdotal data offer detailed information but lack objectivity and **generalizability**. Empirical data offer a high level of objectivity and reliability.

Statistical significance

Statistical significance is the probability that an observed change, difference or relationship between variables is not simply due to random chance.

Anecdotal data arise from personal accounts or observations of experiences. In psychology, these can come from the researcher's own experience. This raises questions regarding to what extent it is legitimate for a researcher to draw on their own experiences as evidence in their investigations in the human sciences.

TOK

Statistical significance is determined by statistical tests, for example, ANOVAs (analysis of variance) or **t-tests**. These tests calculate the probability of generating a study's results if the null hypothesis were true.

Type I and II errors

A **type I error** occurs if the researcher incorrectly rejects the null hypothesis when it is actually true. An example of a type I error is concluding that a treatment to reduce anxiety is effective when it has no effect on anxiety. A **type II error** occurs when a researcher does not reject the null hypothesis when it is false. A type II error would occur if a treatment is considered ineffective when it really is effective. An example of a type II error is a researcher failing to find a significant difference between a new and an old teaching method when in reality the new method is less effective. This type II error could occur if the sample size is too small or if the researcher applied a statistical test that did not detect the true difference.

Type I errors are sometimes called false positives; the researcher concludes that there is an effect when there is not. Type II errors are sometimes called false negatives; the researcher does not conclude that a real effect was observed.

Brain imaging techniques

Brain imaging techniques see and measure the brain's structure and function. It allows researchers to observe neural activity and changes in brain regions.

- PET (positron emission tomography): During PET scans, a radioactive tracer is injected into the bloodstream. Positrons are emitted and detected by the scanner. PET scans can measure blood flow, glucose metabolism and neurotransmitter activity. For example, PET scans can be used to observe, measure and study cerebral activity during periods of anxiety or depression.
- CAT (computerized axial tomography): CAT scans use X-rays to create cross-section images of the brain to detect structural abnormalities such as brain injuries. For example, CAT scans are used to diagnose traumatic brain injury or stroke.
- MRI (magnetic resonance imaging): MRI uses powerful magnets and radio waves to generate high-resolution images of brain tissue to present detailed information about brain anatomy. For example, MRI scans are used to visualize changes in brain structure due to neurodevelopmental disorders such as autism.
- fMRI (functional magnetic resonance imaging): fMRI measures changes in blood oxygen levels, which indicates neural activity. fMRI scans allow researchers to identify brain regions associated with cognitive tasks. For example, fMRI studies are used to investigate correlations associated with thinking, decision-making and emotions.

Visualizing brain structures and neural activity allows researchers to study how psychological processes occur in the brain and to identify biological indicators of various mental health conditions. PET and CAT scans, MRI and fMRI are valuable, objective tools for studying brain function and structure in psychology.

Interpretive approaches (content analysis)

Interpretive approaches involve analysing qualitative data to reveal underlying meanings and themes in text or visual content. **Content analysis** is an interpretive

TOK

There are often disagreements regarding the definition of research methods and data collection methods. Can scans/images be considered research methods, or are they data collection methods? The distinction often depends on how the tool is used. If scans or images are employed as a means to directly gather raw data for analysis, they are typically considered data collection methods. However, if they are part of a broader framework that includes the rationale and procedures for how the data will be collected, analyzed and interpreted, they could be seen as components of a research method. Ultimately, the context of their use often dictates how they are classified.

Interpretive approaches involve analysing qualitative data to reveal underlying meanings and themes in text or visual content. However, they can be considered more open to researcher influence and therefore raise questions about whether more standardized methods such as observations and experiments should be the only two ways in which human scientists produce knowledge.

TOK

method for examining written, verbal or visual content. Instead of quantifying variables, interpretive approaches try to understand subjective experiences and perspectives embedded in the data. For example, researchers could investigate interview and focus group transcripts or social media posts to identify themes or discourses on a topic, such as attitudes toward anxiety disorders. By investigating the data's language, symbols and context, researchers can gain insights into people's beliefs, attitudes and culture.

Interpretive approaches give researchers a deeper understanding of complex behavior that cannot be understood with quantitative approaches. Interpretive approaches such as content analysis complement quantitative methods to give researchers a more nuanced insight into behavior.

Prospective vs. retrospective approaches; longitudinal vs. cross-sectional research designs

Prospective and **retrospective research**, and longitudinal and **cross-sectional research designs**, are used to study changes in variables over time. Prospective approaches collect participants' data in a future period; retrospective approaches gather data from past records or individuals' recollections.

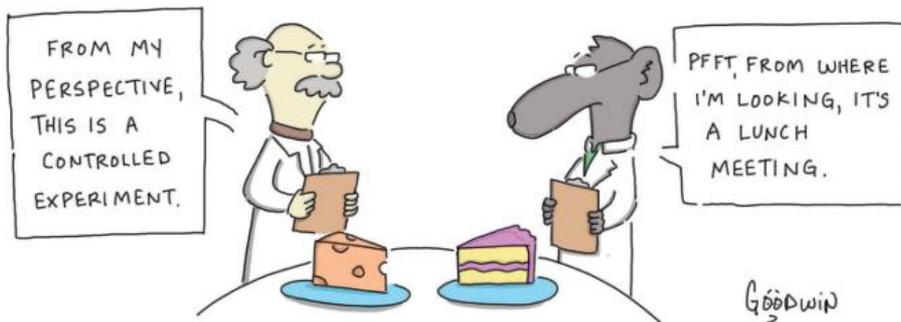
Longitudinal research studies the same participants over a long period of time, while cross-sectional designs compare different groups of participants at one time. For example, a prospective longitudinal study might monitor cognitive development in children from infancy through to adolescence by assessing cognitive abilities at regular intervals over the research period. A retrospective cross-sectional study would examine the relationship between variables, for example, childhood experiences and adult mental health, by comparing participants' retrospective reports of adult mental health with and without childhood trauma.

Prospective approaches let researchers observe changes in variables over time to provide insight into development and causal relationships. Retrospective approaches allow researchers to study behavior that cannot be observed prospectively (example, childhood experiences). Prospective and retrospective approaches, as well as longitudinal and cross-sectional research designs, are complementary methods for measuring change.

Issues of reliability are often considered in the human sciences as they lead to questions regarding accuracy and certainty. To what extent can interviews about childhood experiences be considered reliable, as well as producing accurate knowledge?

TOK

Perspective



Conceptual question

If different *perspectives* provide unique lenses on human behavior, to what extent can we objectively consider one perspective as more valid than another? Can someone's perspective be considered invalid, incorrect or wrong?

Perspective refers to the viewpoint from which behavior is understood, and encompasses theoretical approaches that influence how psychologists interpret phenomena. Different perspectives offer different lenses for studying and understanding behavior. These include the biological, cognitive and sociocultural approaches, each of which emphasizes different aspects of the human experience. For example:

- the biological approach emphasizes physiological factors such as genetics and hormones
- the cognitive approach emphasizes mental processes such as thinking and decision-making
- the sociocultural approach emphasizes the influences of family, community and culture on behavior.

Psychology utilizes several different perspectives to explain behavior.

Activity 10 (CAS)

Create a one-page graphical image in your notebook that displays the three perspectives described above with regards to one behavior, for example, anxiety, depression or memory. Can you think of other perspectives from which to consider or explain behaviors?

Concept-related terms

Psychological theories and models

Psychological theories and models are abstract frameworks used to explain and understand aspects of behavior. A **theory** is a proposed and testable explanation, and a **model** is a suggested description of a structure or process. Theories and models give psychologists organized concepts to guide research and clinical practice. When studying behavioral phenomena (for example, memory), psychologists use theoretical perspectives to try to understand and explain underlying structures and processes (for example, those involved in encoding, storing and retrieving memories).

For example, reconstructive memory is a theory that attempts to explain how memories are recalled – instead of a “replay” of an event, the theory of reconstructive memory proposes that fragments of recalled events are reconstructed into a larger memory. The Levels of Processing model (Craik and Lockhart, 1972) is a model that emphasizes the significance of depth of processing in memory formation. According to the model, information is more readily recalled when it has been processed deeply and semantically, rather than superficially or structurally.

To illustrate this, consider a three-tier wedding cake (Figure 1.7). Each tier represents a different level of processing.

The top level of the cake looks pretty and extravagant; it is all about appearance, which might be considered “shallow”.

At the middle level of processing (the middle tier), the cake might be described (its physical characteristics, its ingredients and flavors, its construction) using written or spoken language – a phonetic representation of the cake.

At the deepest level of understanding (the bottom tier), the cake might be described in terms of the lasting impression it makes, the emotional feelings of satisfaction it creates, and of the occasion that the cake represents – the lasting memory of the experience. This is a person’s deepest meaning of the cake.



Figure 1.7 A three-tier cake representing the Craik and Lockhart study.

Activity 11

Imagine you are at a party and you have just been introduced to someone called Anthony Farmer. You start chatting with Anthony and then one of your friends comes up to you. It is polite to then introduce your friend to your new acquaintance . . . but can you remember his name? It was probably in your short-term memory for a while, but processed at a very shallow level, but then the new information you were chatting about interfered with your memory system remembering his name. Now imagine you were introduced to A. Farmer . . . your mind instantly builds a picture of someone dressed in a particular way, perhaps riding a tractor while ploughing a field. A vivid mental image such as this is easier to recall when you need to remember your new acquaintance’s name because such images are processed at much deeper levels. Turning “A. Farmer” into “a farmer” is an effective sure way to increase the level of processing of new information and your likelihood of being able to recall new information.

Psychological theories and models are tools used to simplify and clarify complex phenomena such as memory. Through theoretical frameworks, such as the theory of reconstructive memory and the Levels of Processing model, psychologists can investigate and understand the processes underlying memory formation, retention and recall.

Deductive and inductive research

Deductive and **inductive research methodologies** are contrasting approaches used to generate new knowledge and conclusions. Deductive research moves from general principles to specific hypotheses and predictions. It starts with a theoretical model or theory and tests hypotheses through empirical observation. Inductive research moves from specific observations to general principles or theories based on those observations.

Activity 12

Academics use the notion of robustness as a way to measure how strong a theory is. Research a psychology theory that is considered robust and compare it to a theory that is considered less robust. Which variables influenced the perception of the robustness of the theories? On what basis are they considered robust and not robust?

A deductive researcher would first create a hypothesis based on an existing theory or model. For example, a deductive researcher interested in the effects of social media on adolescent well-being might begin with a hypothesis such as: “excessive social media use is associated with higher levels of anxiety and depression among teenagers”. They would then test that hypothesis through observation.

An inductive researcher would start with observations and data and then try to identify patterns or trends within the data. For example, through interviews with adolescents, the researcher might identify patterns of social media use and their effect on teenagers’ mental health, which could lead to new and unexpected insights.

A deductive researcher would start with an existing theory or model and design a research study to test hypotheses related to it. For example, a researcher could begin with a theory about the effect of sleep on cognition and then conduct an experiment to test if participants who sleep less perform worse in memory-related activities and so generate evidence that supports or refutes the theory.

Activity 13

There is a theory that high attendance in a class will result in a high final grade for that class. How might you use inductive or deductive reasoning to test this theory?

Identify at least two theories of behaviors that demand to be tested inductively, and at least two others that demand to be tested deductively.

Emic and etic perspectives/approaches

Emic and etic perspectives are complementary approaches to studying and understanding cultural aspects of behavior. The **emic perspective/approach** examines behavior from within a culture, using an insider’s perspective. The **etic perspective/approach** analyzes behavior from an outsider’s viewpoint, applying universal, cross-cultural principles and concepts to identify similarities and differences in behavior. A psychologist adopting an emic approach to studying depression within a cultural group would conduct interviews and observations within that culture to understand how people within the community experience depression. The emic approach emphasizes cultural beliefs and practices that affect the depression experienced within that culture. A psychologist using the etic approach to investigate the prevalence of depression across different cultures would likely administer standardized measures and compare the results across cultural groups. The etic approach tries to identify cross-cultural elements of depression while acknowledging that depression can manifest differently in different cultures.

Emic and etic perspectives should be seen as complementary rather than alternative approaches. The emic approach creates an understanding of a cultural phenomenon by investigating behavior in its specific cultural context, while the etic approach generates a comparative study of behavior across cultures. Emic and etic perspectives

are valuable to research in psychology because they offer different lenses through which to understand behavior in its cultural context. The emic approach emphasizes insider perspectives; the etic approach emphasizes cross-cultural comparisons. By using both perspectives, researchers develop a more comprehensive understanding of the interplay between culture and behavior.

Perspectives of Indigenous societies

The perspectives of **Indigenous societies** refers to the unique cultural, spiritual and historical viewpoints they hold. These perspectives acknowledge diverse understandings of behavior shaped by Indigenous knowledge systems, traditions and experiences. Recognizing and valuing Indigenous perspectives creates culturally responsive and ethical research, clinical practice and treatments that respect Indigenous people's views of the world and promotes Indigenous self-determination and empowerment. For example, Indigenous perspectives in psychology may involve collaborating with Indigenous people to develop research strategies or clinical treatments that are consistent with Indigenous communities' values and beliefs. This could incorporate traditional healthcare practices (Figure 1.8), storytelling and community-based approaches to mental health support for Indigenous populations.

By respecting Indigenous perspectives, psychologists can benefit from Indigenous knowledge and healthcare practices to address the unique mental health needs of Indigenous peoples.

Indigenous perspectives offer insight into behavior supported by a long history of Indigenous knowledge and experience. These perspectives often emphasize an interconnectedness with nature and other people, stressing a holistic approach to health that encompasses physical, mental and emotional dimensions. Acknowledging and respecting Indigenous perspectives promotes cultural humility, equity and social justice.

Alternative explanations and interpretations

Psychology is open to alternative hypotheses or perspectives that may offer different ways of understanding behavior. Being open-minded toward alternative explanations is necessary for scientific inquiry and **critical thinking** because it prompts researchers to investigate different perspectives and hypotheses before making conclusions. For example, when investigating the links between social media use and mental health, researchers may hypothesize that high levels of social media use creates greater feelings of loneliness. However, alternative explanations could include reverse causality (lonely people may use social media more than people who are not lonely) or third variables (for example, personality traits may affect both loneliness and social media use).

Investigating alternative explanations of behavior helps researchers to test the robustness of their findings and identify confounding variables. It promotes skepticism and intellectual rigor because, by considering different perspectives and variables, researchers can strengthen the validity and reliability of their research and avoid oversimplifications. Acknowledging alternative interpretations promotes humility and open-mindedness and encourages researchers to be open to new evidence and to refining existing theories.



Figure 1.8 A man selling natural medicines from his stall in Lima's Mercado Central, Peru.

Do researchers have an inherent right, or even an obligation, to study the behavior of Indigenous people?

TOK

To what extent would you be willing to participate in research conducted by someone from an Indigenous group, using methods unique to their culture?

How do we balance respecting cultural perspectives with scientific rigor in interpreting behavior? For example, in Haitian Vodou, behaviors like possession and trances are understood as spiritual connections, but scientific psychology would interpret them as altered states of consciousness.

TOK

Responsibility



Conceptual question

In collectivist cultures, in which the well-being of society, including future generations, is very highly valued, does the potential social benefit justify harming individual research participants? Does the principle of “do no harm” hinder the aim of developing knowledge that could benefit society?

Responsibility refers to the moral obligation to carry out research with integrity and with consideration and compassion for all stakeholders’ well-being. This requires adhering to ethical guidelines, ensuring research validity and eliminating the risk of harm. Psychologists conduct research with human and animal participants, emphasizing respect and ethical treatment, and prioritizing informed consent, confidentiality, anonymity and voluntary participation in human research. For example, in a study that investigates the effects of social media on adolescents, researchers would gain informed consent and ensure confidentiality and anonymity. In **animal models**/research, considerable effort is made to eliminate the risk of harm, by using fewer animals, for example, or using alternatives such as computer modeling whenever possible. In animal research into addiction, researchers use techniques that minimize harm, such as non-invasive procedures. Psychologists conduct ethical research by promoting integrity and compassion and by prioritizing respect and minimizing harm, which contributes to responsible scientific inquiry.

Concept-related terms

Ethical principles

Ethical principles are frameworks that guide the priorities and decisions of psychologists and researchers. Their aim is to prioritize participants’ welfare while maximizing benefits to the psychology community. Ethical principles shape research practices by influencing the choice of research topic and the design and procedure of studies. Ethical principles apply to all aspects of research including informed consent, participant

TOK

Why do some communities of psychologists impose ethical constraints on their work, while others do not? To what extent are the methods used in the human sciences limited by the ethical considerations involved in studying human beings?

TOK

Are codes of ethical conduct for researchers required in countries that have robust and effective legal systems? For example, do researchers have different ethical responsibilities when they are working with human subjects compared to when they are working with animals?

rights, confidentiality and anonymity. In a study examining the effect of alcohol consumption on aggression for example, researchers would obtain informed consent from participants, ensuring they understand the study's purpose and procedures and any risks. The right to withdraw is made available to participants, minimizing the risk of coercion. Anonymity in data collection protects participants' privacy and allows for frank and honest responses that increase the data's reliability and validity.

Ethical principles safeguard participants' rights and well-being by ensuring beneficence, nonmaleficence, autonomy and justice, while fostering trust and accountability within the psychology community. Therefore, ethical principles serve as foundational guidelines for psychologists and researchers in psychology, shaping their conduct and decision-making processes in their research practices.

Ethical considerations

Ethical considerations evolve in response to society's changing norms and values. Psychologists recognize their responsibility to conduct research ethically, which includes applying research findings responsibly. This means safeguarding stakeholders such as participants, researchers and users of published research. For example, in a study investigating the effectiveness of a new intervention for reducing anxiety symptoms, psychologists would prioritize transparency by communicating the limitations and uncertainties associated with the intervention's outcomes.

Ethical researchers advocate for government and organizational policies that prioritize mental health support using empirical evidence. Ethical considerations include responsibility for social advocacy and awareness-building because psychologists understand that they have influence in shaping public perceptions of behavior and can play a proactive role in promoting justice and equity through ethical action. Ethical considerations in psychology reflect ongoing efforts to uphold principles of integrity, respect and justice in research. Psychologists have ethical obligations to apply research findings ethically and to advocate for change informed by empirical evidence.

Ethical standards

Ethical standards in research ensure that the rights and well-being of stakeholders are protected. They apply to many research considerations, including the use of deception, obtaining informed consent, conducting **cost–benefit analyses** and **harm–benefit analyses**, ensuring anonymity, providing debriefing, respecting participants' right to withdraw and mitigating potential harm. For example, in a study investigating the effects of obedience, researchers apply ethical standards by obtaining participants' informed consent, ensuring the participants understand the study's purpose and procedure, and any risks associated with participation. To ensure anonymity, participants are assigned identification numbers to protect their privacy. Ethical standards give researchers a framework to conduct studies responsibly, prioritizing the well-being and rights of all stakeholders, including participants, researchers and users of the research's conclusion.

Use of animals

Using non-human animals in research requires ethical standards because it is accepted that non-human animals feel pain and so can experience harm. Therefore, researchers are expected to protect animals from harm by ensuring their welfare and safety.

Ethical considerations evolve in response to society's changing norms and values, and they may be seen as helping or hindering how psychology researchers collect data. To what extent are the methods used in the human sciences limited by the ethical considerations involved in studying human beings?

TOK

Activity 14

Conduct a debate, with one side arguing in favor of an outright ban on the use of animals and the other side arguing that the benefits of animal use in research outweighs the costs. Discuss whether *any* animal research can be considered ethical, given that the animals are housed in artificial/unnatural conditions.



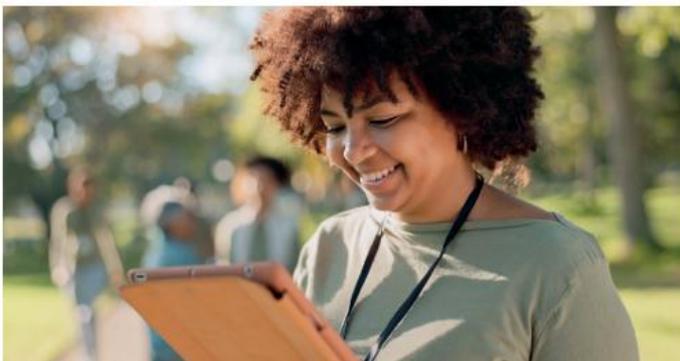
Research using child participants

Psychologists often want to conduct research with child participants, for example, to study development, learning and social interaction. The main difficulty associated with child participants is that they are not sufficiently mature to give fully informed consent, so this must be obtained from a parent/guardian. For example, if children are to be participants in a study relating to mobile phone use, the children's parents must give consent on their children's behalf and be made aware of all ethical considerations.

Research in public spaces, including observation-only research

Research in public spaces, including observation-only studies, refers to the systematic gathering of data in environments that are accessible to the general populace.

Typically, participants' informed consent is not obtained in such research because if they knew they were being observed, they would likely behave differently. For example, a researcher might conduct observation-only research in a recreation park to study social interactions between different age groups by **covert observation** of behaviors, conversations and interactions without interacting with the participants. Using this method, researchers can observe naturally occurring behavior in its typical setting, providing insight into human behavior beyond a controlled setting (Figure 1.9).



◀ **Figure 1.9** There are significant ethical issues associated with observation-only research in public spaces, including the invasion of privacy. Researchers must ensure that participants' identities and personal information remain confidential.

Activity 15

Conducting observational research in public spaces is a widely used method in psychological research. Imagine you were setting up a study to observe the different communication styles used by elementary school students in the playground. What are some of your responsibilities as a researcher when conducting a study like this?

In summary, ethical considerations in psychological research are varied and complex. Researchers must navigate these complexities with sensitivity and diligence, prioritizing the welfare and rights of all individuals involved. By adhering to ethical guidelines, psychologists uphold the integrity of their research and contribute to the advancement of knowledge in an ethical and responsible manner.

Activity 16 (CAS)

If animal and child research are considered unethical because animals and children cannot give fully informed consent, should covert observations also be considered unethical? Discuss with your classmates.

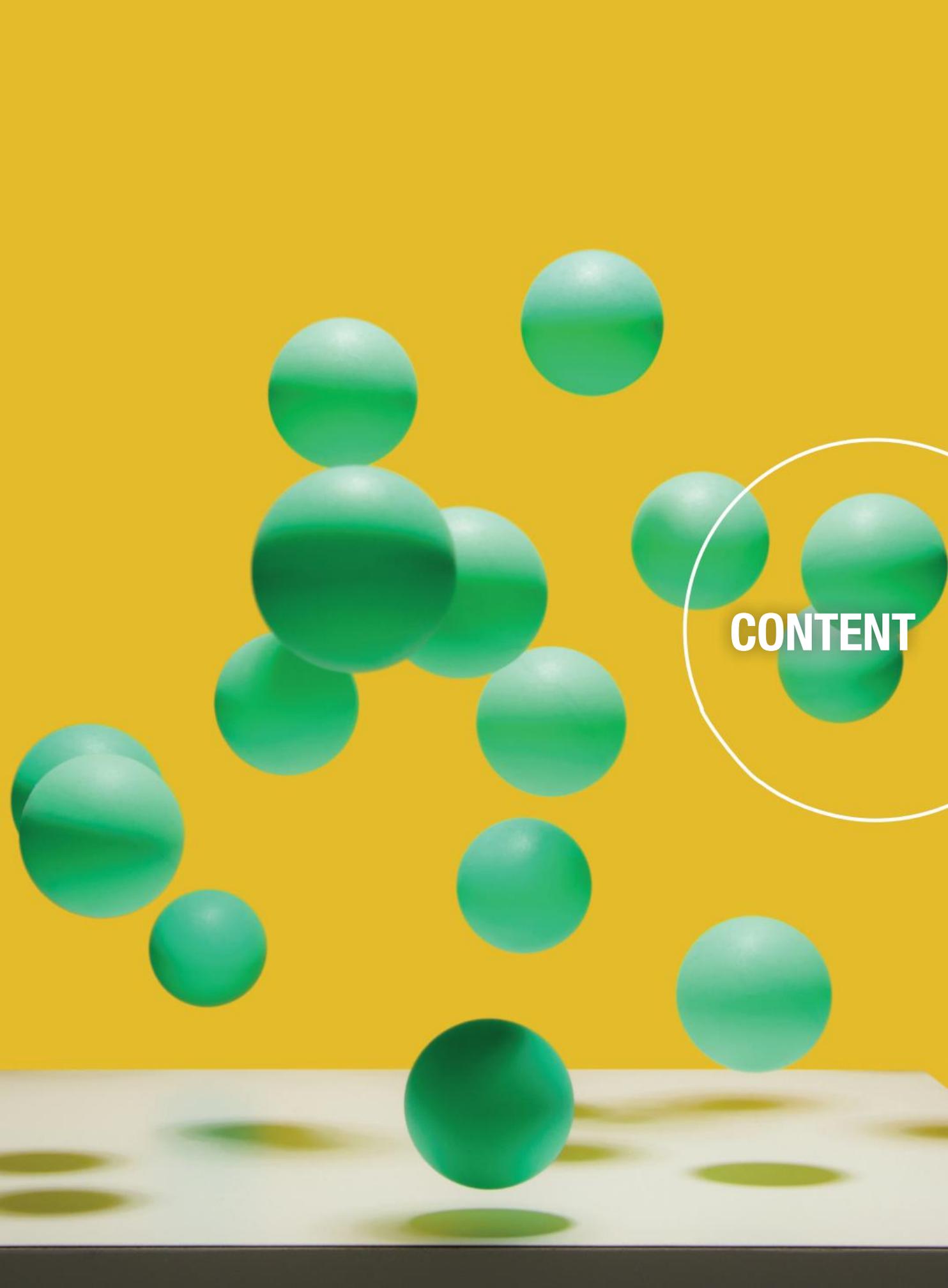
Can Indigenous people, for example, give fully informed consent?

Socially sensitive issues: stigma, publication of findings and advocacy

Psychology research is often conducted on socially sensitive issues, including those prone to stigma, discrimination and strong emotional responses. **Stigma** is a negative stereotype that society attaches to a characteristic or behavior, sometimes resulting in discrimination. For example, many societies stigmatize those who misuse illegal drugs. Socially sensitive topics, such as religion or mental health, can differ in different cultures.

Responsible researchers and journal editors publish the results of socially sensitive research with great care ensuring that participants' anonymity is protected and that all of the data remain confidential. Engaging with socially sensitive issues requires eliminating the risk of harm. This includes carefully considering how findings are published to prevent stigmatization and using results to advocate for meaningful change.

Advocacy means actively supporting the people who are the subject of the research, with the aim of influencing policies and social attitudes, and acting for positive change toward social justice. An example of advocacy in research is a study on the effects of homelessness on mental health during which the researchers actively collaborate with homeless communities to collect data on their everyday experiences, such as access to mental health treatment. After the research is completed, the researchers advocate for change by presenting the study's findings to a local government, requesting that it make mental health services more accessible to the homeless community, thereby working to improve the well-being of homeless people.

The image features a vibrant yellow background with numerous green spheres of varying sizes scattered across it. Some spheres are positioned as if they are resting on a white surface at the bottom, casting soft, circular shadows. A white circle highlights a specific green sphere on the right side of the image. The word "CONTENT" is written in a bold, white, sans-serif font, positioned to the left of the circled sphere.

CONTENT

Learning objective

You should be able to understand how psychological terminology and theories related to biological, cognitive and sociocultural approaches assist to understand human behavior, while using a variety of research methodology.

- Biological approach
- Cognitive approach
- Sociocultural approach
- Research methodology

Introduction to content

The DP Psychology course explores the biological, cognitive and sociocultural approaches, along with the research methods used to understand human behavior. While these approaches are often studied individually, you are encouraged to recognize the overlaps and interactions between them. Examples include genetic predispositions influenced by environmental factors, cognitive biases shaped by sociocultural experiences, and epigenetic changes caused by environmental influences. This section covers four main areas: the biological, cognitive, and sociocultural approaches, as well as the research methods used to study human behavior.



Biological approach

Psychological terminology	Learning objective
Animal research/animal models	The value of animal research in the study of human behavior and the ethical considerations in the use of animals in research.
Biological reductionism	The strengths and limitations of a reductionist approach to the study of behavior.
Brain imaging techniques	The value of using one or more brain imaging techniques in investigating human behavior.
Chemical messengers	The role of one or more chemical messengers in human behavior.
Diathesis-stress model	The interaction of environment factors and genetics in human behavior.
Genetic inheritance	The extent to which human behavior may be inherited.
Localization of function	The role of localization of function in explaining human behavior and cognition, and the limitations of the argument that behavior is localized.
Neuroplasticity	The process of neuroplasticity and the role of environmental factors on brain development.
Neurotransmission	The process of neurotransmission and how an understanding of the process of neurotransmission allows psychologists to improve health and wellness.



Table 2.1 Biological approach learning objectives from Subject Guide, page 24.

Introduction to the biological approach

The biological approach to understanding human behavior has developed from early medical practices to contemporary neuroscience. As early as the sixth century BCE, neurosurgery aimed at alleviating pain by removing brain tumors and fluids, laying foundational concepts for the biological study of human behavior. The nineteenth century witnessed the emergence of phrenology (Figure 2.1), a discipline that, despite later being discredited, emphasized the importance of brain function **localization**. This concept gained empirical support through subsequent research, especially in relation to language, in the late nineteenth and early twentieth centuries.

The technological advancements of recent decades, particularly in brain imaging, have revolutionized the biological approach, enabling non-invasive exploration of brain structure and activity. These advances have deepened the understanding of **neuroplasticity**, the brain's ability to form and reorganize synaptic connections,

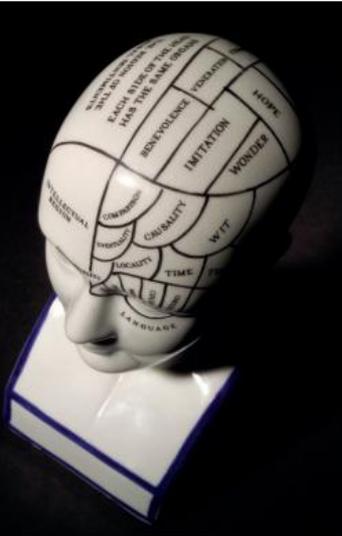


Figure 2.1 A phrenological model skull.

especially in response to learning or experience, as well as gene–environment interactions, particularly through the lens of **epigenetics**, which shows how environmental factors can influence gene expression without altering the DNA sequence itself. Furthermore, the use of animal models, including rodents and primates, has been instrumental in our understanding of the links between neurological structures and behavior, offering valuable insights into human cognition and behavioral patterns. Through these models, researchers can observe the direct consequences of neurological alterations on behavior, providing a more nuanced understanding of the biological underpinnings of human action.



In your assessments, you will be asked to explain or describe a psychological idea or a theory and be expected to provide an example. Make sure you cite a specific behavior and state clearly how it illustrates the idea or theory.

Animal research/animal models

An animal model is a living, non-human, often genetically-engineered animal used during the research and investigation of human behavior. The use of animal models in research eliminates the risk of harming a human being.



The value of animal models



Conceptual question

Animal models allow ease of access to animals' brains and bodies both before and after sacrifice. Do researchers have different ethical *responsibilities* when they are working with human subjects compared to when they are working with animals? If so, on what basis, and which cultural norms should influence ethical standards?

Animal models are used in psychology research on the assumption that the discoveries made will provide insight into the workings of human beings. The value of animal models in research can be seen when they allow for the following.

- The isolation, manipulation and *measurement* of variables, which means there are high levels of internal validity. Therefore, tentative *cause-and-effect* can be shown.
- Ease of access to their brains and bodies both before and after sacrifice. There are ethical and practical restrictions on the use of human bodies in research.
- A relatively quick breeding cycle that allows researchers to study the effects of heredity and environmental factors on behavior.

The use of animal models works on the following assumptions.

- There are similarities between humans and animals because humans are mammals and have been subjected to the same processes of evolution. Therefore, it can be assumed that similar traits have similar adaptive functions in humans and certain animals.
- Animals are an objective research platform to test hypotheses in living tissue. However, animals are also thinking and feeling organisms and respond in subtle and complex ways to their environment and their use in research. For example, Sorge et al. (2014) found that male researchers may cause greater quantities of the stress hormone corticosterone to be released in the mice they handle. The presence of a T-shirt placed with the animals also confirmed the findings, as the animals showed elevated levels of stress if the T-shirt had been worn by a man rather than a woman. The results show how the gender of the person handling the animals can have a significant effect on the biology and the psychology of the animal in the study.

Ethical considerations

Certain underlying ethical assumptions have evolved regarding the treatment of animals.

- It is acceptable to use animals for human ends. However, there must be a clear knowledge benefit.
- The use of animals should be minimized wherever possible.
- Pain and distress should be minimized wherever possible.

The British Society of Animal Science created a set of ethical guidelines for the use of animals in research (known as the “3Rs”).

- **Refinement:** Any animal science research undertaken should be as focused as possible and have realistic and achievable aims. Researchers should avoid causing pain wherever possible.
- **Replacement:** Researchers must consider all available options to replace animals with other techniques that will fulfil the research objectives.
- **Reduction:** Researchers should calculate how few animals are required to ensure that meaningful results can be obtained.

Activity 17 (CAS)

Design a research proposal for a hypothetical animal science study. Ensure that it adheres to ethical guidelines by considering your strengths and limitations in terms of refinement (focused, realistic aims and minimizing pain), replacement (exploring alternative methods to using animals) and reduction (using the minimum number of animals necessary to obtain meaningful results). Discuss how you would implement these principles in your proposal.

TOK

Ethical considerations provide researchers with restraints on what they are allowed and not allowed to research, as well as restraints on the ways in which they conduct research. To what extent are the methods used in the human sciences limited by the ethical considerations involved in studying human beings?

Biological reductionism

Reductionism is an academic approach that breaks down complex behavioral and mental processes into simpler components, often at the level of biological or physiological processes.

The reductionist approach suggests that to understand complex psychological phenomena, researchers should focus on the smallest, most basic elements that contribute to these phenomena, such as genetic makeup, neurotransmitter systems or brain structures.

The strengths and limitations of a reductionist approach

The reductionist approach to the study of behavior has many strengths.

Scientific rigor and precision

Reductionism allows for detailed and precise scientific investigation into the biological bases of behavior and mental processes. It allows for the isolation, manipulation and *measurement* of key variables that can be researched, often singularly, to pinpoint possible mechanisms of cause-and-effect. Therefore, reductionism has implications for *causality*. For example, Davidson et al. (2001) examined the effectiveness of drugs such as sertraline in preventing post-traumatic stress disorder (PTSD) relapse. They knew the variable of serotonin (a neurotransmitter) was important and wanted to see what happened when they manipulated the length of time it would remain active in the brain of PTSD and non-PTSD sufferers. They did this by using selective serotonin reuptake inhibitors (SSRIs), which work by increasing the amount of time serotonin can have an effect in the brain.

Development of treatments

Understanding the biological underpinnings of psychological disorders has led to the development of effective treatments, including pharmacological interventions. By targeting specific biological processes, such treatments can alleviate symptoms of mental health conditions. For example, serotonin is linked to mood and anxiety, therefore medication that acts on the neurotransmitter serotonin can be used to treat mood and anxiety disorders.

Objective measurement

Reductionist approaches often rely on objective, quantifiable *measurement* of biological processes, such as brain imaging or blood tests. This objectivity can enhance the reliability and validity of research findings in the biological approach.

Activity 18

Explore reductionism by breaking down complex behaviors into smaller components across different psychological approaches. Start by selecting a behavior, like anxiety or addiction. Then, in groups, create a diagram with three sections: biological, cognitive and sociocultural. For each section, break the behavior down into specific elements, for example, neurotransmitters for biological, thought patterns for cognitive, and cultural influences for sociocultural. Label which parts of your diagram are reductionist explanations. Finally, discuss whether breaking the behavior down in this way limits your understanding of the behavior as a whole.

You will learn more about this study later in this section (page 49).



Integration with neuroscience

Reductionism has facilitated the integration of psychology with disciplines such as neuroscience and genetics, leading to a more comprehensive understanding of the brain and behavior. This interdisciplinary approach has expanded the knowledge of how biological factors influence psychological processes.



Conceptual question

Reductionism offers a focused *perspective* on biological processes, but what are the strengths and limitations of using this approach to understand complex human behavior?

However, the reductionist approach to the study of behavior also has limitations.

Oversimplification

Reductionism oversimplifies complex psychological phenomena by reducing them to their biological components. Human behavior and mental processes are influenced by a wide range of factors, including environmental, social and cultural factors, which may be overlooked by a purely reductionist approach. Therefore, caution should be used when assuming that complex human behavior can be explained by singular biological variables.

Neglect of context and subjectivity

Reductionism may fail to account for the context in which behavior occurs and the subjective experiences of individuals. Psychological phenomena can be deeply influenced by personal and situational factors that are not easily reduced to biological mechanisms. For example, not all individuals who take SSRIs achieve positive outcomes, which suggests that not all behaviors can be reduced to simple biological mechanisms.

Philosophical concerns

Reductionism raises questions about free will, *responsibility* and the essence of human nature. By attributing behavior and mental states solely to biological factors, reductionism may neglect the role of conscious choice and moral responsibility. It may encourage people to view themselves as being dictated to by biological forces they have little control over, and this may impair treatment or lead to negative behavioral outcomes.

Brain imaging techniques

Brain imaging techniques are non-invasive methods used to visualize the structure and function of the brain, aiding in the investigation of how biological processes influence human behavior.

There are many ways that brain imaging techniques add value in investigating human behavior. For example, PET is a functional imaging technique that produces a multi-colored image showing which parts of the brain are most active during a specific task (Figure 2.2). The color of each dot shows the intensity of the energy signal. PET scans use radioactive substances known as radiotracers to visualize and *measure* changes in metabolic processes and blood flow. PET scanners work by detecting the radiation given off by the radiotracers that have been injected into the body (usually the arm).



See stage theories on page 190 for how this relates to Health and well-being.



Reductionism may neglect the role of conscious choice and moral responsibility in explaining why humans behave the way they do. What are the other main difficulties that human scientists encounter when trying to provide explanations for human behavior?



Conceptual question

Brain imaging techniques allow us to visualize brain activity, but how can we use these methods to accurately *measure* complex psychological constructs such as memory or emotion?

In most PET scans, a radiotracer called fluorodeoxyglucose (FDG) is used. FDG is similar to naturally occurring glucose (a type of sugar), so the body treats it in a similar way by using it for metabolism. The radiotracer collects into areas of the body that have higher levels of metabolic or biochemical activity. When more glucose is used, the radiotracer is detected by the PET scanner. This can be used to show how different areas of the brain are responsible for different behaviors (localization of function).

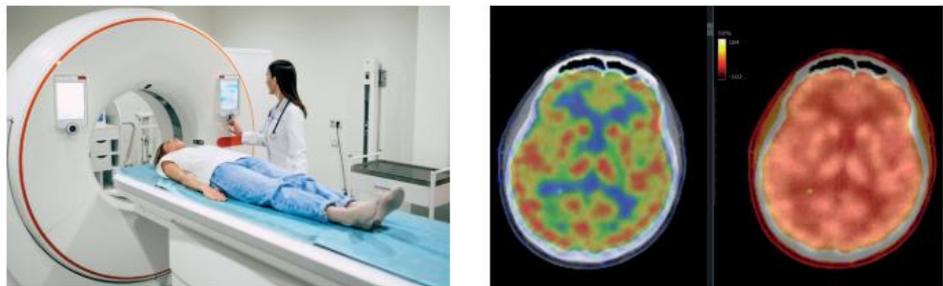


Figure 2.2 A PET scanner and scans.

The value of PET scans is that they allow researchers to study the distribution and density of neurotransmitter systems in the brain, offering insights into the neurochemical basis of behaviors and psychological conditions. By highlighting areas of the brain that consume more glucose, PET scans can identify regions of heightened activity during specific cognitive or emotional tasks, helping to map functions to brain structures. However, it should be noted that brain imaging techniques have limitations. For example, unwanted errors in the images can arise from movement, scanner malfunction or other external factors. These are known as **artifacts**. Artifacts can distort the accuracy of the images, making it difficult to interpret the data reliably. Additionally, brain imaging methods like fMRI and PET scans only provide indirect measurements of brain activity, which means the data needs to be carefully analyzed to ensure valid conclusions. Furthermore, these techniques can be expensive and require specialized equipment, limiting accessibility in some clinical and research settings.

Activity 19

Explore how different brain imaging techniques help in studying human behavior by researching three methods, such as MRI, PET and fMRI. Then, create a diagram comparing these techniques based on their purpose – whether they are used to examine brain structure or function – how they operate, and their respective strengths and limitations. Next, select a specific behavior, such as memory or emotion, and identify which brain imaging technique would be most appropriate for studying it. Finally, discuss how brain imaging provides valuable insights into the biological basis of behavior, while also considering the limitations of interpreting data from these techniques.

Maguire et al. (1997) used 11 right-handed male London taxi drivers to explore the role of the right hippocampus in spatial memory. Using a **quasi-experimental** design, the study measured hippocampal activity through PET scans while participants recalled complex routes and landmarks in London. The results indicated that the right hippocampus was activated during the recall of complex routes but not when recalling landmarks outside participants' spatial knowledge. Maguire et al. concluded that the right hippocampus plays a crucial role in spatial memory, evidenced by its activation in tasks requiring navigation and memory of complex spatial routes. This study shows a further clear value of PET scans: they allow for the brain to be scanned while the participants are engaged in an activity. For example, Maguire et al. were able to ask participants to recall complex routes around London and then *measure* the response of key brain areas. This means a clear correlation between the task and the brain region can be established.

TOK

Brain imaging techniques may provide a valid way to measure behaviors such as memory. However, they raise questions about whether human behavior can be objectively measured.

Chemical messengers

Chemical messengers are substances in the body that transmit signals from one cell to another, facilitating communication between cells and organs to regulate physiological processes and behavior.

Chemical messengers play crucial roles in numerous bodily functions, including growth, metabolism, mood regulation and the immune response. One example of chemical messengers are neurotransmitters (Figure 2.3). These are released by neurons to transmit signals across synapses to other neurons. When an electrical impulse (known as an action potential) travels down the neural cell body (an axon) of the neuron, it releases neurotransmitters that then cross the gap between two neurons (the synapse). Neurons working together can produce a large variety of effects, resulting in a complex range of behaviors. As a result, any claim of cause-and-effect should be treated with caution.

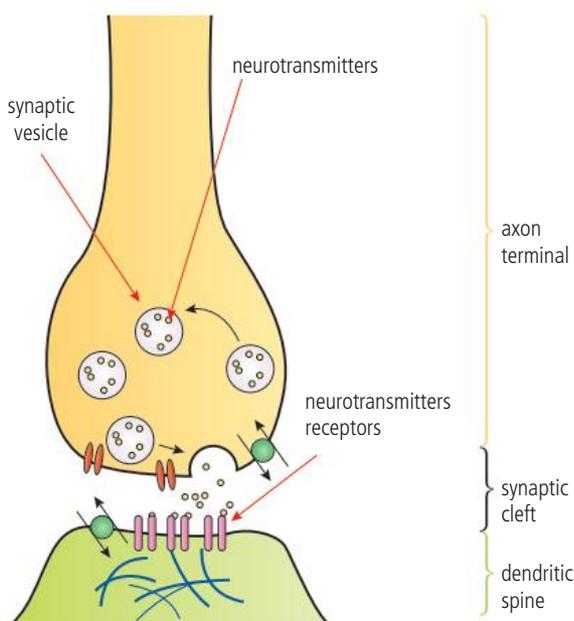


Figure 2.3 Neurotransmitters in action.

You will learn more about the role of ACh on pages 292–294.



Agonists and **antagonists** are substances that influence the effect of the neurotransmitter.

- Agonists increase the activation of a synaptic receptor by binding to synaptic receptors and increase the effect of the neurotransmitter.
- Antagonists decrease the activation of a synaptic receptor by binding and blocking neurotransmitters from binding, or by decreasing the amount of time neurotransmitters are in the synaptic cleft.

For example, Martinez and Kesner (1991) explored the impact of the neurotransmitter acetylcholine (ACh) on learning and memory in rats, using an ACh agonist and antagonist and a control treatment to manipulate ACh levels. Rats injected with scopolamine, an ACh antagonist, showed impaired memory, taking longer to navigate a maze, while those treated with physostigmine, an ACh agonist, completed the maze quicker, indicating enhanced memory. Control rats had intermediate maze completion times. The study concluded that ACh plays a crucial role in memory formation, with increased synaptic ACh levels improving memory performance. Those with decreased activation of a synaptic receptor underscored the importance of ACh in learning processes.



An interesting fact about the discovery of chemical messengers, particularly neurotransmitters, involves Otto Loewi's "dream experiment". In 1921 Loewi dreamed an experiment to prove chemical signaling between nerve cells. He woke up, went to his lab and conducted an experiment with two frog hearts. By stimulating the vagus nerve of the first heart, he slowed its heartbeat and collected the surrounding fluid. When this fluid was applied to the second heart, it also slowed, proving chemical transmission (ACh). This experiment provided the first clear evidence of neurotransmitters and earned Loewi the Nobel Prize in 1936.

Activity 20

There are many great animations and videos online that demonstrate the process of neurotransmission in action. Can you find one and share it with your class?

Diathesis-stress model

The **diathesis-stress model**, also known as the vulnerability-stress model, is a psychological theory that attempts to explain a disorder, or its course, as the result of an interaction between a predispositional vulnerability (known as the diathesis) and stress caused by life experiences.

A diathesis can take the form of genetic, psychological, biological or situational factors, and a large range of differences exists among individuals' vulnerabilities to the development of a disorder (Ingram and Luxton, 2005).

Stressors are the environmental factors or life events that trigger the manifestation of a psychological disorder in a person who is already vulnerable (Figure 2.4).

Therefore, the diathesis-stress model assumes that psychological disorders arise due to the interaction between an individual's vulnerability and stressful environmental factors (Figure 2.5).

Neither diathesis nor stress alone is sufficient to cause a disorder; it is the combination of both that leads to the development of mental health issues. For example, research has identified certain genetic markers that may predispose individuals to depression, indicating a biological vulnerability or diathesis. For instance, variations in the serotonin transporter gene (5-HTTLPR) have been associated with an increased risk of

Models provide a research framework to understand human behavior. What role do models play in the acquisition of knowledge in the human sciences? How might they help and hinder the understanding of human behavior?

TOK

developing depression, especially in the presence of stressful life events. Environmental factors – such as experiencing a significant loss, chronic stress, trauma or interpersonal difficulties – act as stressors that can trigger the onset of depressive episodes in those who are genetically predisposed.

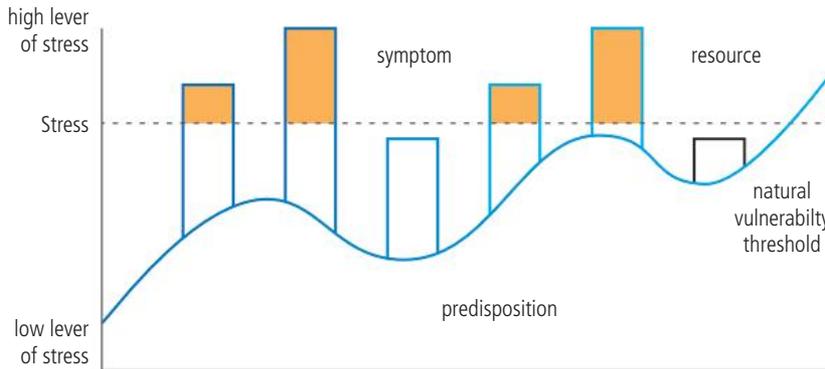


Figure 2.5 The diathesis-stress model assumes that psychological disorders arise due to the interaction between an individual's vulnerability and stressful environmental factors.

The interaction between this genetic vulnerability and environmental stressors can lead to the development of depression. For example, Caspi et al. (2003) found that individuals with one or two copies of the short allele of the 5-HTTLPR gene exhibited more depressive symptoms, diagnosable depression and suicidality in response to stressful life events than those with two long alleles.

Activity 21

Make a list of possible life stressors that an individual might encounter, and a list of possible protective factors an individual may be able to access in their environment to “buffer” or protect them from these stressors.

Genetic inheritance

Genes are made up of DNA, which provides the blueprint for the structure and function of the human body and influences thoughts, feelings and behavior to some extent. Animals, including humans, are born with **innate** behaviors to allow them to react instinctively to some environmental stimuli in a way that enhances their prospects for survival.

When considering genetic inheritance, it is important to note that not all genes are “active”, and whether they are “switched on” or “switched off” will depend on several factors. Therefore, the assumption that genes influence behavior in a linear cause-and-effect relationship can be challenged. For example, gene regulation includes internal signals such as hormones or other genes, as well as the external environment, which can also affect gene regulation and subsequent expression of observable traits.

Examples of behaviors that are influenced by genes are personality disorders. These are mental health conditions that affect how someone thinks, perceives, feels or relates to others. Antisocial personality disorder (ASPD) is characterized by impulsive, aggressive, irresponsible and sometimes criminal behavior (Figure 2.6).



Figure 2.4 Stressors can include traumatic events, significant life changes, relationship problems or chronic stress conditions.



Alleles are any of two or more genes that can appear at the same site on a chromosome. The combination of alleles in an organism determine its genotype.



Genotype refers to the genetic constitution of an individual organism, while phenotype refers to the set of observable characteristics of an individual that is a result of the interaction between the genotype and its own environment.



Figure 2.6 Someone with ASPD will typically be manipulative, deceitful and reckless, and will not care for other people's feelings.



Conceptual question

Given that much research on genetic inheritance is conducted in controlled environments, how might our knowledge of human behavior be *biased* by these limitations in studying genes in real-world, dynamic environments?

TOK

Is it possible to discover laws of human behavior in the same way that the natural sciences discover laws of nature?

Plomin and Deary (2015) proposed three "laws" of genetics for complex behavioral traits that can be used to summarize the debate over genetic versus environmental influence.

- All traits show significant genetic influence.
- No traits are 100 percent heritable.
- Heritability is caused by many genes of small effect.

These highlight the nuanced relationship between genetics and determinism, suggesting that while genetics significantly influence traits, they do not fully determine outcomes.

This aligns with the concept of *causality*, where multiple factors, both genetic and environmental, interact to shape behavior rather than there being a single deterministic cause.

There is evidence that the MAOA gene has links to ASPD. The MAOA gene is involved in encoding an enzyme responsible for metabolizing amine neurotransmitters such as dopamine, serotonin and noradrenaline, which are thought to be involved in shaping personality.

For example, Caspi et al. (2002) conducted a longitudinal study in Dunedin, New Zealand, tracking 1037 children from birth to adulthood to explore how the MAOA gene influences the development of ASPD in maltreated children. The research assessed adolescent conduct disorder, convictions for violent crimes, personality dispositions toward violence at age 26 and ASPD symptoms. Findings revealed that variations in the MAOA gene, which affects monoamine oxidase A enzyme levels, moderated the impact of maltreatment. Children with genotypes leading to higher MAOA expression showed reduced antisocial behaviors, which suggests that inherited genetic factors can mitigate the adverse effects of childhood maltreatment.

Activity 22 (CAS)

Using a **t-chart**, list the advantages and disadvantages of reporting academic research into genetics. Think back to the concepts that we explored earlier in the book to examine the impacts on wider society if academic research on genes is routinely widely reported. How might determinism relate to this issue? And ethics?

In groups, research a list of behaviors that may be considered controversial when they are linked to genetic determinants.

Localization

Localization refers to the notion that specific areas of the brain are responsible for specific behaviors. However, while some parts of the brain do play specific roles in specific behavior, rarely does a single part of the brain work in complete isolation from other areas.

One example of localization of function is the relationship between the mid-temporal area which contains structures such as the hippocampus and its involvement in spatial and visual memory. The main functions of the hippocampus involve human learning and memory. The hippocampus helps humans process and retrieve two types of memory, declarative memories and spatial relationships.

Declarative memories are those related to facts and events. Examples can include learning how to memorize speeches or lines in a play.

Spatial relationship memories involve pathways or routes. For example, when a cab driver learns a route through a city, they use spatial memory. Spatial relationship memories appear to be stored in the right hippocampus.

For example, Maguire et al. (2006) investigated the relationship between different parts of the hippocampus and spatial memory by comparing London taxi drivers,

who navigate varied routes, with bus drivers, who follow fixed routes. In this quasi-experiment, 35 male volunteers, including 18 taxi drivers and 17 bus drivers, underwent structural MRI scans to assess hippocampal volume. The study found that taxi drivers had a larger volume in the mid-posterior hippocampi and yet smaller volume in the anterior hippocampi, suggesting brain adaptation to extensive navigational experience. Furthermore, increased navigational experience was positively correlated with right posterior hippocampal volume in taxi drivers. This indicates that spatial knowledge can be localized to the hippocampus as navigational experience significantly influences hippocampal structure, independent of stress or driving duration.

However, the idea that specific brain areas are dedicated to specific behaviors or cognitive functions, has several limitations. For example, the brain exhibits a significant degree of plasticity, meaning it can adapt and reorganize itself. The study by Maguire et al. (2006) shows that the hippocampi of London taxi drivers adapt over time to their navigational experience, indicating that brain structures are not completely fixed but can change in response to environmental demands and experiences. Furthermore, behaviors and cognitive functions often involve multiple brain regions working together, rather than being isolated to a single area. Finally, studies investigating brain-behavior relationships often rely on specific methodologies (e.g. MRI in Maguire et al., 2006) that can have their own limitations, including resolution constraints and the challenge of correlating structural changes with specific behaviors conclusively.

Neuroplasticity

Neuroplasticity refers to the ability of the brain to form and reorganize synaptic connections between neurons, especially in response to experience or following injury.

One example of neuroplasticity is **neural pruning**, which refers to the process of removing neurons that are no longer used or useful in the brain. When unused synapses are pruned, the effectiveness of more commonly used neural circuits is increased. This is how synaptic pruning helps the formation and connections of other more commonly used neural networks.

One example of neuroplasticity/pruning is the changes that take place in the mid-temporal area (which contains structures such as the hippocampus) as a result of being involved in prolonged activities that use spatial and visual memory. For example, Maguire et al. (2006) investigated the relationship between different parts of the hippocampus and spatial memory by comparing London taxi drivers, who navigate varied routes, with bus drivers, who follow fixed routes. They found that taxi drivers had a larger volume in the mid-posterior hippocampi but a smaller volume in the anterior hippocampi. This suggests that the brain adapts to extensive navigational experience.

However, the researchers then tested for functional differences between the groups in terms of their ability to acquire new visuo-spatial information after a 30-minute delay. They did this by asking participants to draw an image of the Rey–Osterrieth complex figure (ROCF) (Figure 2.7). The ROCF is one of the most widely used tests of spatial memory in neuropsychology.

They found that taxi drivers were actually less successful in recalling this figure (which was new to them) even though they were more capable of recalling routes around London that they were familiar with. Maguire et al. (2006) speculated that maintaining a complex spatial representation of a complex object (such as London's

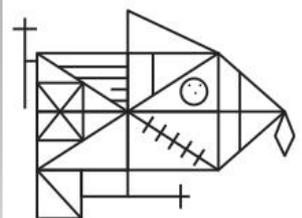


Figure 2.7 The Rey–Osterrieth complex figure.

What assumptions underlie the methods used in the human sciences? For example, Maguire may have assumed that brain areas can be linked to specific behaviors such as spatial memory abilities. However, she admits in her research that causal relationships are difficult to establish because of her use of a quasi-experiment. To what extent is knowledge limited by the philosophical limitations of methodologies?

TOK

road network) might need a cognitive trade-off with a decreased ability to form new spatial memories of new complex objects (such as the ROCF). Therefore, the taxi drivers' ability to navigate a familiar complex pattern can be associated with greater posterior hippocampal gray matter volume, while their lesser ability to form new spatial memories can be correlated with decreased matter volume in the anterior hippocampus – showing the effect of possible neural pruning that decreases their ability to remember unfamiliar complex figures.



Conceptual question

As neuroplasticity allows the brain to *change* over time, how can we tell whether behavioral changes are due to natural maturation or the result of an intentional intervention?

Neurotransmission

Neurotransmission refers to the way neurons communicate with each other across synapses, the small gaps between neurons. Neurotransmitters are released by neurons to transmit signals across synapses to other neurons. When an electrical impulse (an action potential) travels down the neural cell body (an axon) of the neuron, it releases neurotransmitters which then cross the gap between two neurons (the synapse).

The understanding of neurotransmission provides psychologists with insights into the biological underpinnings of mental health conditions, enabling the development of targeted interventions to improve health and wellness. For example, the neurotransmitter serotonin is linked to mood and anxiety; therefore, medication that acts on the serotonin can be used to treat mood and anxiety disorders. An example of a biological treatment is SSRIs, which are a common treatment for patients with PTSD and depression. They are usually used alongside psychological therapies and allow individuals to access these therapies more effectively as they reduce symptoms associated with anxiety.

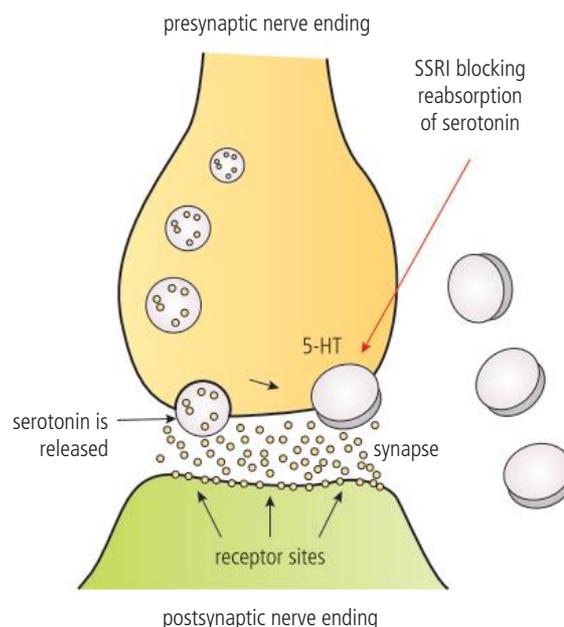


Figure 2.8 How SSRIs work.

SSRIs work in the following way (Figure 2.8).

- The presynaptic cell sends information via a synapse (gap between cells) as neurotransmitters such as serotonin are released into the gap.
- The receptors on the surface of the postsynaptic cell recognize these neurotransmitters and pass on the signal.
- 90 percent of neurotransmitters are released from the receiving receptors and taken up again by the sending cell (known as reuptake).
- SSRIs inhibit the reuptake of serotonin, meaning it stays in the synaptic gap longer.
- This can lead to repeated stimulation of the receptors on the postsynaptic nerve.

Therefore, SSRIs work by increasing the amount of time serotonin spends in the synapse, thereby increasing the effect of serotonin on receptors. However, it should be noted that SSRIs do not increase the level of serotonin.

For example, Davidson et al. (2001) examined the effectiveness of sertraline, an SSRI, in preventing PTSD relapse, comparing it to a placebo in a double-blind field experiment involving 96 North American patients. The participants, who had been diagnosed with PTSD, were randomly assigned to receive sertraline or a placebo for 28 weeks, with assessments every second week using standardized PTSD scales. The study found that sertraline significantly reduced relapse rates compared to the placebo (5 percent vs. 26 percent), concluding that sertraline effectively maintains improvements in PTSD symptoms and offers relapse protection.

Therefore, Davidson et al. (2001) suggest that PTSD can be treated with biological measures such as SSRIs. As the participants were randomly allocated to receive the SSRI (or not), this helped to minimize any effects of individual differences that may have influenced PTSD severity. This in turn suggests that the process of neurotransmission can be targeted to successfully treat PTSD and improve health and wellness.

Activity 23 (CAS)

Either draw a flow diagram showing the entire process of neurotransmission or use stop motion photography to design a film that can educate a younger audience about the process of neurotransmission.

Investigating psychological concepts in the biological approach

Bias: In what way may our knowledge of human behavior be biased?

Our knowledge of human behavior may be biased by the limitations of animal models in research. Animal models are commonly used under the assumption that findings in animals can be generalized to humans. However, there are significant differences between humans and animals, both biologically and psychologically. For example, Sorge et al. (2014) demonstrated how male researchers caused higher levels of the stress hormone corticosterone in mice compared to female researchers. The study showed that even subtle factors, such as the gender of the researcher, can influence

animal behavior. This suggests that animals may respond differently to humans based on environmental cues that are irrelevant to human psychology. Furthermore, since animals lack the complex cultural, social and cognitive dimensions that affect human behavior, it becomes difficult to fully extrapolate findings from animals to humans without introducing bias. Thus, relying too heavily on animal models may lead to biased interpretations of human behavior. The findings may not always hold true when tested in human populations, as the unique aspects of human experience are not accounted for in animal studies.

Activity 24

Research another study that uses animal models. Identify potential biases that could limit the generalization of the results to human behavior, and suggest how these biases could be addressed.

Causality: How can we know the cause(s) of observed behavior?

One way to know the causes of observed behavior is to standardize and control variables in research. For example, Maguire et al. (2006) investigated the relationship between different parts of the hippocampus and spatial memory by comparing taxi drivers in London, who navigate varied routes, with bus drivers, who follow fixed routes. She found that taxi drivers had a larger volume in the mid-posterior hippocampi but a smaller volume in the anterior hippocampi, suggesting that brain adaptation to extensive navigational experience and spatial knowledge can be localized to the hippocampus. The quasi-experimental nature of the design means there was no direct manipulation of the independent variable, so caution should be used when assuming a causal relationship between the variables. However, Maguire standardized her design and put controls in place. For example, the taxi drivers and bus drivers were matched for driving experience and levels of stress, differing only in that they needed different navigational skills. Therefore, this increases confidence in the validity of the research and allows tentative **causation** to be assumed.

Activity 25

Choose a quasi-experimental study and critique it for how well it controls for variables. Analyze whether the study's conclusions about causality are justified. Suggest additional controls or steps that could have been taken to improve the strength of the causal inferences.

Change: How can we know if a behavior is a result of natural maturation or purposeful intervention?

Distinguishing between behaviors caused by natural maturation and those resulting from purposeful intervention requires well-designed experiments with control and intervention groups. By comparing changes in behavior between these groups, researchers can assess whether observed differences are due to the intervention or simply natural growth. For example, Martinez and Kesner (1991) studied the role of ACh in memory by manipulating ACh levels in rats. The researchers used an agonist

Use relevant technical terminology in your answers. Create vocabulary lists to help you memorize the key terms. At the end of your answer, provide a summary sentence that links the explanation to the example and to the question.



(which increased ACh levels), an antagonist (which decreased ACh levels) and a control group. The rats with enhanced ACh performed better in a maze task, while those with reduced ACh performed worse. The control group showed intermediate performance, demonstrating that the differences in memory were due to the intervention (ACh manipulation) rather than natural maturation. This design allowed the researchers to isolate the effects of ACh on memory by comparing treated rats to untreated rats, ruling out the possibility that changes in behavior were simply due to the rats' natural cognitive development.

Activity 26

Find another study involving the manipulation of neurotransmitters or brain activity. Compare the intervention group with the control group and identify how the researchers distinguished between natural maturation and the effects of the intervention. Create a flowchart that illustrates how the researchers differentiated between changes due to natural maturation and those caused by an intervention.

Measurement: How can we express complex psychological constructs in terms of observable measurable behavior?

Complex psychological constructs like memory, anxiety or stress are often expressed in terms of measurable behaviors or biological markers. For example, Davidson et al. (2001) examined the effectiveness of SSRIs in preventing PTSD relapse by using standardized scales to measure PTSD symptoms. The study utilized the PTSD checklist, which provides a quantifiable measure of the severity and frequency of PTSD symptoms. By assigning numerical values to symptoms such as nightmares, flashbacks and avoidance behaviors, the researchers could observe reductions in these behaviors in patients treated with SSRIs compared to those given a placebo. The measurable decrease in symptoms allowed the researchers to conclude that SSRIs were effective in maintaining improvements in PTSD patients. Thus, by translating complex emotional and psychological states into observable symptoms and behaviors, psychologists can create standardized measures that allow for objective comparisons across individuals and treatments. This process not only makes the constructs scientifically testable but also enhances the reliability of the findings.

Activity 27

In small groups, research how a specific psychological construct (such as anxiety or stress) has been operationalized in a study. Explain to your peers the observable behaviors or biological markers used to measure this construct, and discuss how these methods enhance the reliability of the findings.

Perspective: What are the strengths and limitations of a reductionist approach to studying behavior?

Reductionism, which breaks down complex psychological phenomena into simpler biological components, has several strengths, such as precision and the ability to isolate variables. For example, Davidson et al. (2001) explored the role of serotonin

in PTSD by using SSRIs to manipulate serotonin levels in the brain. This reductionist approach allowed the researchers to pinpoint serotonin's role in reducing PTSD symptoms and provided evidence for a biological treatment. The strength of this approach lies in its scientific rigor; by isolating one variable, serotonin, the researchers could make specific inferences about its role in PTSD. However, a significant limitation of reductionism is that it oversimplifies complex phenomena. PTSD is influenced by environmental, social and psychological factors, none of which were addressed in the study. As a result, not all individuals benefited from SSRI treatment, suggesting that focusing solely on biological mechanisms may overlook other contributing factors. This highlights the importance of complementing reductionist research with more holistic approaches that consider the broader context of human behavior.

Activity 28

Pick a different reductionist study and outline how it isolates a specific biological factor. Then, identify one environmental or psychological factor that the study may have overlooked, and discuss how considering this factor could provide a more comprehensive understanding of the behavior.

Responsibility: Can potential benefits of research justify partial relaxation of ethical standards?

In some cases, the potential benefits of research may justify a partial relaxation of ethical standards, particularly when the research could significantly advance our understanding of human health. For example, Martinez and Kesner (1991) conducted research on rats to investigate the role of ACh in memory formation. This study involved manipulating ACh levels using agonists and antagonists, which required invasive procedures. Although the use of animals raises ethical concerns, the findings provided valuable insights into the biological mechanisms underlying memory, contributing to the development of treatments for memory-related disorders in humans. The ethical debate often revolves around balancing the scientific value of the research with the well-being of the animal subjects. Ethical guidelines, such as the 3Rs (Replacement, Reduction and Refinement), help to ensure that animal research is conducted responsibly, minimizing harm while allowing important discoveries to be made. Therefore, while ethical standards should not be ignored, the potential benefits of research can, in some cases, justify ethical compromises when the scientific and medical gains outweigh the ethical costs.

Activity 29

Imagine you are part of a Research Ethics Committee evaluating a reductionist study that focuses on a biological factor influencing behavior. Discuss any ethical concerns that arise from simplifying complex human behaviors. Discuss whether the potential benefits of the research outweighed the ethical concerns, and how the researchers balanced these considerations.

Cognitive approach

Psychological terminology	Learning objective
Anchoring bias	The role of anchoring bias in decision-making.
Classical conditioning	The process of classical conditioning and its role in behavior.
Cognitive load theory	The role of cognitive load theory in understanding human cognition.
Cognitive models	The role of one or more cognitive models in understanding a cognitive process or behaviors.
Confirmation bias	The role of confirmation bias in decision-making.
Dual processing theory	The role of the dual processing theory in understanding decision-making.
Operant conditioning	The process of operant conditioning and its role in behavior.
Schema theory	The role of schema theory in understanding a cognitive process.

▲
Table 2.2 Cognitive approach learning objectives from Subject Guide, page 25.

Introduction to the cognitive approach

The cognitive approach to understanding human behavior arose in opposition to behaviorism during the early to mid-twentieth century. Behaviorism had introduced concepts such as **classical conditioning**, illustrating the formation of associations between stimuli and responses, and **operant conditioning**, which revealed how behavior is shaped through rewards and penalties. These principles are still utilized in contemporary educational methods, including personalized learning strategies that employ individual rewards and feedback to promote desired behaviors and encourage student motivation.

However, the cognitive approach emphasizes the significance of internal mental processes in the analysis of observable behavior. It assumes that the mind is an information processing system that mediates between stimulus input and behavioral output. The study of how humans process sensory information constitutes the essence of cognitive psychology and has led to the development of **cognitive models** such as the computer model for information processing, memory models and theories of language development.

Interest initially focused on the accuracy of human cognitive functions and their variation due to individual, social and cultural experiences, as well as the impact of language on the expression of ideas. Early 20th-century psychology researchers explored the organization and interpretation of information via mental structures or schemas, which influence human perceptions and recollections.

Moreover, the dual processing model, a fundamental theory within the cognitive approach, assumes that humans operate on both conscious and unconscious levels, leading to cognitive *biases* that shape behaviors and decision-making processes. Cognitive theories have become instrumental in applied psychology, offering insights into human development, as well as the emergence and mitigation of health issues and educational challenges.



Conceptual question

As cognitive psychology focuses on internal processes, how might our understanding of human behavior be *biased* if the research relies too heavily on culturally specific models or populations?

Anchoring bias

Anchoring bias refers to the human tendency to rely too heavily on the first piece of information (the “anchor”) encountered when making decisions. This initial information sets a reference point, and subsequent judgments are made by adjusting away from that anchor, often insufficiently.

This cognitive bias affects various types of decision-making, including financial, sociocultural and personal decisions. For example, Tversky and Kahneman (1974) asked participants to estimate the percentage of African countries in the United Nations after seeing a random number generated by a “wheel of fortune” (Figure 2.9). The key manipulation was that the wheel produced either a high number (65) or a low number (10) as the starting point or “anchor”. Despite the anchor’s irrelevance to the actual question, participants’ estimates were significantly influenced by it: those who saw the higher number gave higher estimates, and those who saw the lower number gave lower estimates.



Figure 2.9 The wheel of fortune can provide an anchoring bias.

This study shows how an anchoring bias using unrelated initial information can skew subsequent judgments and decisions. Even when individuals are aware that the anchor should not influence their estimation (by spinning the wheel), the initial number significantly impacts their final judgment. Further research has shown that initial salary offers, for example, have a strong anchoring effect on the final agreed-upon salary, illustrating the influence of anchoring bias in practical settings.

You will be asked to explain or describe a psychological idea or a theory and be expected to provide an example. Make sure you cite a specific behavior and state clearly how it illustrates the idea or theory.



Anchoring bias demonstrates how initial information, even if arbitrary, can significantly influence subsequent judgments and decisions, emphasizing the need for awareness and strategies to mitigate its effects in critical decision-making processes.

Activity 30

Think about situations in your school where initial information or first impressions play a significant role. Consider academic settings, social interactions and extracurricular activities. For example, consider how the first test score in a class might influence a student's perception of their ability in that subject.

Now consider which contexts of psychology these examples could connect to.

Classical conditioning

Classical conditioning is defined as a type of unconscious or automatic learning that creates a conditioned response through associations between an unconditioned stimulus and a neutral stimulus (Wolpe and Plaud, 1997).

This mechanism explains how organisms adapt to their environments by learning to predict occurrences of significant events. The process involves pairing a neutral stimulus (which initially does not elicit a particular response) with an unconditioned stimulus (which naturally elicits a response) until the neutral stimulus alone can evoke a similar response, now termed a conditioned response.

Classical conditioning can explain a phobia such as anxiety around spiders through the association of spiders (a supposed neutral stimulus) with a frightening experience (unconditioned stimulus) such as a parent screaming. This elicits a fear response (unconditioned response). Over time, the mere sight of spiders becomes a conditioned stimulus, triggering a conditioned fear response (phobia) even without the original frightening experience of the parent screaming (Figure 2.10). However, it should be noted that there are evolutionary explanations as to why people are afraid of certain stimuli, and therefore classical conditioning may not provide a full explanation for all phobias. This shows how different *perspectives* can be used to explain behaviors.

Ivan Pavlov (1849–1936) was a Russian physiologist who used sound as a neutral stimulus and paired it with the presentation of food to dogs. After repeated pairings, the sound alone, without the presentation of food, began to cause the dogs to salivate. Pavlov's work not only illustrates the basic principles of classical conditioning but also highlights its implications for understanding a wide range of behaviors and psychological phenomena. This foundational study has paved the way for subsequent research exploring the mechanisms of learning and adaptation in both animals and humans (such as in the development of phobias). It reveals the significance of conditioned learning in behavior and mental processes.



Figure 2.10 Are you scared of spiders? Are members of your family scared too?



Conceptual question

Pavlov's work shows how conditioning can alter behavior, but how can we know whether a behavior *change* is due to purposeful intervention (like conditioning) or natural maturation over time?

You will learn more about Pavlov's experiment on pages 277–278.

If there are competing perspectives for behaviors, how can their validity be measured, and to what extent can we be certain which one is more correct?

TOK

Activity 31 (CAS)

Step 1: Draw a flow diagram to illustrate the process of classical conditioning for one of the following behaviors:

- a student feeling anxious when entering a classroom
- a person feeling hungry when they see a food advertisement
- a child becoming fearful of the doctor's office
- a cat coming to the kitchen when it hears the can opener.

Step 2: Now you have completed the steps of classical conditioning, label your diagram with potential alternative explanations for the behavior.

Cognitive load theory

Cognitive load theory (CLT) draws on evolutionary theory to understand human cognitive architecture (Sweller, 2011). It has been used to develop instructional methods in education.

CLT proposes that knowledge can be categorized into biologically primary knowledge, which we are naturally predisposed to acquire, and biologically secondary knowledge, which is significant for cultural reasons and is the focus of instruction. Engaging with secondary knowledge requires a substantial information store, the bulk of which is acquired by assimilating information from other sources. The theory suggests that any new information is produced through a random generate-and-test method, with the capacity to process new information being severely limited at any given time. CLT suggests, therefore, that the human brain has a limited capacity in its working memory for processing new information, that the design of tasks can either help or hinder learning based on how information is presented and the cognitive demands placed on learners.



Conceptual question

Cognitive load theory offers a reductionist explanation of how humans process information, but what are the strengths and limitations of using such a reductionist approach to study human learning?

To understand cognitive load, CLT uses well-known cognitive theories about how humans process and store information:

- human memory is divided into long-term memory and working memory
- processing of new knowledge leads to “cognitive load” on working memory, which may influence learning outcomes
- content knowledge is stored in the form of schemas in long-term memory (Figure 2.11).

CLT identifies three types of cognitive load: intrinsic (the complexity of the material), extraneous (how the material is presented) and germane (the effort required to process and understand the material).

Therefore, for an effective learning process, one must:

- optimize extraneous cognitive load
- manage intrinsic cognitive load
- promote germane cognitive load.

Therefore, CLT can be useful in planning for effective learning. It recommends reducing unnecessary cognitive demands (extraneous loads such as unnecessary imagery or teacher-added content), managing the complexity of the material (intrinsic load) and maximizing the resources devoted to meaningful learning processes (germane load, such as writing out key points). A CLT approach would aim to optimize the use of limited cognitive resources to enhance the learning and comprehension of new content.

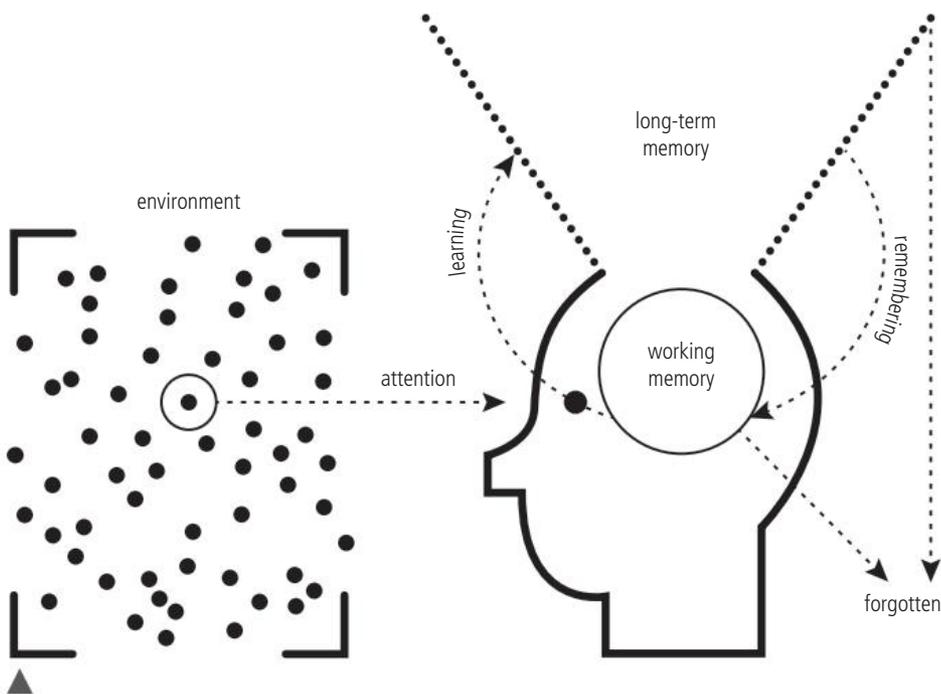


Figure 2.11 How the brain stores long-term memory.

Activity 32

Find a teaching resource from any one of your IB Diploma subjects that you find cognitively demanding. Think of ways to reduce cognitive demand using the principles of CLT.

Cognitive models

Cognitive models are theoretical constructs that attempt to simulate human thought processes. Cognitive models help us to understand how people perceive, remember, think and solve problems. They aim to represent how human cognition functions to predict and explain behavior in various cognitive tasks.

For example, memory models provide a framework for understanding human memory processes.

Example: Multi-store model (MSM) – Atkinson and Shiffrin (1968)

The MSM assumes that human memory has three separate components that are characterized differently according to encoding, capacity and duration (Table 2.3).

- Encoding: Refers to the way information is processed.
- Capacity: Refers to the amount of information that can be processed.
- Duration: Refers to the amount of time information can be stored for.

Sensory register (SM, for sensory memory)

This store receives and processes information from the senses. When a stimulus is detected, such as when a sound is heard or when a visual image is seen, it is “stored” very briefly in the sensory register. If the stimulus is given attention, it is transferred to the model’s short-term store (STS). If no attention is given to the stimulus, it quickly decays and is forgotten. Most information in the SM is lost.

Short-term store (STS)

This store receives and processes information from the sensory register and the long-term store (LTS). Information can be retained in the STS for up to 30 seconds if it is actively rehearsed. If it is not rehearsed, it decays and is forgotten. Information that is rehearsed sufficiently can be stored in the LTS. The longer an item is rehearsed in short-term memory, the stronger its memory trace will be in long-term memory.

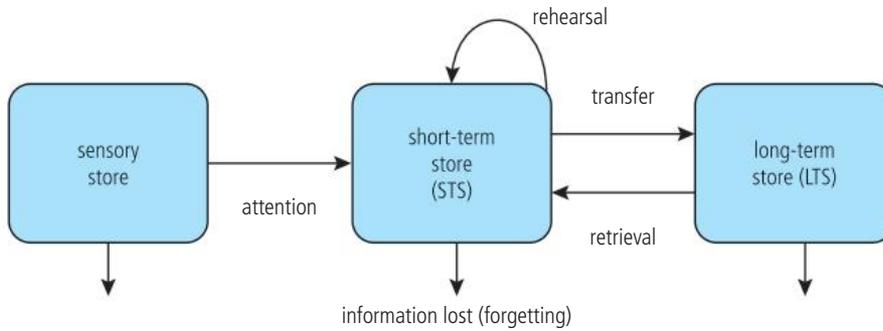
Long-term store (LTS)

This store receives and processes information from the STS. Information that has been rehearsed in the STS is held indefinitely in the LTS. Information is retrieved from the LTS into the STS so that it can be recalled.

Store	Encoding	Capacity	Duration
SM	Sense specific. For example, visual information is encoded visually.	1 sensation	Less than 1 second
STS	Mainly acoustic.	7 ± 2 chunks (pieces of information)	18–30 seconds
LTS	Mainly semantic (according to meaning) but can be visual and auditory.	Unlimited	Unlimited

Table 2.3 The encoding, capacity and duration of the human memory components.

The MSM assumes that information passes from store to store in a linear way. It has been described as an information-processing model (like a computer) with an input, process and output. Information is detected by the sense organs and enters the SM, which stores a fleeting impression of sensory stimuli. If attended to, this information enters the STS; if the information is rehearsed, it is passed on to the LTS (Figure 2.12).



▲ **Figure 2.12** The multi-store model of memory – Atkinson & Shiffrin (1968).

Example: Working memory model (WMM) – Baddeley and Hitch (1974)

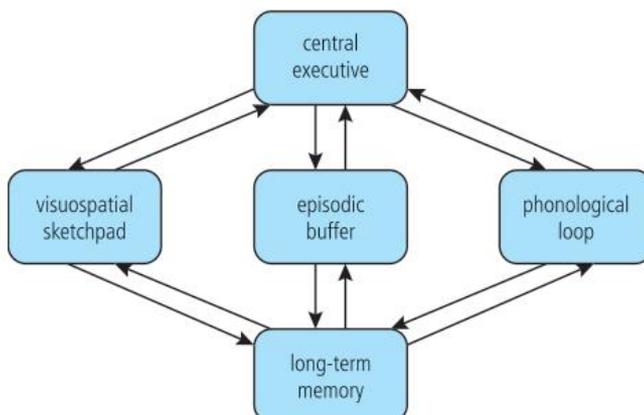
The WMM is a further development of the STS proposed by the MSM (Figure 2.13). It separates the STS into three main components.

- Central executive (CE): Controls the flow of information and acts as a general manager of the WMM. The CE allocates data to the subsystems: the phonological loop and the visuospatial sketchpad. The CE uses an episodic buffer as a temporary storage device that integrates information from the other components. It acts as a link to the LTS and maintains a sense of time, so that events occur in a continuing sequence.
- Phonological loop: Processes spoken and written material. It is further subdivided:
 - Phonological store (inner ear): holds information in a speech-based form.
 - Articulatory control process (inner voice): rehearses verbal information in a loop.
- Visuospatial sketchpad (inner eye): Processes visual and spatial information. Visual information refers to objects' characteristics such as their size, shape, surface texture and color. Spatial information refers to where images are relative to each other.



Conceptual question

Cognitive models like the WMM allow us to study mental processes, but how can we express complex psychological constructs, such as memory, in terms of observable, *measurable* behavior?



▲ **Figure 2.13** The working memory model – Baddeley and Hitch (1974).

TOK

What role do models play in the acquisition of knowledge in the human sciences? Do models help or hinder knowledge in psychology? For example, what is the value of having two models of memory? What does the working memory model explain that the multi-store model cannot?

Activity 33

The WMM is really an elaboration of the short-term memory from the MSM. Can you draw a diagram that combines the WMM with the MSM?

Activity 34

Check your digit-memory span! Work with a partner. Devise eight strings of digits each, starting with a string of three (e.g. 682), then four (e.g. 9184), five (e.g. 36187) and so on until you have a string of 10 numbers. Do not let your partner see the number sequences you have devised.

Now, one of you reads out your three-digit string while the other writes down your digits in the same sequence immediately after hearing them. Work in order through the eight digit strings until each string has been read out and recalled.

Now swap roles and repeat the procedure, so that the other person reads out their strings of digits. Note your scores.

- How did you try to remember the numbers?
- How might you increase your short-term memory span?

Research alternative models of memory such as the Levels of Processing approach. How can competing explanations in the human sciences be resolved?

Confirmation bias

Confirmation bias is defined as a cognitive *bias* that influences individuals to favor, seek out, interpret and remember information in a way that confirms their pre-existing beliefs or hypotheses, while giving disproportionately less consideration to alternative possibilities.

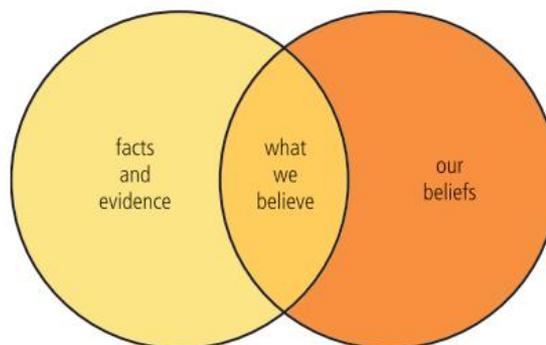


Figure 2.14 Confirmation bias.

Confirmation bias occurs in various contexts, including decision-making, belief formation and interpersonal relationships. It can lead to overconfidence in personal beliefs and can maintain or strengthen beliefs in the face of contrary evidence (Figure 2.14). Essentially, confirmation bias causes individuals to selectively gather or recall information that supports their own opinions, leading to a skewed

Confirmation bias can often be presented as a negative human behavior by teachers. Is the role of the human scientist only to describe what the case is or also to make judgments about what should be the case?

TOK

perception of reality. It demonstrates the impact of pre-existing attitudes on the interpretation of new information, potentially hindering objective analysis and critical thinking.

For example, Lord, Ross and Lepper (1979) asked participants with opposing views on the death penalty to examine evidence from two studies regarding the effectiveness of capital punishment as a deterrent to crime. One study suggested that the death penalty was effective as a deterrent to crime, while the other study suggested that the death penalty was not an effective deterrent. The crucial point was that the data from these studies could be interpreted in different ways, depending on one's prior beliefs. Participants were divided based on their existing views on the death penalty – either strongly in favor or strongly against.



Conceptual question

While confirmation *bias* studies provide important insights into human decision-making, can the potential benefits of research justify partial relaxation of ethical standards, especially when using deceptive techniques?

After reading summaries of the two studies, each group was asked to evaluate the methodology and overall persuasiveness of the studies. Participants who were pro-death penalty found the study supporting the deterrent effect of the death penalty to be more convincing and methodologically sound, while they criticized the study that argued against the deterrent effect. Conversely, participants who were anti-death penalty found the study that supported their stance (against the deterrent effect) to be more credible and well-conducted, while they found faults in the study supporting the death penalty's effectiveness. This selective evaluation of the same set of data, based on pre-existing beliefs, demonstrates how individuals gave more weight to evidence that supported their initial beliefs and discounted evidence that contradicted them, leading to further polarization of their views.

Activity 35

Look at the study by Lord, Ross and Lepper (1979). The important point was that the data from the studies they used could be interpreted in different ways, depending on one's prior beliefs. Design a similar study (which you should *not* carry out) to investigate the effect of cognitive bias on a specific perception or behavior.



This activity links to the concept of *measurement*. What method would you select, and why, when deciding on a valid way to measure confirmation bias?

Dual processing theory

Kahneman (2011) proposed a dual system model that explains the difference between two types of thinking.

- System 1: Intuitive thinking (automatic), which is seen as quick, requires limited effort and is more influenced by biases.
- System 2: Rational thinking (controlled), which is seen as slower, requires intentional effort over time and is less influenced by biases.

The model suggests that decision-making can be divided into relatively quick, intuitive decisions and relatively slow, more rational decisions.

Kahneman and Tversky (1983) demonstrated **conjunction fallacy** through a seemingly straightforward questionnaire. Conjunction fallacy refers to the belief that two or more specific conditions are more probable than a single, general condition – when the opposite is true. Therefore, it is an example of intuitive thinking over more rational thinking. Participants, varying from statistically naive undergraduates to sophisticated PhD candidates, were presented with a description of a character called “Linda”, who was described as a stereotypical “social justice warrior”. When asked to evaluate the likelihood of Linda being merely a bank teller versus being a bank teller who is also an active feminist, an overwhelming majority – almost 90 percent – erroneously leaned toward the latter, more specific yet statistically less probable scenario.



Conceptual question

Dual processing theory suggests that both intuitive and rational thinking influence decisions, but how can we know whether an observed behavior is caused by fast, intuitive thinking or more deliberate, rational thinking?

The study shows the prevalence of intuitive thinking because 90 percent of the participants were unable to spot the conjunction fallacy (whereby general conditions are more probable than specific conditions) and fell into this style of thinking. However, the study also shows rational thinking: 10 percent of the participants were able to spot the conjunction fallacy and not fall into this style of thinking.

Activity 36

Do you think you have ever been the victim of the conjunction fallacy or other people’s over-reliance on intuitive thinking? Have there been situations where people have known a few things about you and then “filled in the blanks”, assuming other things about you without any evidence?

TOK

Human scientists consider to what extent the instrument they are using to measure a behavior can allow them to measure accurately and then make predictions. Are predictions in the human sciences inevitably unreliable? Furthermore, human behavior is often simplified to allow it to be researched in a way that produces reliable data. To what extent do these approaches provide accurate understanding of human behavior? How can we be certain?

It might be noted, Bechara et al. (2000) explored decision-making in individuals with ventromedial prefrontal cortex (vmPFC) damage. They compared them with healthy controls using an apparatus known as the Iowa Gambling Task. This *measures* decision-making abilities by requiring participants to choose cards from decks that offer varying rewards and penalties. “Good decks” have fewer rewards but fewer penalties, so the overall rewards are greater, while “bad decks” have larger rewards but greater penalties, so the overall rewards are fewer. The study found that those with vmPFC damage struggled to choose “good” decks, which provide long-term gains, demonstrating impaired impulse control and decision-making. This suggests that the vmPFC plays a role in enabling rational, System 2 processing, highlighting biological underpinnings for the dual processing theory.

Operant conditioning

Operant conditioning is defined as a type of learning in which the strength of a behavior is modified by the behavior’s consequences, such as reward or punishment (Skinner, 1938).

This psychological mechanism explains how organisms adjust their actions based on the outcomes they experience, thereby learning to repeat behaviors that lead to

positive results and avoid those that lead to negative outcomes. The process involves applying reinforcement (which increases the likelihood of a behavior being repeated) or punishment (which decreases the likelihood of a behavior being repeated) after the behavior has occurred.

For example, Skinner used a specially designed chamber (known as the Skinner box) for research with rats. In this setup, a rat pressing a lever (the behavior) would receive food (a reinforcement), which naturally increased the likelihood of the lever-pressing behavior being repeated. Over time, the rats learned to press the lever more frequently to obtain food. Conversely, if pressing the lever resulted in an unpleasant stimulus (a punishment), the rats would learn to avoid pressing the lever. This demonstrates, in an academic and controlled setting, how behaviors are influenced by their consequences.



Using animal participants raises questions about *responsibility* in psychology research.

Activity 37

How could you use operant conditioning to increase or decrease the behaviors of those around you? Could you add in a reinforcement such as praise when your younger siblings help out with some chores or an expression of gratitude when a peer supports you through a tricky situation? Can you think of a time when the principles of operant conditioning have been applied to you to make you change your behavior?

Therefore, operant conditioning can explain a wide range of human behaviors through the concepts of reinforcement and punishment.

- Language acquisition: Children learn to speak and use language effectively through positive reinforcement. When a child says a word correctly and receives praise or attention, they are more likely to repeat the word.
- Study habits: Students may develop effective study habits due to the positive outcomes associated with them, such as good grades (positive reinforcement) or the avoidance of poor grades (negative reinforcement).
- Addiction: **Drug misuse** can be reinforced by the pleasurable feelings that substances provide (positive reinforcement) or by the relief they offer from negative states (negative reinforcement).
- Phobias and anxiety: Avoidance behaviors in anxiety disorders can be reinforced if avoiding a feared object or situation leads to reduced anxiety.
- Consumer habits: Shopping behaviors can be reinforced by the satisfaction or rewards obtained from making a purchase (positive reinforcement) or by sales and discounts that reduce the cost (negative reinforcement).



Activity 38

Operant conditioning can explain a wide range of human behaviors through reinforcement and punishment. Some of those behaviors are listed above. In groups, list other behaviors that operant conditioning can explain. Then, categorize them in terms of how they might apply to various contexts. Are there any alternative *perspectives* that can also explain these behaviors?

Schema theory

Schema theory proposes that cognitive frameworks known as schemas help to organize and interpret information. Therefore, schemas are mental representations that organize knowledge, beliefs and expectations. Schema processing is to a large extent automatic and unconscious, which saves cognitive energy, but can therefore result in *biases* in thinking and memory processes.

Schemas can influence memory via their connection with language. Cognitive linguistics suggests that language can help form image schemas, which are representations of scenes and events (Lakoff, 1987). In particular, action verbs can lead to the formation of schemas that help people make sense of their environment (Hart, 2019). Furthermore, the presence of action verbs can create schemas that influence the retrieval of information from long-term memory.

Activity 39

As an IB student, you are also a language learner. Do you notice any differences between action verbs in your native language compared to the language(s) you are learning? Are there examples of action verbs that cannot be translated directly?

For example, Loftus and Palmer (1974) demonstrated that schemas can create false memories, which refers to the recall of an event that never happened but is believed to be true. They showed 150 students a film of a car accident, then questioned them using leading questions with different verbs. Some participants were asked: "About how fast were the cars going when they smashed each other?" Others were asked: "About how fast were the cars going when they contacted each other?" A week later, participants were asked about seeing non-existent broken glass. Those questioned using the verb "smashed" were more likely to recall false memories of broken glass, illustrating how schemas can be created using certain words, leading to possibly false memories about events.

Investigating psychological concepts in the cognitive approach

Bias: In what way may our knowledge of human behavior be biased?

Our knowledge of human behavior can be biased by the methods, assumptions and cultural influences that shape psychological research. One way this happens is through

Is human behavior too complex to study reliably and accurately? For example, schemas may provide fixed patterns of thought that organize categories of information, but they are unlikely to work in the same way for everyone. Many factors influence them, such as emotions and culture. This presents researchers with problems when trying to accurately predict human behavior in wider populations.

TOK

Use relevant technical terminology in your answers. Create vocabulary lists to help you memorize the key terms as part of your ongoing revision exercises.



the reliance on culturally specific models or samples that do not account for global diversity. For example, much psychological research is conducted in Western, Educated, Industrialized, Rich and Democratic (WEIRD) societies, which can lead to biased conclusions about human behavior that are not universally applicable. A bias in sampling can result in theories that claim to be generalizable but only reflect the behaviors and attitudes of a specific subset of the global population. Anchoring bias, as demonstrated by Tversky and Kahneman (1974), shows how individuals' judgments can be systematically skewed by initial information. If researchers or participants are influenced by culturally or contextually specific anchors, their understanding and interpretation of behavior can be limited to those influences, leading to a biased view of human psychology. This highlights the importance of being mindful of cultural, methodological and contextual biases that can shape the findings in psychological studies, potentially leading to a distorted or incomplete understanding of human behavior.

Activity 40

Research another example of how cultural or methodological biases can influence psychological research. Consider how these biases might limit the generalizability of findings and suggest ways to reduce these biases in future studies.

Causality: How can we know the cause(s) of observed behavior?

To establish the causes of observed behavior, researchers must isolate variables and control external factors through experimental designs. Pavlov's (1927) classical conditioning experiment is a famous example of how controlled conditions can reveal causal relationships in behavior. Pavlov trained dogs to associate a neutral stimulus (a bell) with an unconditioned stimulus (food), eventually causing the dogs to salivate at the sound of the bell alone. This conditioned response occurred because the controlled pairing of the bell and food established a clear cause-and-effect relationship. The experiment's controlled environment ensured that other potential variables, such as distractions or alternative stimuli, did not influence the outcome. While classical conditioning provides a clear understanding of how associations between stimuli lead to learned behaviors, such tightly controlled experiments are not always reflective of real-world conditions, where multiple variables interact to shape behavior. Establishing causality in human behavior, especially in complex environments, often requires sophisticated experimental designs that account for these interactions, while maintaining a degree of ecological validity.

Activity 41

Pick another cognitive psychology experiment. Identify how the researchers controlled variables to establish causality. What were the limitations of their approach in understanding real-world behavior?

Change: How can we know if a behavior is a result of natural maturation or purposeful intervention?

Determining whether behavior is due to natural maturation or purposeful intervention often requires comparing intervention and control groups. A

classic example is Skinner's (1938) operant conditioning experiments, which demonstrated how reinforcement can shape behavior. In these experiments, Skinner placed rats in a "Skinner box" where pressing a lever resulted in food (reinforcement). Over time, the rats learned to press the lever more frequently. To confirm that this behavioral change was due to reinforcement and not maturation, Skinner used control groups that did not receive food after pressing the lever. The difference in behavior between the groups demonstrated that the intervention (reinforcement) caused the change, rather than any natural development in the rats' learning capabilities. This approach, by comparing intervention and control groups, helps to isolate the effects of the intervention, though in real-world scenarios, factors like maturation, social influences and environmental conditions interact in more complex ways, making it harder to attribute behavior changes to a single factor.

Activity 42

Identify another study from the cognitive approach in which the researchers distinguished between the effects of natural maturation and purposeful intervention. How did they control for external variables, and what were the implications? Create a flowchart that illustrates how the researchers differentiated between changes due to natural maturation and those caused by an intervention.

Measurement: How can we express complex psychological constructs in terms of observable, measurable behavior?

In cognitive psychology, abstract constructs such as memory, decision-making and attention are often expressed through observable behaviors. For instance, Tversky and Kahneman (1974) quantified the abstract concept of anchoring bias by asking participants to estimate the percentage of African countries in the UN after being shown a random number. Despite the number being irrelevant, participants' estimates were skewed, showing that their decision-making was influenced by the anchor. The numerical estimates provided a measurable outcome that allowed researchers to quantify the bias. Similarly, Bechara et al. (2000) used the Iowa Gambling Task to measure decision-making abilities. Participants had to choose between "good" and "bad" decks, and their choices provided observable data that reflected their underlying cognitive processes related to risk and reward. By transforming complex mental processes into quantifiable behaviors, researchers can create standardized tasks that allow for objective analysis and comparison of cognitive phenomena, enhancing both the reliability and validity of their findings.

Activity 43

In small groups, research how a specific psychological construct has been operationalized in a study. Explain to your peers the observable behaviors used to measure this construct, and discuss how these methods enhance the reliability of the findings.

Perspective: What are the strengths and limitations of a reductionist approach to studying behavior?

The reductionist approach, which breaks down complex behaviors into simpler components, provides scientific precision but may oversimplify human experience. Cognitive load theory (Sweller, 2011) exemplifies this approach by focusing on how different types of cognitive load (intrinsic, extraneous and germane) impact learning. By isolating these factors, the theory allows for clear, testable predictions about how instructional design can improve learning outcomes. For example, reducing extraneous cognitive load – such as removing distractions – improves learners’ ability to process new information. However, this reductionist approach also has significant limitations. While cognitive load theory effectively addresses the mechanics of memory and learning, it often ignores the broader social, emotional and environmental factors that also affect how people learn. Human behavior is shaped by a complex web of influences, and focusing solely on cognitive processes may miss key variables, such as a student’s emotional state or cultural background. Therefore, while reductionism provides useful insights, it must be balanced with approaches that consider the full range of human experience.

Activity 44

Identify another example of a reductionist study in cognitive psychology. Discuss how breaking down complex processes into smaller components benefited the research, but also what important factors might have been overlooked.

Responsibility: Can potential benefits of research justify partial relaxation of ethical standards?

Ethical standards in psychological research are vital to protect participants, but in some cases, researchers argue that partial relaxation of these standards is justified by the potential benefits. Loftus and Palmer (1974) used deceptive techniques in their study of false memories, where they misled participants by using different verbs (“smashed” versus “contacted”) to describe a car accident. The study found that participants who were exposed to the word “smashed” were more likely to report seeing broken glass, even though no glass was present. This research provided critical insights into the malleability of memory, with important applications in legal settings, such as improving the reliability of eyewitness testimony. However, the use of deception raises ethical concerns, as it can cause emotional distress and erode participants’ trust in research. Ethical guidelines such as informed consent and debriefing help mitigate these risks, but the justification for ethical compromises must always weigh the potential long-term benefits of the research against any harm caused to participants.

Activity 45

Imagine you are part of a Research Ethics Committee evaluating a study you have researched. You can choose one from this chapter and access the full version online, or use an entirely new study. Discuss whether the potential benefits of the research outweighed the ethical concerns, and how the researchers balanced these considerations.

Sociocultural approach

Psychological terminology	Learning objective
Cognitive dissonance	The role of cognitive dissonance in understanding human behavior.
Compliance techniques	The role of one or more compliance techniques in changing human behavior.
Conformity	The process of conformity and its role in understanding human behavior.
Cultural dimensions	The role of one or more cultural dimensions in understanding cross-cultural similarities and differences in behavior.
Emic approach	The value of emic approaches in researching human behavior.
Enculturation	One or more theories of enculturation for one or more behaviors.
Etic approach	The limitation of etic approaches to researching human behavior.
Models of acculturation	The application of one or more acculturation models to explain the experience of immigrants, refugees or other people taking an extended stay in another culture.
Social identity theory	The application of social identity theory to change or explain behavior.
Social learning theory	The application of social learning theory to explain and change behavior.



Table 2.4 Sociocultural approach learning objectives from Subject Guide, pages 25–26.

Introduction to the sociocultural approach

The sociocultural approach to understanding human behavior emphasizes the influence of social and cultural factors on human behavior. This approach has grown out of social psychology, which explores how social environments, interaction and relationships shape individuals. Sociocultural psychologists investigate how culture influences values, beliefs and behavior.

The study of cross-cultural psychology developed using an etic approach to compare how different cultures shape human behavior. An etic approach is a research strategy that emphasizes the objective analysis and comparison of cultures from an external, often global *perspective*. This can be contrasted with an emic approach, which focuses on understanding a culture from within, according to its own norms and values. While the etic approach aims for objectivity and comparability across cultures, it may sometimes overlook the unique aspects and nuances of individual cultures.



However, social psychologists also followed the earlier lead of anthropologists and engaged in an emic approach to research, studying different social and cultural groups from an “insider perspective”, allowing for a deeper and more sensitive understanding of behavior. It is from here that a psychological understanding of Indigenous communities developed into a growing **Indigenous psychology**.

Cognitive dissonance

Cognitive dissonance refers to the state of having inconsistent thoughts, beliefs or attitudes. Cognitive dissonance relates to making behavioral decisions and causing attitude *change*. Cognitive dissonance occurs when a person holds two or more contradictory beliefs, ideas or values, or participates in an action that goes against one of these three, and experiences psychological stress as a result. Individuals feel uncomfortable in a state of dissonance and seek to reduce it, which leads to a motivational *bias* to change thoughts and/or behavior.

It has been assumed that cognitive dissonance is always a negative experience; however, it can actually help to keep individuals mentally healthy. For example, cognitive dissonance can help people to feel satisfied with their choices, especially when the choices cannot be easily reversed, because it makes them justify their choices. Furthermore, resolving dissonance may help prevent individuals from making bad choices and/or motivate them to make good ones.

For example, Festinger and Carlsmith (1959) explored cognitive dissonance through an experiment where 71 male students performed boring tasks and were then paid \$1 or \$20 to tell a confederate (a research actor employed to secretly participate) the tasks were interesting. The study aimed to see if small rewards (\$1) versus larger rewards (\$20) would affect their task–enjoyment ratings. This was assessed by asking participants to tell a waiting confederate that the tasks were really interesting. Almost all of the participants agreed to walk into the waiting room and persuade the confederate that the boring task would be fun. Results showed those paid \$1 rated the task as more enjoyable. This suggests that lower compensation led to greater cognitive dissonance, as participants justified the effort for a minimal reward. In contrast, a \$20 payment provided sufficient external justification, reducing dissonance and allowing participants to rate the task honestly as boring. In this experiment, cognitive dissonance was created in the low-paid condition and so had to be reduced by creating a *bias* that the tasks were more interesting and enjoyable than they really were.



In your exams/assessments, you will be asked to explain or describe a psychological idea or a theory and be expected to provide an example. Make sure you cite a specific behavior and state clearly how it illustrates the idea or theory.



Conceptual question

Cognitive dissonance illustrates how people resolve conflicting beliefs and actions, but how can we know if a change in behavior is truly *caused* by dissonance or influenced by other social or personal factors?

Cognitive dissonance can occur socioculturally when an individual’s deeply held cultural beliefs or practices come into conflict with new cultural norms or values they encounter, for example, through migration or exposure to different cultures via media. For instance someone raised in a culture that highly values collective decision-making might experience cognitive dissonance when moving to a society that prioritizes individual autonomy and decision-making. Collective decision-making refers to a

Sociocultural approach

process in which a group of individuals comes together to discuss, deliberate and reach a consensus or agreement on a particular issue or course of action. This approach emphasizes the values, input and interests of the entire group rather than just one individual. In contrast, individual autonomy refers to the capacity of an individual to make decisions independently, based on personal values, desires and judgment. This approach prioritizes self-reliance, personal freedom and the right to make choices without needing approval or consensus from others. The dissonance arises as the individual struggles to reconcile their ingrained preference for collective action with the new societal emphasis on individual autonomy. This may lead to a re-evaluation of personal beliefs or behaviors in an attempt to reduce the psychological discomfort associated with the conflict.

Activity 46

Prepare scenario cards with situations that might cause cognitive dissonance.

Examples might include:

- a student who values honesty cheating on a test to avoid failing
- a teenager who believes in environmental conservation frequently using plastic bags
- someone who promotes healthy living regularly eating fast food.

On the reverse side of the cards, highlight the common ways people may resolve the cognitive dissonance, such as changing their behavior, changing their beliefs or rationalizing the conflict.

Compliance techniques

A **compliance** technique is a method that attempts to persuade people to comply with a request.

One prominent compliance technique in social psychology is the “foot-in-the-door” technique. This involves first getting a person to agree to a small request, which increases the likelihood that they will comply with a larger request later on. The assumption behind this technique is that agreeing to a small request creates a sense of commitment or obligation within the individual, making them more likely to agree to further requests to maintain this self-image. For example, if someone agrees to sign a petition about a political issue (the small request), they might be more likely to donate money to the cause associated with the petition (the larger request) at a later time. This is because people like to be consistent with their self-image. In this scenario, the self-image that has been created with the small request is: “I am a good person who cares about this issue”. This technique is widely used in marketing, fundraising and persuasion strategies to influence human behavior by capitalizing on the human desire for consistency.

For example, Freedman and Fraser (1966) asked homeowners, first, if they would be willing to place a small sign supporting safe driving in their windows. A few days later, they approached the same homeowners with a much larger request: to place a larger, less attractive sign in their front yards that also promoted safe driving. The results showed that homeowners who had agreed to the small initial request were significantly more likely to comply with the larger request, compared to those who were approached with the larger request first. This study provides empirical support for the effectiveness of the foot-in-the-door technique in increasing compliance with a larger request by first securing agreement to a smaller one.



Several other compliance techniques are commonly identified in social psychology, each leveraging different aspects of human behavior and decision-making.

- **Door-in-the-face technique:** This involves making a large request that is expected to be refused, followed by a smaller, more reasonable request. The contrast between the two requests makes the second seem more acceptable.
- **Low-ball technique:** This involves making an initially attractive offer to obtain agreement and then making the terms less favorable. The individual is likely to comply with the less favorable terms due to the initial commitment.
- **That's-not-all technique:** Before the person makes a decision, an additional item or benefit is added to the original offer to make it look more appealing, increasing the likelihood of compliance.
- **Reciprocity norm:** This involves the social norm that encourages returning favors. If someone does something for you, you are more likely to feel obligated to return the favor.
- **Social proof (consensus):** Individuals are more likely to comply with a request if they believe that others, especially peers or role models, are also engaging in the behavior or agree with the idea.
- **Authority:** This assumes that people are more inclined to follow directions or requests from someone who is perceived as an authority figure, due to social conditioning or respect for expertise.
- **Liking:** This assumes that people are more likely to comply with requests from individuals they like or have a positive association with, whether because of personal relationships, attractiveness or similarities.
- **Scarcity:** This involves highlighting the rarity or limited availability of an opportunity. This can increase compliance because people are motivated by the fear of missing out on something valuable.

Activity 47

Research examples of where corporations use compliance techniques to influence buying decisions. Think of a real-life example where you or someone you know experienced the technique. Share your example with the class and discuss how effective this technique was in that situation. Rank them according to how effective they were, and explain why. Corporations using compliance techniques to influence buying decisions has implications for *responsibility* and how it can be regulated. Furthermore, how might psychologists design studies to *measure* compliant behavior?

Conformity

Conformity refers to the psychological phenomenon whereby individuals adjust their attitudes, beliefs or behaviors to align with the norms or standards of a group, often in response to real or perceived group pressure.

This adjustment is typically driven by a fundamental human need for social belonging and acceptance: human beings have a desire to fit in, be accepted and be perceived as part of a group. The process of conformity highlights the powerful

TOK

A debate within the human sciences is to what extent it is producing valid, useful knowledge. For example, do other areas of knowledge such as the arts provide insight into human behavior that is equally valid?

Do the human sciences and literature provide different types of knowledge about human existence and behavior? Can literature from different cultures provide more insight into human behavior than the often culturally specific human sciences?

Sociocultural approach

influence of social environments and group dynamics on individual actions, decisions and perceptions.

Asch (1951, 1956) investigated the extent to which social pressure from a majority group could influence a person to conform. In his experiments, participants were asked to match the lengths of lines in the presence of confederates who intentionally chose incorrect answers. Asch found that individuals often conformed to the group's incorrect choice, despite clear evidence to the contrary, illustrating the strong influence of group consensus on individual judgments (Figure 2.15).

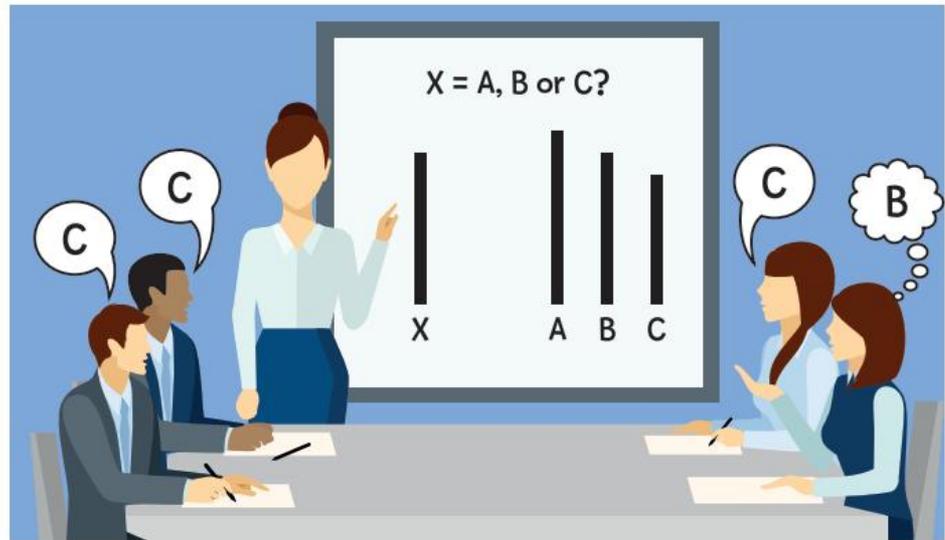


Figure 2.15 The Solomon Asch conformity experiment.

Activity 48

Conformity is heightened in our adolescent years and a normal part of growing up. Looking around your class, where can you see examples of conformity? Does everyone have the same type of shoes, backpack, water bottle, stationary, haircut? Does everyone use the same few slang words or catchphrases? Does everyone listen to the same bands or watch the same media? Where else do you see examples of conformity around you?

Conformity can often be presented as a negative human trait by teachers. Is the role of the human scientist only to describe what the case is or also to make judgments about what should be the case? How might conformity be seen in different cultural contexts?

TOK

It is important not to conflate conformity and compliance: conformity occurs when an individual *changes* their beliefs, attitudes or behaviors to align with the norms or standards of a group; compliance involves changing one's behavior in response to an explicit request or direction from another person. The change in behavior is often temporary and does not necessarily reflect an internal change in beliefs or attitudes. Compliance is driven by the desire to achieve a favorable outcome from a request or to avoid punishment or disapproval for non-compliance; conformity is driven by a desire to fit in or not stand out from the group.



Conceptual question

Asch's research on conformity shows the power of group influence, but can the potential benefits of such research justify the partial relaxation of ethical standards, especially when participants are deceived or pressured?

Activity 49

Discuss these questions.

- Why do people conform to group norms?
- Can you think of situations where conformity is beneficial?
- When might it be important to resist conformity?



Consider the concept of *responsibility*. For example, how do researchers study conformity ethically? Do the results of conformity research like Asch's outweigh the potential costs to participants? What responsibilities do researchers have?

Cultural dimensions

Cultures are made up of a set of attitudes, behaviors and symbols shared by a large group of people and are usually communicated from one generation to the next. Cultural groups are characterized by different norms and conventions, and cultural norms can be assessed according to where they fall on various dimensions.

Cultural dimensions refers to the academic frameworks used to describe and compare the underlying values, behaviors and attitudes that differentiate cultures from one another. These dimensions provide insight into how societies prioritize various aspects of life and interaction, impacting communication, business practices, government policies and individual behavior.

One of the most influential theorists in this area, Geert Hofstede, identified several key dimensions.

- **Power distance dimension:** This dimension refers to the extent to which less powerful members of a society accept and expect power to be distributed unequally.
- **Uncertainty avoidance dimension:** This dimension assesses a culture's tolerance for ambiguity and uncertainty, influencing how strictly rules and regulations are followed to minimize unpredictability.
- **Masculinity vs. femininity dimension:** This dimension assesses a culture's preference for achievement, assertiveness and material reward for success (masculinity) against its preference for cooperation, modesty, and caring for the weak and for quality of life (femininity).

Another dimension is the individualism vs. collectivism dimension.

In individualistic cultures:	In collectivist cultures:
the personal is emphasized more than the social	the social is emphasized more than the personal
individual autonomy and self-expression are encouraged, and people are viewed as unique	individual autonomy and self-expression are not encouraged
individual achievement is prioritized over the achievement of group harmony	the achievement of group harmony is prioritized over individual achievement
competitiveness and self-sufficiency are highly regarded	a person's identity is heavily based on membership of the group
a priority is placed on the goals of the individual	a priority is placed on the goals of important groups (e.g. extended families, work groups)
conformity to group norms is low	conformity to group norms is high

Markus and Kitayama (1991) investigated how **self-construals** differ between individualistic and collectivistic cultures. Self-construals are how individuals define themselves in relation to others: as independent from others or as interdependent with others. Markus and Kitayama found that people in individualistic cultures (for example, the USA) tend to have an independent view of the self, prioritizing personal goals, traits and achievements. In contrast, people in collectivistic cultures (for example, Japan) tend to have an interdependent view of the self, focusing on their roles and relationships within the group, and prioritizing group harmony and collective goals over individual ones.



Japan, often perceived as a highly collectivist society, actually exhibits a unique blend of collectivist and individualist traits. While Japan scores high on collectivism in terms of strong group cohesion and loyalty, it also scores relatively high on individualism compared to other Asian countries. This duality is reflected in Japanese workplace culture, where group harmony and consensus are prioritized, yet personal achievement and responsibility are also highly valued.



Conceptual question

Cultural dimensions provide a way to categorize and compare cultures, but how can we express complex sociocultural constructs, such as power distance or individualism, in terms of observable, *measurable* behavior?

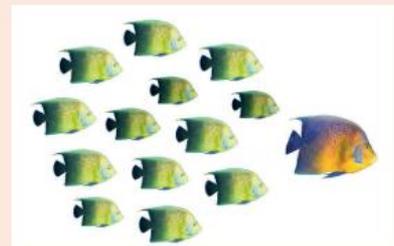
This difference in self-construal influences various aspects of behavior such as communication styles, conflict resolution and decision-making. For instance, in individualistic cultures, direct communication and asserting one's opinion are valued, whereas in collectivistic cultures, indirect communication and maintaining social harmony are prioritized.

However, while the study highlights cultural differences, it also implicitly suggests underlying human universals that transcend cultural boundaries. For instance, regardless of cultural background, all individuals navigate a complex interplay between the need for autonomy (associated more with individualism) and the need for connectedness (associated more with collectivism). Every culture has mechanisms for addressing these fundamental aspects of human experience, albeit in different ways. The similarity lies in the universal human challenge of balancing self-interest with the interests of the group, which all societies must manage. Therefore, the study illustrates that, despite cultural differences in how self-concept is constructed and expressed, the underlying human needs driving these constructions, such as belonging, esteem and understanding, remain consistent across cultures.

Activity 50 (CAS)

Tell a story about this fish. Is it a leader or is it being excluded by the group and chased away? Does this story tell us anything about your natural tendencies to be more individualistic or collectivist?

Search online (for example, on Howstuffworks.com) for a quiz to calculate your individualism and collectivism scores. Consider to what extent personal experiences and differences can be generalized to wider populations.



Emic approach

An emic approach is a research strategy that focuses on understanding cultural phenomena from the *perspective* of the insider, or the member of the culture being studied. An emic approach seeks to understand how members of a culture perceive and categorize the world and explain their own behavior and beliefs according to their cultural norms and values. The emic perspective emphasizes the subjective meanings and interpretations that are significant to the people of the culture.

The value of emic approaches in researching human behavior lies in their ability to provide a deeper, more nuanced understanding of cultural practices, beliefs and behaviors from the perspective of those who live them. By prioritizing the insider's view, researchers can uncover the richness and complexity of cultural contexts that might be overlooked or misinterpreted through an outsider's lens. It is argued that an emic approach helps to avoid ethnocentric *biases* and promotes a more respectful and accurate representation of cultural diversity.

Mesquita and Frijda (1992) explored the cultural norms governing emotional expression, revealing significant differences in how emotions are valued, experienced and expressed across cultures. They found that cultures vary in the emotions they commonly experience and express, influenced by cultural norms and values about what is considered appropriate in different contexts. For example, in the USA and in parts of Europe, expressing happiness and pride openly is often encouraged and viewed positively. These cultures value individual achievement and personal success, leading to a greater acceptance and even expectation of expressing positive emotions like pride and happiness as a reflection of individual accomplishment. However, in East Asian cultures, such as Japan and China, there is a greater emphasis on social harmony, collectivism and modesty. In these contexts, overt expressions of happiness and pride may be more restrained, as drawing attention to one's accomplishments can be seen as boastful or disruptive of group harmony. The cultural norm in these societies leans toward humility and the subordination of personal success for the sake of the group's cohesion. As a result, individuals might downplay their personal achievements and express happiness and pride in a more subdued manner.

Therefore, through an emic perspective, researchers can uncover the deep-seated values of modesty, collectivism and social harmony that influence these behavioral norms. They can explore how individuals interpret these emotions and the social rules surrounding their expression, gaining insights into the cognitive and emotional processes that underlie cultural practices.

Enculturation

Enculturation is the process by which people learn the necessary and appropriate skills and norms of their own culture. Cultural norms are rules or expectations of behavior and thought based on shared beliefs within a specific cultural or social group. Enculturation involves learning cultural norms in terms of what is expected by the other members of the culture. It includes implicit (unwritten) and explicit (written) social norms of how to behave appropriately. Cultural norms are learned by interacting with “gatekeepers” such as parents, media, cultural commentators and schools. This can occur through social cognitive learning theory (observational learning) or direct tuition (being told what you are supposed to do).

TOK

An emic approach is focused on understanding a culture from within, relying on the perspectives, values and meanings that are important to the members of that culture. A researcher who is an insider, or a member of the culture being studied, can bring a deeper, more nuanced understanding of the cultural context, which aligns with the goals of the emic approach. This raises questions regarding to what extent it is legitimate for a researcher to draw on their own experiences as evidence in their investigations in the human sciences.

Enculturation is a process that continues throughout life and reinforces one's identity as a member of one's own culture; it preserves cultural norms from one generation to the next. For example, Odden and Rochat (2004) researched how social cognitive learning theory influences cultural norm development in Samoa by focusing on line fishing and the comprehension of rank and hierarchy. They conducted their research over 25 months in a Samoan village and observed 28 children aged 4–12 within various village life contexts, while also interviewing key figures about their views on child development. Notably, it found that Samoan children learn household chores and fishing primarily through observation rather than direct instruction. By age 12, children were adept at fishing independently, underscoring the significance of observational learning in Samoan enculturation.



One application of this research is that it suggests that such cultural learning practices may pose challenges for Samoan children in North American or European education settings, as these settings can prioritize explicit instruction rather than learning from active engagement and observing social leaders. This highlights the need for educational approaches that respect diverse learning traditions.

TOK

Research into cultural norms raises questions regarding to what extent our perspectives are determined by our membership of a particular culture, and to what extent we are able to allow those perspectives to influence the research process.

Activity 51

Think about your own cultural background. What is something you have learned through the process of enculturation – something you just know how to do and don't question as it is “just the way things are done”.

Etic approach

An etic approach studies human behavior using universal concepts and methods across cultures. It aims to identify cross-cultural similarities and differences through objective, standardized tools. This allows for broad comparisons, but has limitations.

A major issue is that it can impose external categories that do not reflect how people within a culture understand their own behavior. This risks misinterpreting or simplifying complex cultural practices. Etic methods often rely on predefined, Western-based frameworks that may not be relevant in non-Western contexts, leading to *ethnocentric bias*. For example, Hofstede's (1980) cultural dimensions applied a single score to whole

nations, potentially overlooking within-country variation. Such approaches can flatten cultural diversity and fail to reflect regional or generational differences.

Etic research also tends to use quantitative methods like surveys, which may miss the subjective, context-specific meanings of behavior. Cultural differences in interpreting questions, due to language or framing, can further affect validity. As a result, etic approaches may lack cultural sensitivity and miss insights better revealed through emic methods, which focus on understanding behavior from within the culture itself.

Overall, while useful for large-scale analysis, etic approaches can oversimplify cultural complexities and risk distorting findings through outsider assumptions.



Conceptual question

As the etic approach applies universal criteria to compare cultures, how might our knowledge of human behavior be *biased* if we rely too heavily on external perspectives, potentially overlooking unique cultural nuances?

Hofstede's (1980) work on cultural dimensions utilizes an etic approach to examine how work-related values differ across cultures. By surveying employees of IBM in over 50 countries, Hofstede identified several key dimensions of culture, such as individualism vs. collectivism and power distance, that have universal implications for understanding cultural influences on behavior. His research revealed, for example, that in high power distance cultures, such as Malaysia and Guatemala, hierarchical structures are accepted, and inequality among people is considered normal. In contrast, low power distance cultures, like Denmark and New Zealand, tend to value egalitarian relationships and question authority. This etic approach allowed Hofstede to compare cultures on a global scale, providing insights into how cultural norms shape organizational behavior and management practices universally.

Therefore, etic perspectives can uncover broad, cross-cultural trends, offering a comparative lens through which to view human behavior across different societies.

Models of acculturation

Acculturation is the process by which people *change* as a result of contact with other cultures in order to assimilate. Cultural assimilation is the process through which a minority group or culture comes to resemble a majority group or culture. This happens when the minority group is influenced by the values, behaviors and beliefs of the majority group. There are significant ramifications on the food, clothing and language of those becoming part of the majority culture. It should be noted that there is some evidence to suggest that acculturation is actually a two-way process of change: minority groups are influenced by majority groups but majority groups are in turn influenced by minority groups. However, research and theory has primarily focused on the adjustments and adaptations made by minority groups, such as immigrants, refugees and Indigenous people, in response to their contact with a majority group.

At the individual level, acculturation has been linked to changes in daily customs and behavior (those relating to food and clothing, for example) as well as numerous changes in psychological processes such as values and thought processes. The key cognitive processes are attention to and retention of implicit and explicit social

norms, and the motivation to reproduce them, in the process of adopting a new group identity. These affect the formation of attitudes toward cultural norms and the perception of the individual's role within the new culture.

Berry (2001) proposed a four-fold model (Figure 2.16) that assumes that acculturation/assimilation is dependent on minority group attitudes toward maintaining their cultural heritage and their attitudes toward engaging with other cultural groups. "Attitudes" refers to a set of emotions, beliefs and behaviors toward a particular object, person, thing or event. Berry divided acculturation into the following areas.

- Assimilation acculturation: Migrants do not retain links with their heritage culture and only participate in the culture of the receiving society.
- Separation acculturation: Migrants retain links only with their heritage culture and do not participate in the culture of the receiving society.
- Marginalization acculturation: Migrants do not retain links to their heritage culture and do not participate in the culture of the receiving society.
- Integration acculturation: Migrants retain links to their heritage culture and also participate in the culture of the receiving society.

You will learn more about Berry's research, from page 230.

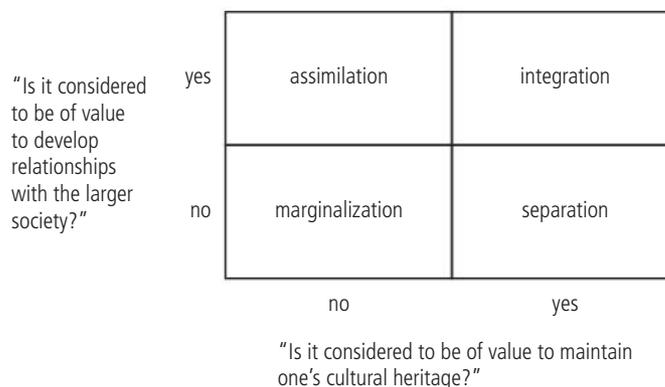


Figure 2.16 Berry's acculturation model.

Kizgin (2015) explored the effect of consumer acculturation on the identity and behaviors of ethnic Turkish immigrants in the Netherlands, using a questionnaire completed by 530 participants. The study *measured* attitudes and behaviors related to private life choices, such as marriage and child-rearing, and cultural practices, including language-use and social interactions. It found that participants who attached importance to having a partner from the heritage culture and rearing children in the heritage culture's traditions favored using their own ethnic language and mostly interacted with people of their own culture. Conversely, participants who attached importance to having a partner from the host culture and rearing children in the host culture's traditions favored using the Dutch language and mostly interacted with people of Dutch origin. Therefore, acculturation attitudes, especially those relating to private life, play a significant role in predicting acculturation behaviors in broader aspects of life.

Kizgin's study aligns with Berry's acculturation model by illustrating how individuals balance heritage and host cultures through their attitudes and behaviors. According to Berry's model, immigrants adopt different acculturation strategies (integration, assimilation, separation or marginalization) based on their attitudes toward

maintaining their original culture and interacting with the host culture. The study shows that those prioritizing heritage culture engage in separation, while those emphasizing host culture lean toward assimilation. The role of private life choices, such as marriage and child-rearing, reflects how personal values shape broader acculturation behaviors.

Activity 52

Think about the unique aspects of your school's culture. Consider daily routines, social norms, traditions and any unwritten rules. Pair up with a classmate and share your thoughts on what new students need to know to fit into your school culture. Discuss key behaviors, values and customs. Consider how students might feel if they did not have the language or did not understand the meaning behind these norms. Furthermore, consider how to gain a valid *measure* of acculturation behavior of new students. How can we be certain it is accurate? What would *responsible* research consider in this situation?

Social identity theory

Social identity theory (SIT), proposed by Tajfel and Turner (1986), suggests that people define themselves in relation to social groups. This occurs via the following processes.

- **Social categorization:** People categorize other people to easily identify them and to begin to understand them. By understanding the categories people belong to, they can better understand themselves and begin to develop their sense of identity. This can explain behavior because it shows how people tend to define behavior as “right” according to their group’s behavior. Individuals usually belong to many groups at the same time and, depending on the group with which they are associating, their behavior is likely to *change* to match the group’s behavior.
- **Social identification:** People tend to assimilate into their group by adopting the group’s identity and behaving in ways that the group members behave. This can explain behavior because it shows how the group becomes the person’s social ingroup.
- **Social comparison:** Once people have categorized themselves within a group, so identifying themselves as members of the group, they tend to compare their group (their ingroup) with respect to another group (their outgroup). This can explain behavior because it shows how people improve their **self-esteem** by thinking of their group members in a positive light.

Furthermore, people also tend to perceive people in other groups (outgroups) negatively. This process can lead to the outgroup homogeneity effect, whereby members of ingroups will perceive members of their own group as being more diverse than an outgroup and members of an outgroup as being more similar to one another.

Park and Rothbart (1982) focused on the outgroup homogeneity effect within sororities at the University of Oregon, USA, examining whether members viewed their own group as more diverse compared to other groups. Sororities are social organizations at colleges and universities, primarily in the USA and Canada. They are the female

counterpart to fraternities, and together these constitute the “Greek system” in student life, which is a prominent feature of the college social scene. Each sorority is usually designated by a combination of two or three Greek letters and has its own symbols, traditions and values that its members adhere to and celebrate. Through questionnaires, around 30 women from each of three sororities evaluated both their own and the other groups based on ten attributes, including behaviors and qualities perceived as either positive or negative. The study found that all three groups viewed their own sorority members as being more dissimilar than the other participants thought they were.

- Participants tended to view partying and being sexually active as unfavorable characteristics.
- For the eight positive characteristics, all groups said that they were more characteristic of their own sorority than the other sororities.
- For the two negative characteristics, ingroup *bias* was shown in two of the sororities as they ranked the negative characteristics as being more characteristic of the other sororities than their own.



Conceptual question

SIT breaks down how individuals align with social groups, but what are the strengths and limitations of this reductionist approach when studying the complexity of group behavior?

Therefore, SIT can be used to explain behavior because it shows the process of ingroup favoritism and outgroup **stereotyping** via outgroup homogeneity on the women’s attitudes toward their own and other sororities.



However, Park and Rothbart’s (1982) study on outgroup homogeneity within sororities raises several questions regarding its methodological quality and findings. The use of questionnaires, while efficient, may have affected the study’s credibility due to potential *biases* in self-reporting, illustrating how types of *measurement* can impact study outcomes. The relatively small sample size, taken from only three sororities, limits

the generalizability of the findings to wider populations. The conclusion, that ingroup members viewed themselves as more diverse and attributed negative characteristics to others, is supported by the data but could be explained by social-desirability bias or self-presentation concerns. Alternative explanations, such as differences in sorority culture, might also account for these results. The practical implications suggest the pervasiveness of bias in social group dynamics, while theoretically, the study reinforces SIT concepts. However, future research should address uncertainties such as how varying social contexts might influence these biases, and whether consistent findings emerge across different types of social groups.

Activity 53

SIT explains how people define themselves based on their group memberships. Think about the various groups within your school, such as sports teams, clubs or social circles. What roles do these groups play in shaping students' identities and experiences? For example, how does being a member of one sports team create possible differences in identity when compared to another sports team.

TOK

Theories provide a framework for understanding human behavior. However, should human science theories be held to the same standards of predictability as natural science theories given that humans may be more unpredictable to study?

Social learning theory

Social learning theory (SLT) (Bandura, 1977) proposes that behavior is modelled by other members of a social group and acquired through observation or imitation based on consequences of a behavior. SLT suggests that behavior is acquired through the following processes.

- **Identification:** Individuals are more likely to learn from observing others they identify with, such as parents, guardians, siblings, peers and celebrities.
- **Modeling:** People learn behavior by observing a role model. For example, a child may learn study habits from modeling an older sibling.
- **Attention:** In order to learn a behavior, the individual must pay attention to the model. Factors that influence attention include the attractiveness or the authority of the model.
- **Retention:** Before an individual can imitate a behavior, the observer must actually remember the behavior that was observed. The more a behavior is viewed, the more likely it is to be remembered.
- **Motor reproduction:** To be able to imitate an observed behavior, the individual has to be physically able to reproduce the behavior. This is influenced by self-efficacy and the extent to which people feel able or have the confidence to carry out the behavior.
- **Motivation:** An individual may remember and be able to carry out the observed behavior, but they may lack the motivation to do so. In order to imitate the behavior, the individual must understand what the potential outcome of repeating the behavior is. This is referred to as outcome expectancies. If the observer witnesses the model being rewarded for the behavior (vicarious reinforcement), they may then carry out the behavior in the belief that they will receive the same reward. Vicarious reinforcement suggests that when an individual observes another person being rewarded or punished for a behavior, it leads the observer to alter their own behavior based on the observed outcome. This type of learning is “vicarious” because the observer does not directly experience the reinforcement or punishment, but rather learns from seeing it applied to someone else.

SLT suggests that portions of an individual's knowledge acquisition can be directly related to observing others within the context of social interactions.

Bandura's SLT provides a robust framework for understanding how behavior is acquired through observation and imitation within social contexts. However, while it assumes that behaviors are learned through processes such as **identification**, modeling and vicarious reinforcement, it does not fully account for the role of innate biological factors in driving behavior. Alternative explanations, such as genetic predispositions and sex-specific differences such as hormonal or neurological influences, can significantly affect an individual's ability to learn or imitate certain behaviors. This suggests that learning is not purely a result of social observation.

A classic example of SLT being applied to explain behavior is aggression. SLT can explain how children may learn aggressive responses if they observe parents, siblings or media characters resolving conflicts through aggression and receiving positive outcomes for such behavior. For example, a boy playing a violent video game with violent male characters might learn aggression through identification with the characters, modeling their behaviors and paying attention to their actions, especially if these characters are perceived as attractive or authoritative. Retention of aggressive behaviors occurs as these actions are repeatedly observed. Motor reproduction might come into play as the boy feels capable of mimicking these actions, influenced by his confidence (Figure 2.17).



▲ **Figure 2.17** Motivation to display aggression in real life could be fueled by the perceived outcomes or rewards seen within a game.

Interventions involve exposing children to models who demonstrate constructive conflict resolution skills. Programs can teach children empathy, communication skills and ways to negotiate or solve problems without aggression, thereby modeling positive social interactions.

The US-based Positive Action program is an evidence-based initiative designed to instill life skills in students from preschool through high school. You will learn more about this on pages 290–291.

Here are further examples of how SLT can explain and then offer ways to help *change* behavior.

- **Health education and promotion:** SLT can explain how individuals adopt health-related behaviors by observing the consequences of actions in others. For example, seeing a family member suffer health issues due to smoking can lead an individual to refrain from smoking. Therefore, health promotion programs often use role models or testimonials to showcase positive health behaviors, such as stopping smoking or leading an active lifestyle. By observing these models, individuals may feel motivated to emulate the behavior, especially if the models are relatable and the outcomes are desirable.
- **Substance abuse prevention:** SLT can explain how teenagers may start misusing drugs or alcohol because they observe peers or influential figures engaging in these behaviors and receiving perceived rewards, such as social acceptance. Therefore, substance abuse prevention programs sometimes include peer leaders or influencers who demonstrate healthy behaviors and the benefits of staying drug- or alcohol-free. By observing these peers, teenagers may learn and adopt the attitudes and behaviors that discourage substance misuse.
- **Academic achievement:** SLT can explain how students often learn effective study habits or become motivated to excel academically by observing peers who study diligently and receive praise or high grades. Therefore, schools and educators can create environments where positive academic behaviors are modelled by peers or teachers. For example, older students might mentor younger ones, showing them effective study strategies and motivating them through their own success stories.

Investigating psychological concepts in the sociocultural approach

Bias: In what way may our knowledge of human behavior be biased?

Our understanding of human behavior is often biased by the cultural frameworks within which research is conducted, especially when using etic approaches. An etic approach, which compares cultures from an outsider's perspective, can introduce bias because it applies universal criteria to culturally unique behaviors. For example, many studies in psychology are conducted in WEIRD societies, which favor individualism. Hofstede's (1980) research on cultural dimensions revealed how such societies prioritize individual autonomy, competition and personal achievement. When researchers apply findings from WEIRD populations to other, collectivist cultures, they risk misinterpreting behaviors that arise from different cultural values. For instance, collectivist cultures emphasize group harmony and social cohesion, where behavior is motivated by relationships and community well-being rather than personal success. Applying individualistic assumptions to such cultures can lead to biased interpretations, limiting the generalizability of findings. This bias reinforces the importance of considering cultural contexts and using emic approaches, which focus on understanding behavior from within a culture's norms and values, reducing the risk of ethnocentrism and providing a more accurate representation of human behavior across diverse societies.



Use relevant technical terminology in your exam answers. Create vocabulary lists to help you memorize the key terms. At the end of your answer, provide a summary sentence that links the explanation to the example and to the question.



Activity 54

Research a cross-cultural study that uses an etic approach. Evaluate how the application of universal criteria may have introduced bias and consider how an emic approach might have yielded different insights.

Causality: How can we know the cause(s) of observed behavior?

Establishing causality in the sociocultural approach requires careful consideration of how social and cultural factors shape behavior. One way to understand causality is through the examination of compliance techniques, which show how external social pressures can lead to changes in behavior. For example, Freedman and Fraser (1966) demonstrated the “foot-in-the-door” technique, through which people first agreed to a small request and were later more likely to comply with a larger one. This study manipulated social interaction and commitment to establish the cause of behavioral change, showing how people’s desire for consistency with their earlier actions led them to comply with subsequent requests. The study’s controlled setting allowed researchers to infer that compliance was a result of the social influence technique rather than other factors. However, in real-world settings, causality may be more difficult to establish, as social behavior is often influenced by multiple interacting factors such as cultural norms, personal values and group dynamics. Nevertheless, by isolating specific social variables, studies like Freedman and Fraser’s help us understand how social pressures and expectations can directly influence human behavior.

Activity 55

Choose a study and critique it for how well it controls for variables. Analyze whether the study’s conclusions about causality are justified. Suggest additional controls or steps that could have been taken to improve the strength of the causal inferences. What are the limitations of applying these findings to broader social contexts?

Change: How can we know if a behavior is a result of natural maturation or purposeful intervention?

To distinguish between behaviors that result from natural maturation and those that are caused by purposeful intervention, researchers often examine how cultural practices shape behavioral development over time. For example, Odden and Rochat (2004) investigated how Samoan children learn cultural norms and skills, such as fishing, primarily through observational learning rather than direct instruction. This form of enculturation was compared with educational systems in countries where direct instruction is more common. By observing the children over 25 months, the researchers concluded that the children’s independent mastery of fishing by age 12 was a result of the cultural practice of learning through observation rather than a natural developmental process that would occur without this cultural influence. This demonstrates that purposeful cultural

intervention – through social learning – can shape behavior, differentiating it from changes that might be attributed solely to maturation. However, in real-world settings, it can be difficult to completely isolate cultural interventions from other factors, such as family dynamics or environmental changes, that also contribute to behavioral development.

Activity 56

Research another study that examines the role of cultural practices in shaping behavior. Create a flowchart that illustrates how the researchers differentiated between changes due to natural maturation and those caused by an intervention.

Measurement: How can we express complex psychological constructs in terms of observable, measurable behavior?

In the sociocultural approach, complex constructs such as acculturation and **identity formation** are often measured through observable behavior and self-reported attitudes. Berry's (2001) model of acculturation, for example, categorizes individuals into four strategies – assimilation, integration, separation and marginalization – based on their interactions with the host culture and maintenance of their heritage culture. To measure acculturation, researchers use questionnaires that assess participants' behaviors, such as language use, social interactions and cultural practices, as well as their attitudes toward their heritage and host cultures. By quantifying these responses, researchers can classify individuals' acculturation strategies and observe how these relate to broader outcomes, such as psychological well-being or social integration. This approach allows researchers to make measurable observations about how cultural interactions influence behavior. Relying on self-report measures can introduce bias, as participants may respond based on social desirability or personal perceptions rather than actual behavior. Still, these tools are valuable for expressing complex sociocultural constructs in a way that can be systematically analyzed and compared across groups.

Activity 57

Choose another sociocultural construct, such as social identity or conformity. Find a study that measures this construct and explain how the researchers turned it into observable, measurable behavior. What tools or methods did they use?

Perspective: What are the strengths and limitations of a reductionist approach to studying behavior?

The reductionist approach, which breaks down complex social behaviors into simpler elements, can provide valuable insights but also risks oversimplifying human experiences. For instance, Hofstede's (1980) cultural dimensions theory reduces cultural behavior to measurable categories such as individualism vs. collectivism, or power distance. This approach allows researchers to compare cultures systematically and identify broad patterns in behavior. However, one limitation is that it may overlook the nuances of how these dimensions play out in real-world contexts. For example, while Hofstede's framework categorizes cultures as either individualistic or

collectivistic, many societies exhibit a mix of both traits, depending on context, social groups or personal situations. In Japan, for instance, while collectivist values like group harmony are prioritized, there are also strong individualistic elements in certain aspects of life, such as professional achievement. The reductionist approach provides a useful framework for cross-cultural comparisons but can miss the complexity and fluidity of cultural experiences. Thus, while reductionism offers clarity, it must be balanced with holistic approaches that capture the richness of human behavior.

Activity 58

Identify another example of a reductionist study in sociocultural psychology. Discuss the benefits of simplifying complex social behaviors for research purposes, but also consider what important cultural or social factors might be overlooked.

Responsibility: Can potential benefits of research justify partial relaxation of ethical standards?

In sociocultural psychology, ethical dilemmas often arise when research involves social manipulation or deception. For example, Asch's (1951) study on conformity involved placing participants in a situation where they had to choose between conforming to a group's incorrect answer or standing by their own judgment. The study revealed critical insights into how social pressure influences conformity, highlighting the powerful role of group dynamics in shaping behavior. However, the ethical issue lies in the deception used, as participants were misled about the true nature of the experiment and could have experienced distress when realizing that they conformed to an incorrect group answer. While the study's findings have been influential in understanding social influence, researchers must carefully consider the ethical implications of manipulating participants in such ways. The potential benefits of the research – advancing knowledge of social influence – must be weighed against the psychological harm participants may experience, and ethical guidelines such as informed consent and debriefing are important for balancing these concerns.

Activity 59

Imagine you are part of a Research Ethics Committee evaluating a study you have researched. You can choose one from this chapter and access the full version online, or use an entirely new study. Discuss whether the potential benefits of the research outweighed the ethical concerns, and how the researchers balanced these considerations.

Research methodology

Research methodology	Related terms	Learning objective
Data analysis and interpretation	<ul style="list-style-type: none"> • Bar graph • Box and whisker plot • Distributions (e.g. normal, skewness) • Frequency table • Histogram • Line graph • Outliers • Scatterplot • Descriptive statistics • Inferential statistics • Correlation coefficient • Thematic analysis 	<ul style="list-style-type: none"> • Data is represented and analyzed in different forms based on the design of the study and the nature of the data. • Analyze and interpret different types of data tables, graphs and results. • Analyze and interpret descriptive and inferential statistics. • Understand the stages of thematic analysis to uncover patterns in textual data that are then grouped into themes that are relevant to the aim of research engaging in thematic analysis.
Research considerations	<ul style="list-style-type: none"> • Reliability • Validity (internal, external, content, face, construct) • Generalizability • Researcher and participant biases • Reflexivity • Transferability • Credibility 	<ul style="list-style-type: none"> • Factors that should be considered when generalizing findings to another population or context. • The role of reflexivity and the process of checking for unconscious bias. • Factors that should be considered when transferring findings of a study to another population or context and the steps to ensuring credibility in research. • Strategies for ensuring the credibility of research.
Research methods	<ul style="list-style-type: none"> • Experiments (true or quasi-) • Observations (naturalistic or controlled, overt or covert, participant or non-participant) • Surveys/questionnaires • Interviews (structured, semi-structured or focus group) • Correlational studies • Case studies 	<ul style="list-style-type: none"> • Differentiate between the different types of research methods. • The appropriate selection of research methodology to investigate a psychological question. • The advantages and disadvantages of different research methodologies. • The potential effects of ethical considerations on psychological research. • The role of external variables in drawing conclusions about causality.
Sampling techniques	<ul style="list-style-type: none"> • Self-selected • Opportunity • Stratified • Random • Snowball 	<ul style="list-style-type: none"> • The advantages and disadvantages of different sampling techniques.

Table 2.5 Research methodology learning objectives from Subject Guide, pages 26–27.

Introduction to research methodology

Research methodology – which in DP Psychology is organized as research methods, sampling techniques, procedures, and data collection and analysis – threads throughout the course and is the focus of the class practicals. You will develop an understanding of research methodology, from the practical and theoretical background framing the choice of research methodology to decisions made regarding data analysis and interpretation. All of the concepts, but particularly *bias*, *causality* and *measurement*, can be further understood through research methodology explored within each context and are relevant to the biological, cognitive and sociocultural approaches.

TOK

The various methods in psychology raise questions regarding the assumptions that underlie the methods used in the human sciences and how they may impact knowledge. For example, if we assume that we are influenced by our own thoughts and feelings then researchers may be less inclined to look for causal relationships between behavior and external variables. However, if the opposite is assumed then researchers will look for causal events and treat humans as stimulus-response organisms in much the same way that many animals are viewed.



Data analysis and interpretation



Conceptual question

What *biases* may be present during data analysis and interpretation of human behavior? Why is it important to consider potential biases that might arise during data analysis? Can findings from psychological research ever be free from bias?

Bar graphs

A **bar graph** is a visual representation used to compare and contrast the quantities, frequencies or other *measures* of different categories or groups. In psychology, bar graphs are often used to display data collected from experiments, surveys or observational studies. The bar chart usually shows the independent variable (IV) along the base (*x*-axis) and the dependent variable (DV) up the side (*y*-axis), with the height of the bars indicating the mean score. Each bar represents one condition of the IV.

Bar graphs are particularly useful in psychology for illustrating differences in behavior, responses or psychological states across different conditions or among various groups of participants. They make complex data more comprehensible and can highlight significant trends or differences that are important for understanding psychological phenomena. For example, when researchers want to compare the efficacy of treatments for mental health disorders and communicate those findings to the public, a simple bar graph can be effective.

However, issues with interpretation from bar graphs include the potential for misleading visual representation and difficulty in comparing data accurately. Furthermore, the bar widths or spacing can vary, which may distort the viewer's perception of the data, and the use of inappropriate scales or axis manipulation can exaggerate or downplay differences between categories.

Box and whisker plots

Box and whisker plots, also known simply as box plots, are a type of statistical graph used to display the distribution of a dataset (Figure 2.18). In psychology, box plots can be particularly useful for visualizing the spread and central tendency of psychological *measures*, such as test scores, reaction times or survey responses, across different groups or conditions.

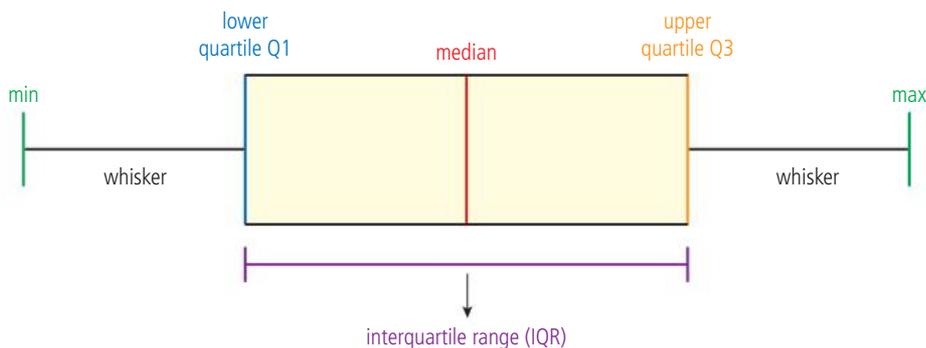


Figure 2.18 A box and whisker plot.

A box plot represents five summary statistics: the minimum, the first quartile (Q1), the median (the second quartile, Q2), the third quartile (Q3) and the maximum. The “box” part of the plot shows the interquartile range (IQR), which is the distance between the first and third quartiles and contains the middle 50 percent of the data. The line within the box marks the median, providing a visual indicator of the data's central tendency. The “whiskers” extend from the box to the minimum and maximum values, excluding outliers, which are sometimes plotted as individual points outside the whiskers.

Box plots are useful in psychology for comparing the distributions of data across multiple groups or conditions without making assumptions about the underlying statistical distribution. They are particularly effective for identifying outliers, understanding the spread of the data and seeing whether the data is skewed. For example, in a study comparing stress levels across different professions, box plots could visually illustrate not just the average stress level per profession, but also the variability and range, offering deeper insights into the data distribution than mean values alone.



Conceptual question

In research, psychological constructs such as stress or happiness are complex. How can we *measure* these abstract concepts accurately through observable behavior and reliable data?

Issues with interpretation from box and whisker plots include the potential for misunderstanding the spread of data and difficulty in identifying individual data points. Furthermore, outliers can be misinterpreted or missed, and the quartile boundaries may not fully represent the complexity of data distribution, especially with small datasets.

Distributions

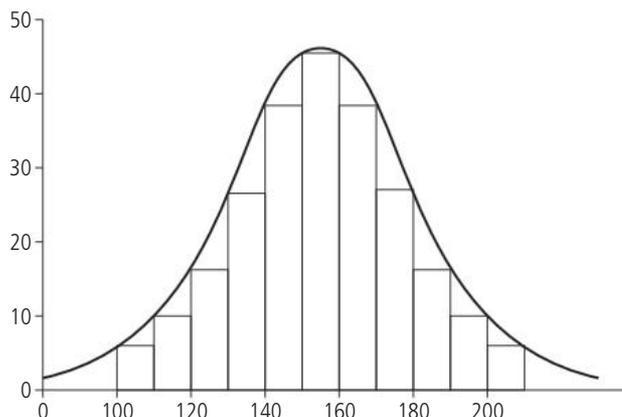
Distributions in statistics describe how the values in a dataset are spread out. Distributions are important for understanding the patterns and tendencies in psychological data, such as behavioral responses, test scores or survey results.

Issues with interpretation from distributions include the challenge of correctly identifying the type of distribution and assessing the impact of **skewness**. Furthermore, normal distributions may be assumed when data is skewed, leading to incorrect conclusions, and the tails of skewed distributions may be misrepresented or overlooked. For example, in a right-skewed distribution, extreme values in the upper tail may be downplayed, causing the average to seem lower than it truly is, and in a left-skewed distribution, the long lower tail may obscure the central tendency. Each of these can lead to misleading interpretations of the data's spread.

Therefore, two key aspects of distributions that are particularly important in psychological research are normal distribution and skewness.

- **Normal distribution:** This is also known as the bell curve due to its bell-shaped appearance (Figure 2.19). A normal distribution is symmetric, with the bulk of the values clustered around a central mean, and probabilities for values further from the mean tapering off equally in both directions. In psychology, many psychological traits, such as IQ scores or standardized test results, are assumed to be normally distributed within the population.

Figure 2.19 A graph showing normal distribution.



- **Skewness:** This refers to the degree of asymmetry of a distribution. A distribution is skewed if one tail is longer or fatter than the other. Skewness

can be positive or negative: positive skew means the tail is longer on the right side of the distribution, indicating that there are a number of exceptionally high values; negative skew means the tail is longer on the left side, indicating a number of exceptionally low values (Figure 2.20). For example, in a study measuring depressive symptoms, a positively skewed distribution might indicate that while most participants have low symptom levels, there is a small number with significantly higher levels of depression. In such a case, the mean (average) score may be pulled higher by these few extreme cases, while the median remains lower, closer to the majority of participants. This could lead to an overestimation of the overall depressive symptoms in the population if only the mean is considered. For instance, if the mean score is 15, but the median score is 8, it shows that the majority have mild symptoms, with a few outliers driving the mean upward.

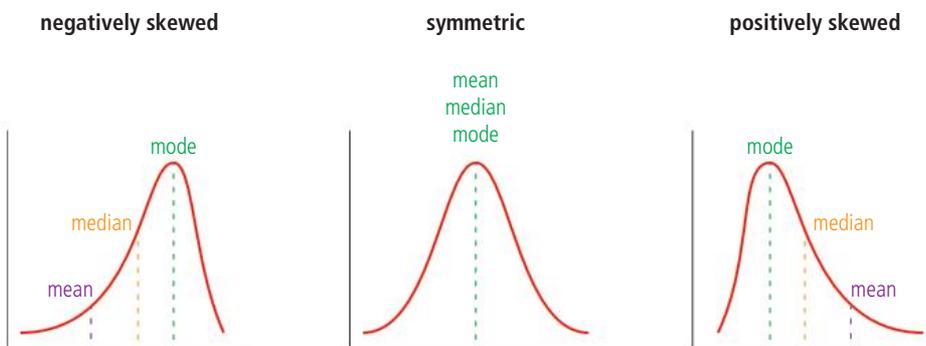


Figure 2.20 Skewness.

Frequency tables

Frequency tables organize and summarize data by displaying the frequencies (counts) of various outcomes in a dataset. In psychology, frequency tables are particularly useful for categorizing and simplifying complex data, making it easier to identify patterns and trends within the data collected from experiments, surveys or observational studies. A frequency table lists the categories of data in rows, and the number of occurrences in columns.

For example, in a psychological study investigating stress levels among college students, a frequency table might categorize students into different stress levels (low, medium, high) based on their responses to a stress questionnaire. The table would then display the number of students in each category, providing a clear overview of the distribution of stress levels within the student population (Table 2.6).

	Stress level		
	Low	Medium	High
Number of students	20	32	15

Table 2.6 Example of a frequency table, showing stress levels in a student population

Frequency tables serve several functions in psychological research.

- **Simplification:** Frequency tables condense large datasets into a more manageable and understandable format.

- **Visualization:** Although not graphical themselves, frequency tables lay the groundwork for creating bar graphs, pie charts and other visual representations.
- **Analysis:** Frequency tables facilitate the calculation of statistical measures, such as means, modes and standard deviations, and help identify the most or least common responses by organizing data categorically.

Issues with interpretation from frequency tables include the potential for overwhelming data presentation and lack of visual cues. Furthermore, large datasets may be difficult to interpret, as patterns can be obscured, and without visual representation, relationships between categories may not be immediately clear.

TOK

What type of interpretations can researchers make about human behavior from statistics alone? Can researchers draw conclusions about human behavior just from quantitative evidence?



Conceptual question

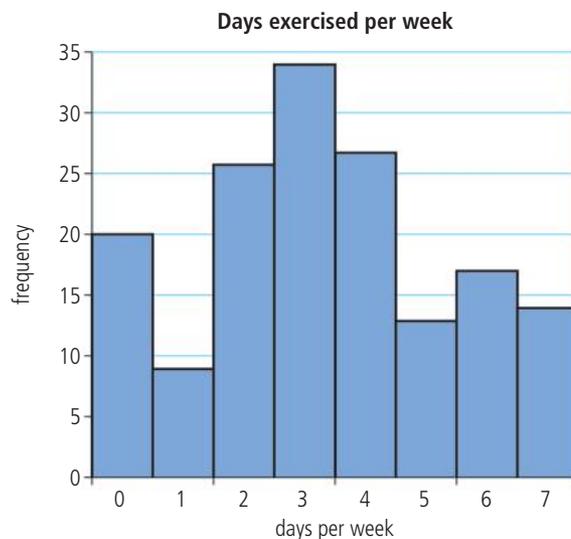
How does the use of numbers, statistics, graphs and other quantitative instruments of *measurement* affect the way knowledge in the human sciences is valued?

Histograms

Histograms are a type of graphical representation used to illustrate the distribution of numerical data through a series of bars. In psychology, histograms are useful for showcasing the frequency of scores within continuous intervals or bins, making them particularly suited for examining the distribution of psychological *measures* like reaction times, survey scores or age ranges of participants.

For example, Figure 2.21 shows how frequently people exercise during a week. It shows that most people exercise around three to four days per week.

Figure 2.21 A histogram showing how frequently people exercise in one week.



Unlike bar graphs, which display categorical data with separate bars, the bars in a histogram touch each other, emphasizing the continuous nature of the data. Each bar in a histogram represents the frequency (count) or relative frequency (proportion) of data points within a specific range or bin, with the area of the bar indicating the number of observations it contains. The shape of the histogram, whether it is symmetrical or skewed, or exhibits any other pattern, provides insights into the distribution of response times among participants.

Histograms serve several functions in psychological research.

- Understanding distributions: Histograms provide a visual representation of the data distribution, helping to identify patterns such as normality, skewness or bimodality (having two modes).
- Identifying outliers: The visual nature of histograms makes it easier to spot anomalies or outliers in the data (see page 92), which could indicate measurement errors or special cases.
- Comparing groups: Histograms can also be used to compare distributions across different groups or conditions, albeit one variable at a time.

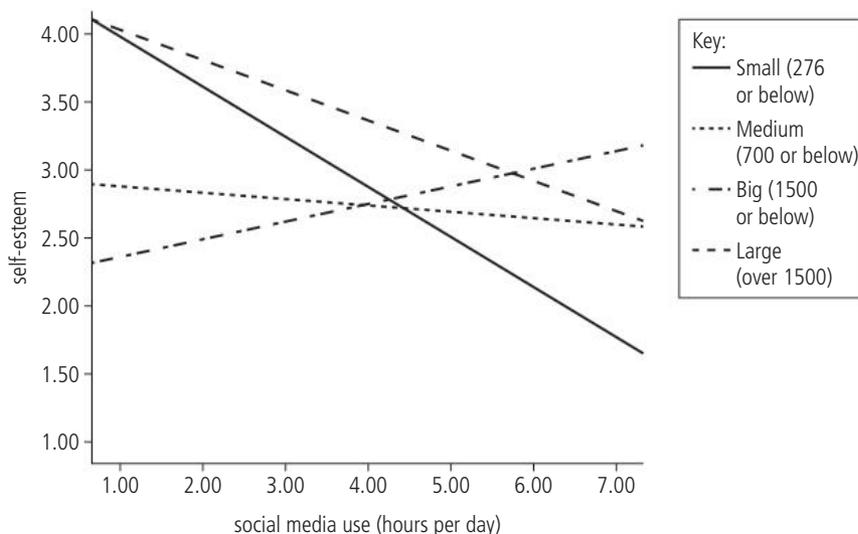
Issues with interpretation from histograms include the sensitivity to bin size and the potential for misleading data grouping. Furthermore, the choice of bin width can either hide important patterns or create artificial ones, and unequal bin widths may distort the actual frequency of data points.

Line graphs

Line graphs are a type of chart used to display information as a series of data points called “markers” connected by straight line segments. In psychology, line graphs are useful for illustrating *changes* or trends over time within continuous data, making them ideal for longitudinal studies, treatment effects over time or developmental trends across different age groups.

Each point on the graph represents the value of a psychological *measure* at a given time or condition, with the *x-axis* typically representing time or sequential conditions (for example, pre-test, post-test), and the *y-axis* representing the variable of interest (for example, stress levels, cognitive performance). The connecting lines help to visualize the direction and rate of change between consecutive data points, offering insights into patterns such as increasing, decreasing or cyclical trends.

For example, Figure 2.22 shows the effect of social media use on self-esteem. It shows how increasing social media use leads to a decrease in self-esteem.



Moderation of social network size on social media use and self-esteem (N = 109).



Read the article ‘The moderating role of social network size on social media use and self-esteem: An evolutionary mismatch perspective’ by Lim, Lau and Li for an example of how change in psychology can be measured and shown by graphs.

Figure 2.22 A line graph showing the effect of social media use on self-esteem.

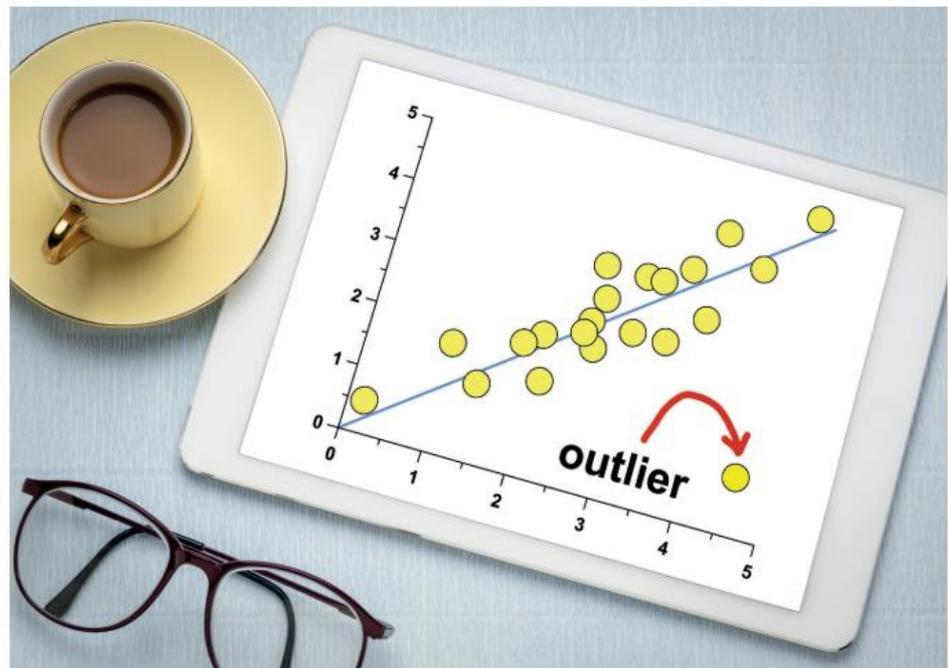
Line graphs serve several functions in psychological research.

- Tracking changes over time: Line graphs are ideal for showing how psychological measures evolve, highlighting trends and changes across different time points or conditions.
- Comparing different groups: Line graphs can compare changes in multiple groups over time, such as comparing treatment versus control groups in an intervention study, by plotting multiple lines on the same graph.
- Visualizing interactions: Line graphs help in understanding complex interactions between variables, such as how the effect of one variable may change over different levels of another variable.
- Facilitating interpretation: Line graphs make it easier for researchers to interpret their findings and for audiences to understand the results by providing a clear and straightforward visualization of data trends.

Issues with interpretation from line graphs include the potential for over-smoothing trends and misreading fluctuations. Furthermore, connecting data points with lines may imply continuous relationships where none exist, and outliers or short-term variations may be exaggerated or overlooked if the scale is not appropriate.

Outliers

Outliers are data points that significantly deviate from the majority of a dataset, appearing either much higher or lower than the surrounding values (Figure 2.23). In psychology, identifying and understanding outliers is important because they can have a profound impact on the interpretation of research findings, affecting statistical analyses, conclusions and theoretical implications.



▲ **Figure 2.23** An outlier shown on a scatterplot.

The presence of outliers can arise from a variety of sources, such as *measurement errors*, data entry mistakes or true individual differences that are unusually extreme

compared to the rest of the data. For example, in a study measuring attention spans, an outlier might represent a participant with an exceptionally high or low attention span compared to the general population being studied.

Outliers serve several functions in psychological research.

- **Data cleaning and verification:** Identifying outliers is an important step in data preprocessing, helping researchers to verify data accuracy and decide whether to exclude, include or adjust outlier data points based on their source and impact.
- **Statistical analysis:** Outliers can heavily influence statistical measures, such as means and standard deviations, and can affect the outcomes of statistical tests, potentially resulting in misleading conclusions. For instance, a few extreme values can skew the results of correlation analyses or t-tests.
- **Understanding participant diversity:** In some cases, outliers reflect genuine variations in human behavior or psychological states, offering insights into the full range of human experiences and characteristics. These outliers may highlight the need for further study or suggest modifications to theories to accommodate diverse psychological phenomena. They may even focus the researcher on particular individuals or variables that warrant further study.

Handling outliers requires careful consideration; researchers must decide whether to retain, exclude or somehow adjust these data points based on the research context and the nature of the outliers. This decision-making process involves balancing the integrity of the data with the goals and theoretical underpinnings of the study. Therefore, properly managed, outliers can provide valuable insights into the data, revealing unexpected patterns or prompting new hypotheses about psychological processes.

Scatterplots

Scatterplots are graphical representations that display the relationship between two continuous variables, plotting each data point on the *x*-axis and the *y*-axis based on its values for these variables. In psychology, scatterplots are useful for visually exploring and presenting the nature of the relationship between psychological variables. The overall pattern of the points on the plot can reveal different types of relationships, such as positive correlations (where increases in one variable are associated with increases in the other), negative correlations (where increases in one variable are associated with decreases in the other) or no correlation (Figure 2.24).

The following are examples of correlations in human behavior.

- **Physical activity and mental health:** Increased levels of physical activity are often correlated with lower levels of anxiety and depression.
- **Sleep duration and cognitive performance:** Longer sleep duration tends to correlate with improved memory and cognitive functioning.
- **Social media use and self-esteem:** Excessive social media use has been correlated with lower self-esteem, especially among teenagers.
- **Education level and income:** Higher education levels are typically correlated with higher income and greater employment opportunities.

TOK

Outliers raise questions regarding to what extent they represent a pattern in a wider population or are more unique to individuals. How can we be certain that generalizing results to a wider population accurately reflects all human behavior?

- Stress and physical health: High levels of chronic stress are often correlated with an increased risk of health issues such as heart disease and weakened immune function.

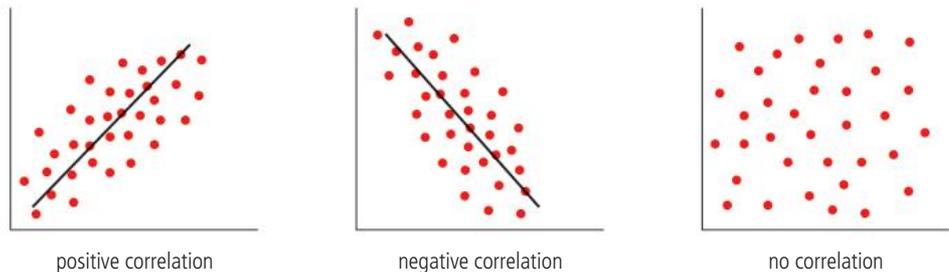


Figure 2.24 Correlations shown on scatterplots.

Scatterplots serve several functions in psychological research.

- Identifying relationships: Scatterplots are key in the initial exploration of potential relationships between variables; they provide a visual means to assess the strength, direction and form of these relationships.
- Outlier detection: Scatterplots allow researchers to identify outliers in the data that may influence the analysis or indicate special cases.
- Assumption checking: In statistical modeling, scatterplots help in checking assumptions such as linearity and homoscedasticity (uniform variance) across the range of variables.

Scatterplots provide a straightforward and intuitive means to uncover insights into psychological variables, laying the groundwork for further statistical analysis and theory development.

Issues with interpretation from scatterplots include the potential for over-interpreting correlations and difficulty in identifying trends with dense data. Furthermore, the presence of outliers can distort the perceived relationship between variables, and in cases of too many data points, the scatterplot may become cluttered, making it hard to detect meaningful patterns or trends. For example, a scatterplot showing a loose clustering of points might misleadingly suggest a weak correlation, even when outliers are pulling the data away from a more defined trend.

Correlations should be interpreted with caution. For example, here are some dubious examples of correlations in human behavior.

- Ice cream sales and violent crime rates: Both tend to rise during the summer months, but the relationship is likely due to the increased heat and outdoor activity, not a direct cause-and-effect link.
- Caffeine consumption and academic performance: Students who consume more caffeine may perform better academically, but this could be due to other factors such as studying more or staying up later, rather than caffeine itself improving performance.

- Internet use and loneliness: Higher internet use has been correlated with feelings of loneliness, but it is unclear whether internet use causes loneliness or if lonely people are more likely to spend time online.

Activity 60

For each of the following, write a one-sentence definition and summary explaining why they are useful in human science research: bar graphs, box and whisker plots, distributions (for example, normal, skewness), frequency tables, histograms, line graphs, scatterplots.

As an extension activity, consider how statistics influence our perspective on the causes of human behavior? To what extent can data analysis provide valid explanations of human behavior?

Descriptive statistics

Descriptive statistics summarize a given dataset, which can be either a representation of the entire population or a sample of it. In psychology, descriptive statistics play a critical role in describing and understanding the basic features of data collected from research studies, surveys, experiments and observations. It provides simple summaries about the sample and the *measures*, offering a way to present the fundamental properties of psychological data without making assumptions (or inferences) about it.

The primary components of descriptive statistics include measures of central tendency, variability and distribution shape.

- Measures of central tendency: These include the mean (average), median (middle value) and mode (most frequently occurring value). In psychological research, these measures help researchers understand the central point around which data points are distributed, indicating the typical or average response, behavior or characteristic within a group.
- Measures of variability (or spread): These include the range (difference between the highest and lowest values), variance (average of the squared differences from the mean) and standard deviation (square root of the variance). These measures provide insights into the diversity or homogeneity of the data, revealing how spread out the data points are from each other and from the mean.

Descriptive statistics serve several functions in psychological research.

- Summarization: Descriptive statistics condense large volumes of data into a few summarizing measures, making complex datasets understandable at a glance.
- Comparison: Descriptive statistics allow for the comparison of different groups or conditions within a study, facilitating insights into psychological phenomena.
- Data cleaning and quality check: Descriptive statistics are used to identify anomalies or outliers in the data, which could indicate errors in data collection or entry.
- Foundation for inferential statistics: Descriptive statistics provide the groundwork for further statistical analysis, including inferential statistics, which are used to generalize from the sample to the population.

Activity 61

Try some of these in groups.

1. Hours of sleep per night

- **Activity:** Track how many hours each of you sleep each night for a week. At the end of the week, share and compare the data.
- **Calculations:**
 - **Mean:** Add up all the hours of sleep you get for the week, then divide by the number of days (7 days).
 - **Median:** Organize your sleep hours from lowest to highest and find the middle value.
 - **Mode:** Identify which number of sleep hours occurs most often.
 - **Range:** Subtract the shortest sleep duration from the longest one.
 - **Variance/standard deviation:** Calculate how far your sleep hours are from the average (mean), and find the standard deviation to see how spread out your data are.

2. Time spent on homework

- **Activity:** Track how many minutes each of you spends on homework each day for a week. Gather the information and analyze it together.
- **Calculations:**
 - **Mean:** Add all the minutes spent on homework for the week and divide by 7.
 - **Median:** Line up the times you spend on homework from smallest to largest and find the middle value.
 - **Mode:** Identify which homework time occurs the most frequently.
 - **Range:** Subtract the smallest amount of time spent on homework from the largest.
 - **Variance/standard deviation:** Measure how much your homework times vary from the average, and calculate the standard deviation to see how consistent you are.

3. Daily screen time

- **Activity:** Track how many hours you spend using electronic devices (phones, computers, etc.) each day for a week. Compare everyone's screen time data at the end of the week.
- **Calculations:**
 - **Mean:** Add up all the hours of screen time for the week and divide by 7.
 - **Median:** Arrange your screen times from lowest to highest and find the middle value.
 - **Mode:** Identify which number of hours you spend on devices occurs the most.
 - **Range:** Find the difference between the longest and shortest screen times.
 - **Variance/standard deviation:** See how spread out your screen times are from the average, and calculate the standard deviation to understand the variability.

4. Steps walked per day

- **Activity:** Use a fitness tracker or your phone to count how many steps you take each day for a week. Compare the results to see how active everyone is.
- **Calculations:**
 - **Mean:** Add up your total steps for the week and divide by 7.
 - **Median:** Organize your step counts in order and find the middle number.
 - **Mode:** Identify which step count occurs most frequently.
 - **Range:** Calculate the difference between the highest and lowest number of steps.
 - **Variance/standard deviation:** Calculate how much each day's step count differs from your average, then find the standard deviation to see how much variation there is in your activity levels.

Inferential statistics

Inferential statistics are a set of methods used to generalize from a sample to a population. They allow researchers to draw conclusions (inferences), make predictions and test hypotheses based on sample data. In psychology, inferential statistics extend findings from a specific group of study participants to a broader population, thereby providing evidence for psychological theories and principles.

Inferential statistics involve estimating population parameters (for example, means, proportions) based on sample statistics, and assessing the reliability of these estimates through confidence intervals and hypothesis testing. The following are key components and techniques in inferential statistics.

- **Hypothesis testing:** This involves making assumptions about a population parameter and then using sample data to test whether these assumptions are likely to be true. Common tests include t-tests, ANOVAs, chi-squared tests and the Mann–Whitney U test, each being suited for different types of data and research questions. In statistics, a population refers to the entire group of individuals or observations that a researcher is interested in studying, which could range from the entire population of a country to all the leaves on a particular tree, depending on the research question. Parameters are characteristics of this population, such as the mean (average), median (middle value), variance (*measure* of variability), or proportion (percentage of the population with a particular characteristic).
- **Confidence intervals:** A confidence interval provides a range of values within which the true population parameter is expected to lie, with a certain level of confidence (for example, 95 percent confidence interval). This offers a measure of the estimate's precision and reliability.

Activity 62

Estimate the average height in your class.

Step 1: Data collection

Measure your heights in centimeters and record the results. This will form the dataset for the activity.

Step 2: Sample selection

In groups, randomly select five classmates to form a sample. You can use a random number generator or draw names from a hat to ensure the selection is unbiased.

Step 3: Calculate the sample mean

Once your sample has been selected, calculate the mean height by adding up the heights of the five students in your sample and dividing the total by 5. This will give you an estimate of the average height for the entire class.

Step 4: Introducing confidence intervals

The sample mean is just an estimate of the true average height of the class, but it is not guaranteed to be exact. A confidence interval shows how close your estimate is likely to be to the true average. Instead of using complex formulas, you can create a 95 percent confidence interval by adding and subtracting a simple margin of error from your sample mean. This margin is based on the variation in your sample and the number of students measured. To calculate the margin of error, you can use the following simplified steps.

- **Estimate the standard deviation:** Use the heights in your sample to calculate how spread out the values are from the mean. This gives you an idea of the variation within your group.
- **Divide the standard deviation by the square root of your sample size:** This step adjusts for the fact that a larger sample gives more reliable results. Since you are using a small sample, this calculation helps account for that.
- **Multiply by the Z-score for a 95 percent confidence level (1.96):** This value corresponds to the level of confidence you want (in this case, 95 percent).

Finally, add and subtract the margin of error from your sample mean to create the range for your confidence interval. This interval shows that you are 95 percent confident that the true average height of the class falls within this range.

For example, a student partially replicated Loftus and Palmer's (1974) experiment to investigate how the emotional intensity of a leading verb influences memory recall, specifically regarding speed estimates in a car accident. The experiment used an **independent measures** design, with participants exposed to the verbs "smashed" or "contacted" in the critical question asking them to estimate the speed of cars in a video that were crashing. Descriptive statistics showed that the mean speed estimate was higher for "smashed" (46.5 mph) than for "contacted" (34.3 mph), supporting the hypothesis that more intense verbs lead to higher speed recollections. The standard deviation for "smashed" (14.15) was also higher, indicating greater variability in responses compared to "contacted" (8.12). However, the key role of inferential statistics was to allow researchers to make inferences regarding to what extent the participants were influenced by the verbs.

Inferential statistics were applied using the Mann–Whitney U test, which is used to determine whether there is a significant difference between two groups when the data is ranked or ordinal. The test compares the speed estimates from participants who saw the verb "smashed" with those who saw the verb "contacted". Inferential tests often have values known as observed values and critical values. In this test, the observed value is the result calculated from the data, while the critical value is a threshold

number based on probability tables. If the observed value is smaller than the critical value, it means the difference between the two groups is significant, and the null hypothesis (which suggests no difference between the groups) can be rejected.

In this study, the observed value was 22, and the critical value was 23. Since 22 is smaller than 23, the researchers were able to reject the null hypothesis, meaning the difference in speed estimates between the two groups was statistically significant. This suggests that the verb “smashed” created a stronger, more intense memory of the crash, leading participants to recall higher speeds, supporting the idea that the way a question is phrased can influence memory (schema theory).

Furthermore, to demonstrate causality, the study must show that changes in the independent variable (IV) (in this case, the verb used in the critical question (“smashed” or “contacted”)) directly cause changes in the dependent variable (DV), which is the speed estimate provided by participants. The researchers controlled for external factors by using the same video and randomizing the assignment of verbs, ensuring that any differences in speed estimates were due to the verbs’ emotional intensity rather than other variables.

Inferential statistics, such as the Mann–Whitney U test, play a key role in establishing causality by determining whether the observed differences between groups are statistically significant or simply due to chance. In this study, the test compared the speed estimates between participants exposed to the different verbs. By calculating the observed value and comparing it to the critical value, the researchers were able to reject the null hypothesis, showing that the differences were not random but caused by the emotional intensity of the verb.

This statistical significance strengthens the case for a causal relationship because it rules out random variation as the explanation for the difference in speed estimates. It allows the researchers to conclude that the use of more emotionally intense verbs like “smashed” directly influenced participants’ memories, leading them to recall higher speeds, thus demonstrating causality between the IV (verb choice) and the DV (speed estimate).

Inferential statistics serve several functions in psychological research.

- **Generalization:** Inferential statistics allow researchers to infer patterns, effects or relationships observed in a sample to the broader population, thus validating the universality of psychological phenomena.
- **Hypothesis testing:** Inferential statistics enable the testing of theoretical predictions against empirical data, supporting or refuting psychological theories.
- **Decision making:** Inferential statistics guide researchers in making informed decisions about the validity of their findings by providing methods for assessing the reliability and significance of results.
- **Quantifying uncertainty:** Inferential methods quantify the degree of uncertainty associated with conclusions drawn from sample data, offering a scientific basis for drawing inferences about population parameters. Examples include:
 - **Behavioral intervention effectiveness:** A psychologist conducts a study to determine if a new therapy reduces anxiety in a group of teenagers. The sample shows a reduction in anxiety scores, but inferential statistics (like confidence intervals) helps to quantify how much uncertainty exists in generalizing this result to all teenagers. A 95 percent confidence interval might indicate that, while the sample showed an average reduction of 5 points, the true reduction in the broader population could range between 3 and 7 points.

- Sleep deprivation and cognitive performance: A study examines how sleep deprivation affects reaction times. The sample data indicate slower reaction times after a night of sleep deprivation. Inferential statistics, such as a t-test, allow the researcher to quantify the uncertainty around whether this difference in reaction times would be observed in the general population, or if it is specific to the sample. The analysis might suggest a significant effect with some degree of uncertainty, allowing cautious conclusions about the broader population.

These examples show how inferential methods help quantify uncertainty when drawing conclusions about behavior from sample data, guiding more accurate generalizations.

Activity 63

Create a t-chart showing the key differences between descriptive statistics and inferential statistics.

Correlation coefficients

Correlation coefficients are statistical *measures* that quantify the direction and strength of the relationship between two variables. In psychology research, they examine to what extent different psychological variables such as behaviors, traits, attitudes or stimuli relate to each other.

The most common correlation coefficient used in psychology is the Pearson correlation coefficient (denoted as r), which measures the degree of linear relationship between two variables on a scale from -1 to $+1$.

- A coefficient of $+1$ indicates a perfect positive linear relationship: as one variable increases, the other variable increases at a constant rate.
- A coefficient of -1 indicates a perfect negative linear relationship: as one variable increases, the other decreases at a constant rate.
- A coefficient of 0 suggests no linear relationship between the variables.

For example, if we measured the amount of time spent studying and exam scores, a Pearson correlation of $+1$ would mean that for every additional hour of study, there is a proportional increase in exam scores across all participants. This would suggest a perfectly consistent, direct relationship between studying and performance, with no variation.

In contrast, a coefficient of -1 would indicate a perfect negative linear relationship: as one variable increases, the other variable decreases at a constant rate. For example, a correlation of -1 between stress levels and hours of sleep would indicate that, as stress increases, the amount of sleep decreases proportionally and predictably.

A correlation coefficient of 0 suggests no linear relationship between the two variables. For instance, there might be no correlation between the number of hours someone plays video games and their academic performance, meaning changes in one variable do not predict changes in the other.

However, correlation does not imply causation. Two variables might correlate without one directly causing the other to *change*; they might be influenced by a third variable, or the relationship may be coincidental.

In psychology, correlation coefficients are used for a variety of purposes.

- **Exploring relationships:** Researchers use them to explore potential relationships between psychological variables, which can generate hypotheses for further study.
- **Predicting outcomes:** Correlations can help predict the value of one variable based on the known value of another, which is useful in clinical settings or in understanding behavioral outcomes.
- **Validity and reliability testing:** They are used in psychometrics to assess the validity and reliability of psychological tests and measures – for example, comparing test scores over time by administering the same test to the same group of individuals at two different points in time and correlating the scores.

Thematic analysis

Thematic analysis is a qualitative research method used in psychology to identify, analyze and report patterns (themes) within data. It provides a flexible and accessible tool for researchers to make sense of complex datasets, often derived from interview transcripts, observation notes or other textual sources. The process involves the detailed and systematic examination of data to uncover underlying ideas, concepts and patterns that recur across a dataset.

The stages of thematic analysis facilitate a structured approach to data analysis, allowing researchers to move from raw data to a set of themes that capture the essence of the data collected. These stages include:

- **Familiarization with the data:** This involves reading and re-reading the data to become intimately familiar with its content. Notes and initial ideas are made during this phase.
- **Generating initial codes:** Coding involves systematically working through the data and identifying significant or interesting features, which are annotated with a short, descriptive labels or codes. This process helps to start organizing the data into meaningful groups.
- **Searching for themes:** Codes are grouped into potential themes that capture something important about the data in relation to the research question. This stage is about identifying broader patterns of meaning that several codes may suggest.
- **Reviewing themes:** The identified themes are reviewed and refined to ensure they work in relation to the coded extracts and the entire dataset. This may involve splitting, combining or discarding initial themes.
- **Defining and naming themes:** Each theme is clearly defined and named, capturing the essence of what each theme is about and how it contributes to the overall narrative of the research.
- **Producing the report:** The final stage involves weaving together the analytic narrative and data extracts to tell the story of the data in a way that addresses the research question. This includes a detailed analysis of each theme, supported by data extracts, and a discussion of how the themes fit together.

Thematic analysis is widely used in psychology to explore participants' experiences and perceptions and the meanings they ascribe to them. It allows researchers to delve into complex datasets and extract significant patterns of behavior or thought, providing deep insights into the psychological aspects under investigation. The themes that emerge from this analysis offer a nuanced understanding of the studied phenomenon, contributing to the broader field of psychological research.

TOK

TOK considers how competing perspectives may give different explanations of a phenomenon. Therefore, how can we decide which explanation to accept? On what basis may one perspective be considered more valid than another?

TOK

In psychology, humans are usually researching other humans. This raises questions about whether it is possible to eliminate the effect of the observer in the pursuit of knowledge in the human sciences and whether it is desirable to do so.

Activity 64

Choose an interview with or an article by a psychology researcher about one of these topics:

- teenagers and sleep
- screen time and young children
- attention and video games.

Using thematic analysis, follow these steps.

1. **Familiarization:** Read through the interview transcript carefully and take notes on any interesting points or ideas.
2. **Generate initial codes:** Identify and label significant or recurring features in the interview with short, descriptive codes.
3. **Search for themes:** Group related codes into broader themes that capture key ideas from the interview.
4. **Review and define themes:** Refine the themes to ensure they accurately represent the data, then name each theme clearly.

After completing these steps, write a brief summary of the main themes you identified in the interview/article and explain how they reflect the researcher's views.

Activity 65

In groups, research one of the following:

- Buss (1989) cross-cultural differences in attraction (survey/questionnaire)
- Toro-Morn and Sprecher (2003), who conducted a cross-cultural comparison of mate preferences among university students in the USA and China using interviews alongside surveys. This allowed the researchers to explore nuanced cultural differences and gender expectations in mate selection beyond the standardized questionnaires.

Compare and contrast the types of insights that were generated. Think about how different research strategies can draw out more nuanced perspectives. For example, did the researchers reveal deeper cultural dynamics and the personal significance of these traits, which may not be fully conveyed in surveys that focus on ranking or rating predefined characteristics?

Research considerations

Reliability

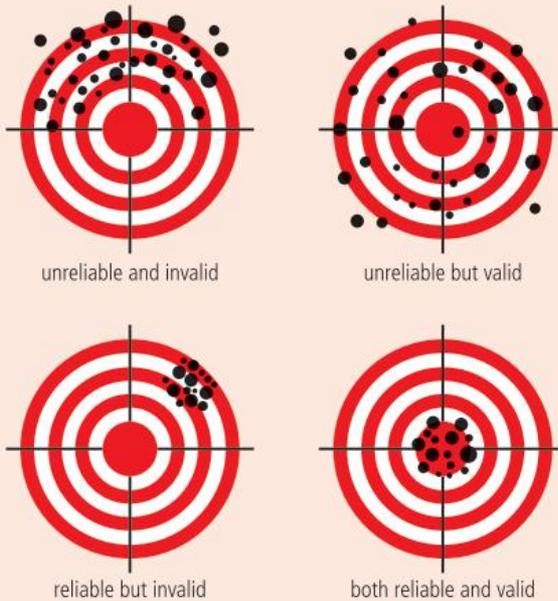
Reliability in psychological research refers to the consistency or dependability of *measurement*. Essentially, reliability is about whether a research method, tool or test produces stable and consistent results over time. When a psychological test or research instrument is reliable, it means that it can be used repeatedly, under similar conditions, and produce similar results.

Validity

Validity in psychological research refers to the extent to which a research method, tool or test *measures* what it is intended to measure. Validity is about the accuracy and appropriateness of conclusions drawn from the research. Validity is a multifaceted concept, and several types are particularly important in psychology.

Activity 66

Look at these targets and then discuss them in a group or with the class. Can you agree why some patterns of impact points have validity and some have reliability?



Internal validity refers to the degree to which the observed effects in a study are due to the manipulation of the independent variable and not to other factors. It assesses the *causal* relationship between variables within the study. High internal validity means that the study is well-designed and controlled, minimizing the influence of extraneous variables or confounding factors that could affect the outcome. Methods to enhance internal validity include controlling variables, using random assignment and ensuring a clear operational definition of variables.

External validity relates to the extent to which the findings of a study can be generalized or applied to contexts outside the study's setting, such as to other populations, settings or times. External validity addresses the applicability and relevance of the research findings beyond the specific conditions under which the study was conducted. Strategies to improve external validity include using random sampling, ensuring the research setting and procedures are similar to real-world conditions, and replicating the study with different groups.

Content validity *measures* whether a test or instrument comprehensively covers the construct it intends to measure. It examines if all aspects of the construct are represented adequately by the items in the test. An example of content validity might be a psychology exam that aims to measure understanding of cognitive development: it should include questions that cover all key theories and concepts within that

domain. Ensuring content validity often involves expert reviews to confirm that the test items fully represent the intended construct.

Face validity is the most basic form of validity. It refers to the extent to which a test appears to *measure* what it is supposed to measure, at face value, to lay people (non-specialists) or the participants themselves. Although face validity does not ensure that the test actually measures the intended construct accurately, high face validity can increase the acceptance and cooperation of participants. Face validity is assessed through subjective judgment and is not a rigorous measure of validity.

Construct validity is the overarching assessment of how well a test or tool *measures* the construct it claims to measure. It integrates various forms of validity, including content and face validity, to evaluate whether the instrument accurately reflects the theoretical construct. Construct validity is established through a series of research studies that demonstrate the test's relationship to other measures and behaviors it should theoretically be related to. For example, a test measuring anxiety should correlate with established measures of anxiety and predict related behaviors, such as avoidance.

Generalizability

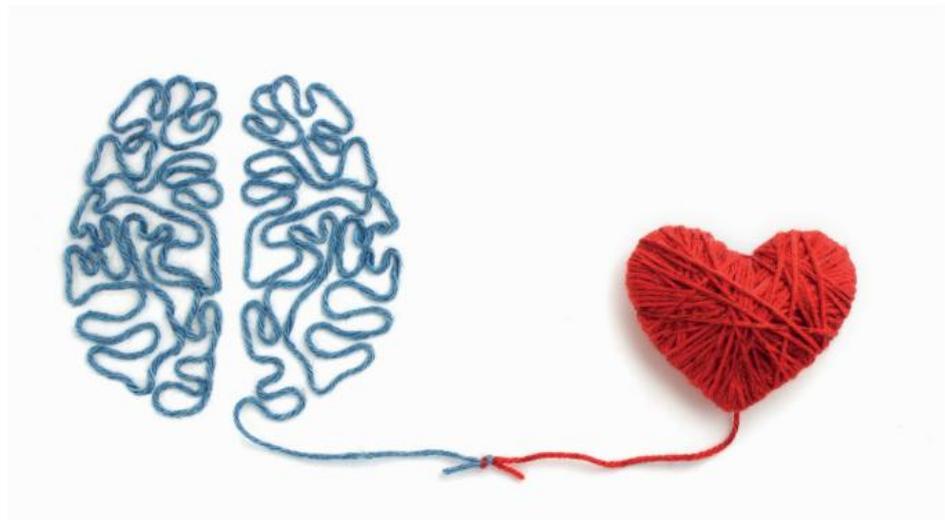
Generalizability, often associated with quantitative research, refers to the extent to which the results of a study can be extended or applied to the broader population beyond the sample studied. Generalizability reflects the universal applicability of the research conclusions and is essential for the progression of psychological theories and practices. High generalizability ensures that the insights gained from a specific study have relevance and utility across various contexts, thereby enhancing the value and impact of the research.

Researcher bias

Researcher *bias* can manifest in several ways, such as in the formulation of the research question, the selection of participants, the interpretation of results, and even in the recording of observations. Researcher bias occurs when the preconceptions or subjective beliefs of the researcher inadvertently influence the study's design, data collection, analysis or interpretation.

Researcher bias can manifest in several ways, such as in the formulation of the research question, the selection of participants, the interpretation of results, or even in the recording of observations. However, this does not necessarily mean it should be considered in a negative light. It raises questions regarding to what extent it might be legitimate for a researcher to draw on their own experiences as evidence in their investigations in the human sciences.

TOK



The following are some strategies used to minimize researcher bias.

- **Use of reflexivity:** This encourages researchers to reflect on their own beliefs, judgments and practices throughout the research process and consider how these may influence the study. Keeping a research journal can be a useful way to practice reflexivity. For example, Barry and O’Callaghan (2009) used reflexive journals in the context of music therapy. These journals were used to document personal observations about participants and refine understanding through daily reflections, which enriched the context for more formal data collection methods such as interviews.
- **Inter-rater reliability:** This involves using more than one researcher to analyze the findings from a study. If the analyses by different researchers correlate strongly, it indicates that the findings are not unduly influenced by the subjective biases of any single researcher. For example, Ventura et al. (1993) studied inter-rater reliability in diagnosing schizophrenia using structured clinical interviews. The use of multiple clinicians, and the high correlation of their diagnoses, helped to demonstrate that the diagnostic criteria were applied consistently and were not subject to the individual biases of a single clinician.
- **Double-blind design:** Neither the participants nor the researchers (nor the assistants collecting data) know who is in the control or experimental groups. Double-blind design can help prevent the researchers’ expectations from influencing the results. For example, in Kirsch and Sapirstein’s (1998) meta-analysis of antidepressant effectiveness, a double-blind design was employed to ensure that neither the patients nor the clinicians knew who was receiving the active drug versus the placebo. This helped control for the placebo effect and clinician bias, leading to more accurate evaluations of the drug’s efficacy.
- **The use of a “decision trail”:** The researcher explains the thinking behind their interpretation of the data. This helps the reader to understand where, why and how the researcher conducted the research in the way they did. This can be achieved by publishing excerpts from a researcher’s diary.
- **The inclusion of quotes from qualitative interviews:** A researcher’s claim in their final report is supported by excerpts from the transcription.
- **The use of member checking:** The data, interpretations and conclusions are shared with the participants. It allows participants to clarify what their intentions were, correct errors and provide additional information if necessary.

Activity 67 (CAS)

Think about what you wore last Saturday. Write a decision trail to explain your choices.

Participant bias

Participant bias refers to the influence of participants’ preconceptions, expectations or behaviors on the study’s findings. This type of bias can occur when participants act in ways they believe are expected of them, or when they respond to perceived cues from the researcher.

The following are some strategies used to minimize participant bias.

- **Participants being unaware of whether they are in the experimental or control group.** This can help reduce behavior influenced by their expectations regarding

the study's purpose. This is known as a single-blind technique. For example, Loftus and Palmer's (1974) study on eyewitness testimony revealed how subtle changes in wording could influence memory recall. Participants were unaware of the manipulation in the wording of questions, and therefore could not give answers based on what they thought was expected of them.

- Participants may respond in ways they believe are socially acceptable or favorable, rather than answering truthfully. This is known as **social-desirability bias** (SDB). Ensuring anonymity and confidentiality can help mitigate this bias, as participants may feel more comfortable being honest if they believe their responses cannot be traced back to them. For example, in a study examining alcohol consumption, participants might underreport their drinking habits to appear more responsible or to align with perceived norms. By using anonymous surveys or assuring participants that their responses will remain confidential, researchers like Fisher and Katz (2000) have found that individuals are more likely to report their behaviors accurately.
- Providing participants with statements that other “participants” have made regarding the topic, and then asking them to choose one that they identify with the most. This reinforces the fact that there is no “acceptable” or “unacceptable” response.
- The use of proxy participants, whereby acquaintances and close friends of the participants, as well as the participants themselves, are interviewed. This allows an insight into the participant's true opinions or behaviors. If researchers interview both participants and their proxies and the results do not correlate, researchers can assume that the participants have shown some form of SDB.

Reflexivity

Reflexivity involves a deliberate process of self-examination by researchers, where they critically reflect on their own backgrounds, beliefs and assumptions and consider how these might influence their research, from the formulation of research questions to the collection, analysis and interpretation of data. Reflexivity is generally only applicable to qualitative research but can be used to a lesser extent in quantitative research.

The following are some reflexivity practices to check for unconscious *bias*.

- Keeping a research journal: A practical step for implementing reflexivity is for researchers to maintain a detailed journal throughout the research process. This journal can include reflections on decisions made at various stages of the research, personal reactions to the data or research findings, and any recognized biases or assumptions that might influence the research. By documenting these reflections, researchers can identify and address potential unconscious biases that may affect their study.
- Engaging in critical discussions: Reflexivity can also involve discussions with colleagues or mentors about the research process. These discussions can provide external *perspectives* that help researchers identify unconscious biases they might not have recognized on their own. Engaging in such dialogues can be a valuable way to challenge and refine one's thinking.
- Training and education: Researchers can benefit from training sessions or workshops focused on identifying and mitigating unconscious bias. These

educational opportunities can enhance researchers' ability to recognize their own biases and understand how these biases could potentially influence various aspects of their research.

- **Interdisciplinary collaboration:** Collaboration with researchers from different disciplines can bring diverse *perspectives* to a study, potentially uncovering unconscious biases rooted in disciplinary norms or methodologies. Interdisciplinary collaborations can provide fresh insights and challenge entrenched ways of thinking, thereby mitigating the impact of unconscious biases.
- **Member checking:** Involving participants in the review of findings or interpretations (a process known as member checking) can also serve as a reflexivity practice. This process allows researchers to check their interpretations against participants' *perspectives*, reducing the influence of the researcher's unconscious biases on the study's conclusions.

Transferability

Transferability, often associated with qualitative research, refers to the extent to which the findings of a study can be applied to other contexts or groups with similar characteristics.

Transferability emphasizes the depth and richness of data collected from a smaller, more focused sample. It relies on the readers' or external researchers' judgment to determine how applicable the findings are to another context, rather than on statistical generalization. Detailed descriptions of the research context, participants and methods enable others to assess the relevance of the findings to new settings.

When thinking about transferring the findings to another population or context, several key factors can be considered.

- **Sample characteristics:** The characteristics of the participants (age, gender, cultural background, socioeconomic status, etc.) play a role in generalizability/transferability because when a study's participants have specific traits, the findings may not be applicable to individuals with different characteristics. Therefore, researchers must consider whether their sample adequately represents the broader population to which they wish to transfer their findings.
- **Setting of the study:** The setting in which the research is conducted can influence the outcomes. Studies carried out in highly controlled laboratory settings may yield different results than those conducted in naturalistic environments, due to the artificial nature of laboratory settings. Therefore, the setting's similarity to real-world contexts should be considered when transferring findings.
- **Time of research:** The temporal context of the study can also affect transferability. Societal norms, technological advancements and historical events can influence behavior and psychological processes. Researchers should consider whether the timing of their study might limit the applicability of their findings to other periods.
- **Measurement tools:** The instruments used to *measure* psychological constructs must be relevant and valid across different groups and settings. For instance, a questionnaire developed and validated in one cultural context may not be appropriate for use in another culture without adaptation and revalidation.

TOK

There are lots of techniques in the human sciences that ask researchers to consider their own influence on the research process. How certain can we be that the knowledge produced in the human sciences is accurate?

- **Statistical considerations:** The statistical power of a study and the effect sizes observed can influence generalizability. Studies with small sample sizes, or those that barely achieve statistical significance, may not produce findings that are robust enough to apply to broader populations. This is not usually the case with transferability, as it relates to qualitative research, which does not often use statistical *measures* to create conclusions.
- **Ethical considerations:** When transferring findings, ethical considerations must be taken into account, particularly concerning the potential for harm or the possibility of misinterpreting the findings in different contexts. The benefits of applying the research findings to a broader context must outweigh any potential risks.
- **Environmental and cultural context:** The initial research environment, including its cultural and societal nuances and the specific conditions under which the study was conducted, needs thorough scrutiny. The degree to which findings are relevant to another setting hinges on the congruence or variance of these environmental and cultural factors.
- **Theoretical alignment:** Ensuring that the theoretical foundations or conceptual underpinnings of the original study align with the new context is imperative. This alignment guarantees that the core principles guiding the findings are relevant across different settings.

TOK

What forms of protection against research error and bias are available to human scientists? Are there some research methods used by researchers that create more bias than others? If so, how can we be certain that bias is being created?

Credibility

Credibility refers to the trustworthiness and believability of a study's findings. Ensuring the credibility of research is paramount in psychology, where the interpretation of data and the application of findings can have profound implications, such as the implementation of a new government policy or a new treatment for a particular disorder. Credibility is built on the foundation of rigorous methodology, transparent reporting and the deliberate avoidance of *biases* that can distort research outcomes.

There are several strategies for ensuring the credibility of research.

- **Transparent methodology:** Researchers should provide clear descriptions of their research design, participant selection, data collection methods and analysis procedures. This transparency allows other researchers to understand the process, replicate the study if desired and assess the findings' reliability. Detailed methodology also aids in identifying potential biases or limitations within the study itself.
- **Triangulation:** Methodological triangulation, involving multiple data collection methods or analytical approaches, enhances credibility by providing converging evidence for a study's findings. Data triangulation gathers insights from various sources, times or groups, enriching the research context. Researcher triangulation includes multiple researchers to mitigate individual biases, offering a broader perspective on data interpretation. Finally, theoretical triangulation applies different theories or frameworks for a comprehensive analysis, allowing for diverse interpretations of the data. Each type of triangulation contributes to a more robust, valid and nuanced understanding of the research topic, strengthening the overall findings by demonstrating consistency and reducing the potential for bias across different contexts and approaches.



Triangulation in research refers to the technique of using multiple methods, data sources, *perspectives* or theories to investigate a phenomenon. By integrating different angles and approaches, researchers can overcome the limitations or *biases* inherent in any single source or method, leading to a more comprehensive and robust understanding of the research question.

- **Peer review and feedback:** Seeking feedback from peers, including those from different disciplines or with differing viewpoints, can significantly enhance the credibility of psychological research (Figure 2.25). Peer review can uncover potential flaws or biases in the research design or interpretation of data that the original researchers might have overlooked.



Figure 2.25 Constructive criticism and suggestions for improvement contribute to the refinement and robustness of research findings.

- **Member checking:** Involving participants in the validation of findings or interpretations, a process known as member checking, can also enhance credibility. Allowing participants to review and comment on the researchers' interpretations ensures that the conclusions drawn are representative of the participants' experiences and perspectives, thereby enhancing the findings' authenticity and credibility.

Activity 68

Triangulation is important in all walks of life when we are making decisions. Think about the last big decision you made – what subjects to take in the IB, what to do during the school break, where to get a part-time job, whether to join a sports team, etc. Did you seek multiple sources of evidence to triangulate to make that decision? How did you weigh information from one source compared to another?

How can we be certain that the research methods used in psychology are producing accurate knowledge?

TOK

Research methods

Experiments

True experiments

A **true experiment** is when the researcher directly manipulates the independent variable (IV) and *measures* the effect on the dependent variable (DV) while controlling for extraneous variables. The IV and DV need to be operationalized. The purpose is to draw a *causal* relationship between the IV and the DV.

True experiments are appropriate for investigating questions relating to cause-and-effect relationships, the impact of specific variables on behavior, cognitive processes, emotional responses and social interactions – any area that allows the researcher to identify, isolate, manipulate, control and measure singular variables.

However, they may not be appropriate for investigating questions relating to complex, multifaceted phenomena that cannot be easily manipulated or controlled in a laboratory setting; ethical considerations that prevent the manipulation of variables; and deeply personal or cultural experiences that require a more nuanced, qualitative approach.

The advantage of using a true experiment is that the researcher has high levels of control over extraneous variables. This means that all conditions can be identical, apart from the IV. There is usually a control group where there is no manipulation of the IV and the DV is measured; this allows a baseline measurement for comparison. Therefore, there can be more certainty regarding cause-and-effect because there is more control over external variables. Another advantage is that true experiments can usually be easily replicated by other researchers (to test for reliability) because a standardized procedure is used.

The disadvantage of using a true experiment is that it may lack ecological validity by not accurately representing real-world settings. It can be difficult to control for all extraneous variables, potentially confounding the results. Also, it may not capture the complexity of human behavior and mental processes, which are influenced by a myriad of factors that cannot be easily isolated in experimental conditions.



Conceptual question

True experiments aim to establish cause-and-effect relationships between variables, but how can we be certain that a particular variable is truly the *cause* of an observed behavior, and not influenced by external factors?

Finally, ethical constraints may limit the manipulation of variables when using a true experiment to investigate psychological phenomena. For example, inducing extreme stress, anxiety or other negative emotional states to examine their effects on behavior or decision-making would be unethical. Similarly, experiments involving deception must be carefully designed to ensure that participants are not harmed or misled in a way that could cause lasting damage or distress.

Quasi-experiments

Quasi-experiments can be defined as a research method where participants are grouped or compared based on a characteristic of interest, such as gender or ethnicity, or scores on a psychological *measurement* scale.

In quasi-experiments, the experimenter studies the difference between conditions of the IV and measures the DV, operationalizing both. Participants are not randomly allocated to the different conditions of the IV; instead, the IV relates to pre-existing characteristics of interest to the researcher and are not directly manipulated by the researcher. The aim is to control extraneous variables as much as possible, making the IV the only difference between the two conditions.

However, this can be challenging when the IV is pre-existing. Quasi-experiments are suitable for examining the effects of variables that cannot be randomly assigned to participants, such as investigating the impact of socio-demographic variables on behavior, cognitive processes, emotional responses and sociocultural interactions. They allow for the tentative study of cause-and-effect relationships in settings where controlled manipulations of the IV are not feasible due to ethical or practical limitations. However, more caution should be used in questions relating to cause-and-effect than in a true experiment because of the relative lack of control over the IV.



Conceptual question

Quasi-experiments often involve variables that cannot be manipulated. How can we determine whether *changes* in behavior are due to natural maturation or the result of a specific intervention?

Therefore, quasi-experiments may not be appropriate for studying phenomena that require a high degree of control over all variables, as the lack of random assignment to conditions can introduce confounding variables that may affect the outcome. They are also less suited for research questions that demand a thorough manipulation of variables in a highly controlled setting.

Mueller and Oppenheimer (2014) is an example of a quasi-experiment where the variable was the type of note-taking done during a university lecture (by hand versus typed).

Activity 69

Before learning about the findings of Mueller and Oppenheimer (2014), what is your hypothesis? Do you think participants will remember more from the lecture if they take notes by hand or by computer?

The advantages of quasi-experiments include the ability to study variables in a more naturalistic setting, which can increase ecological validity. They also allow for the examination of tentative cause-and-effect relationships when ethical or practical considerations prevent the random assignment of participants to conditions.

The disadvantages include potential challenges in controlling for all extraneous variables, which can confound the results. The lack of random assignment means that any differences between groups could be due to pre-existing differences

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The advantages and disadvantages of various research methods raise questions regarding which methods are most suitable for studying the different types of human behavior. For example, to what extent are the methods used to gain knowledge in the human sciences “scientific”? Do true experiments allow researchers to establish causality when investigating behavior?



You can read more about this study on page 315.

rather than the IV, thereby complicating the causal interpretation of the findings. Additionally, quasi-experiments may not fully capture the complexity of human behavior and mental processes, as these are influenced by a multitude of factors that cannot be easily isolated.

Finally, ethical constraints may limit the use of a quasi-experiment to investigate psychological phenomena. For instance, researching the effects of natural disasters, trauma or long-term illness on psychological well-being could raise ethical concerns about exacerbating participants' distress or exploiting vulnerable populations for research purposes. Furthermore, because participants cannot be randomly assigned to conditions in a quasi-experiment, there may be ethical dilemmas related to fairness and the potential psychological impact of being categorized based on sensitive or stigmatizing pre-existing characteristics. Ethical considerations must therefore be considered, with particular attention paid to informed consent, confidentiality and the right to withdraw. Researchers must ensure that participants are not harmed by their inclusion in the study and that the benefits of the research justify any potential risks or discomforts. This careful balancing act between scientific inquiry and ethical *responsibility* is important in conducting quasi-experiments that respect the dignity and rights of all participants.

Observations

Naturalistic observations

In **naturalistic observations**, data is collected as it occurs in the participant's natural environment without any manipulation by the observer (Figure 2.26). During naturalistic observations, researchers take great care to use unobtrusive methods, to avoid interfering with the behavior they are observing. The aim is to gather data in a setting that has not been altered in any way by the researcher, thus maintaining the natural behaviors of the subjects under study. This method allows researchers to observe behaviors and situations as they happen in real-life settings, providing insights into processes in their natural context.

Figure 2.26 Naturalistic observations are particularly suitable for studying phenomena that cannot be ethically or practically manipulated in a laboratory setting, such as children's play behavior at home or in a playground, consumer shopping patterns or social interactions in public places.



Ethical constraints may hinder psychology researchers in researching areas they are interested in. To what extent are the methods used in the human sciences limited by the ethical considerations involved in studying human beings?

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For example, James et al. (2022) conducted a naturalistic observation study on children's use of inclusive playgrounds. This study aimed to observe play behaviors, such as climbing, running and social interactions, between children of varying abilities in an outdoor setting. The research found that inclusive playgrounds promoted active and functional play among children, providing a valuable insight into how children interact in real-world play environments.

However, naturalistic observations may not be appropriate for research questions that require precise control over variables to establish cause-and-effect relationships. The inability to manipulate the environment or the subjects' behaviors can limit the researcher's capacity to draw causal inferences. Additionally, natural settings have many uncontrollable factors that could influence the behavior being studied, making it difficult to isolate the effects of specific variables.

The advantages of using naturalistic observations include the high ecological validity of the data, as behaviors are observed in their natural context. This method also allows researchers to study phenomena that are difficult or impossible to replicate in a laboratory setting. Furthermore, it can provide a rich source of hypotheses for future experimental research.

The disadvantages include the potential for observer *bias*, where the researcher's expectations and *perspectives* may influence their interpretation of the behaviors observed. Additionally, the lack of control over extraneous variables means that it is difficult to establish causal relationships. There is also the challenge of ensuring the representativeness of the observations, as what is observed may not be typical of the broader context or population.

Finally, ethical considerations play a significant role in naturalistic observations, especially regarding privacy, consent and the potential impact on the subjects being observed. For example, observing individuals in private or sensitive contexts without their knowledge could invade their privacy. Researchers must navigate these challenges carefully, often by ensuring that observations are made in public settings where individuals would reasonably expect to be observed by others. Ethical guidelines require that researchers minimize harm and protect the dignity and confidentiality of those observed. In situations where obtaining informed consent is not feasible, researchers must carefully consider the ethical implications of their observational methods and strive to balance the scientific value of the research with the rights and well-being of individuals.

Controlled observations

In **controlled observations**, the observer systematically watches and records behavior within a structured environment. Unlike naturalistic observations, controlled observations involve the deliberate manipulation or control of the environment, and possibly the subjects, to observe how these manipulations influence behavior. The manipulation or control of some variables by the researcher enhances their ability to examine the effects of specific variables on behavior. The aim is to observe behaviors in a semi-natural setting while still maintaining a degree of control over the conditions under which those behaviors occur.

Controlled observations are suitable for studying behaviors that can be elicited in a controlled environment, allowing researchers to focus on specific variables of interest.

This method is particularly useful in situations where a high degree of control is needed to isolate the effects of particular variables on behavior, but where full experimental manipulation is not possible or ethical. Controlled observations are often employed in psychological research to study social interactions, learning behaviors in children or consumer behavior in simulated environments. For example, Fagerstrøm et al. (2009) conducted a controlled observation involving simulated environments where participants' choices and behaviors were observed in response to various product presentations, allowing for the analysis of consumer decision-making under controlled conditions.

However, this method may not be appropriate for studying complex, multifaceted phenomena that cannot be easily replicated or controlled in a semi-natural setting. The artificiality of the controlled environment may also affect the authenticity of the behaviors observed, potentially reducing the ecological validity of the findings. Furthermore, the presence of observers and the awareness of being observed might influence participants' behavior, a phenomenon known as the Hawthorne effect.

The advantages of using controlled observations include the ability to study the effects of specific variables on behavior within a structured environment, allowing for a clearer interpretation of the relationships between variables. This method can bridge the gap between the high control of laboratory experiments and the high ecological validity of naturalistic observations, offering a balanced approach to studying behavior.

The disadvantages include potential observer *bias*, where the researcher's expectations can influence the interpretation of observed behaviors. There is also the challenge of maintaining the naturalness of the behavior while controlling the environment, which can sometimes lead to artificial behaviors that do not accurately represent real-life situations. Moreover, controlling the observation setting may limit the generalizability of the findings to more natural environments.

Finally, there are ethical considerations in controlled observations regarding consent, privacy and the potential for psychological harm. For example, subjects must be informed about the nature of the observation and their rights as participants, including their right to withdraw. Ethical guidelines dictate that the benefits of the research must outweigh any potential risks or discomfort to the participants. Researchers must ensure that the controlled setting does not create undue stress or anxiety for participants and that confidentiality and privacy are maintained. Balancing the need for control with the ethical treatment of participants is important, requiring careful planning and sensitivity to the rights and well-being of individuals involved in the research.

Overt observations

In **overt observations**, the observer's presence and purpose are known to the participants. Transparency allows subjects to be aware that they are being observed, which can influence how they behave in both positive and negative ways. The aim is to observe behavior in natural settings or situations where the observer's presence is openly acknowledged, facilitating the collection of data on how individuals or groups act in specific contexts when they know they are being studied.

Overt observations are particularly suitable for studying social interactions, organizational behavior or educational settings where ethical considerations require that participants be informed about the research (Figure 2.27).



Figure 2.27 Overt observation allows researchers to engage directly with the environment, which can provide deeper insights into the phenomena being studied.

However, this method may not be appropriate for situations where the knowledge of being observed could significantly alter the behavior being studied, making it difficult to assess genuine responses or actions. The Hawthorne effect is therefore a notable concern for this method.

The advantages of using overt observations include the ethical transparency of the research process, as participants are aware of and can consent to being observed. This method can also facilitate interactions between the observer and participants, allowing for richer, more nuanced data collection and the opportunity to follow up on interesting or unexpected observed behaviors.

The disadvantages include the potential for participant reactivity, where individuals alter their behavior because they know they are being watched, which can skew the results. There is also the challenge of obtaining naturalistic data, as the observer's presence might influence the situation. Additionally, overt observations require careful consideration of how the observer's role is introduced and managed within the study context to minimize its impact on participant behavior.

Finally, ethical considerations focus on informed consent, the right to privacy and the potential impact of observation on participants. For example, while participants may agree to be observed, researchers must ensure that this consent is fully informed and that participants understand their rights, including the right to withdraw at any time. Ethical challenges may arise in ensuring that participants do not feel coerced or

uncomfortable with the observation. Researchers must navigate these issues carefully, striving to maintain the integrity of the data while respecting the autonomy and dignity of all participants. Balancing the benefits of overt observations with the ethical treatment of participants is essential, requiring a thoughtful and sensitive approach to research design and implementation.

Covert observations

In covert observations, the observer's presence and purpose are concealed from the participants (Figure 2.28). Covert observations involve observing behaviors and interactions without the subjects' knowledge, aiming to capture genuine behaviors in natural settings. The primary goal is to study how individuals or groups act in their natural environment without the influence of the observer's presence, which could alter the behavior being studied. Covert observations are used to investigate behaviors that might be altered by awareness of observation, such as social interactions, consumer behavior and compliance with social norms.

Covert observations are especially suitable for exploring natural behaviors in situations where the presence of an observer might lead to significant *changes* in how people act. This method allows researchers to gather data on spontaneous behaviors and interactions in their authentic contexts.

However, this method may not be appropriate for all research contexts, especially where ethical considerations about privacy, consent and deception are paramount. Lack of informed consent and potential invasion of privacy pose significant ethical challenges. Additionally, the feasibility of covert observation is limited by the need to observe without being detected, which can constrain the range of behaviors and settings that can be effectively studied.

The advantages of using covert observations include the ability to observe genuine, unaltered behavior, providing insights into how people naturally interact in their environments. This method can reveal aspects of social life that might be hidden from or altered by an overt observer, offering valuable data for understanding complex social phenomena.

The disadvantages include significant ethical concerns related to observing individuals without their knowledge or consent. The potential for invasion of privacy and the ethical dilemma of deceiving participants by hiding the observer's presence are critical considerations. Researchers must navigate these ethical challenges by considering the minimum level of intrusion necessary to achieve the research objectives and ensuring that the research design includes measures to protect individuals' rights and dignity. Research Ethics Committees often require a thorough justification of covert methods, weighing the scientific and societal benefits of the research against the ethical costs of not informing participants about the observation.

Participant observations

In **participant observations**, the observer becomes an active participant in the environment or group being studied. Immersion into the setting allows the researcher to collect data from an insider's *perspective*, aiming to understand the social dynamics, behaviors and cultural practices of the group from within. By engaging directly with the participants and their activities, the researcher can gain a deeper insight into the



Figure 2.28 Cameras can be used to carry out covert observations.

Research Ethics Committees will be influenced by the political and cultural norms of the places they work in. To what extent is it legitimate for political and cultural figures to impose constraints on psychology research? What are the implications for the search for truth?

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context and meaning of behaviors, interactions and social processes. Participant observation is used to explore complex social settings, communities and cultures that are otherwise difficult to study from an external viewpoint.

Participant observations are particularly suitable for in-depth studies of social groups, communities or cultures where understanding the nuances of social interaction, norms and practices is essential. This method is valuable in ethnographic research, where the goal is to comprehensively understand the way of life of a group of people by observing and participating in their daily activities. It is also used in organizational studies, educational research and any context where the richness of the social setting plays an important role in the phenomena being studied.

However, this method may not be appropriate for research questions requiring objective *measurements* of behavior or where the presence and participation of the researcher could significantly alter the natural dynamics of the group or setting. The intense involvement of the researcher with the participants also raises ethical considerations regarding informed consent, confidentiality and the potential impact of the researcher's presence on the group being studied.

The advantages of using participant observations include the ability to gather rich, in-depth data that offers comprehensive insights into the social fabric of the group or setting. This method allows for a nuanced understanding of complex social phenomena, practices and interactions from the *perspective* of the participants themselves. It also facilitates the identification of tacit norms and unspoken rules that govern behavior within the group.

The disadvantages include potential observer *bias*, as the researcher's close involvement with the participants might influence their objectivity and the interpretation of data. There is also the challenge of maintaining a balance between participation and observation to ensure that the researcher's presence does not unduly influence the group's dynamics. Additionally, the method requires a significant investment of time and effort to build trust with participants and achieve a deep understanding of the setting.

Finally, ethical considerations are important in participant observations. They focus on navigating the dual roles of observer and participant while maintaining transparency, respecting privacy and ensuring informed consent. For example, researchers must be transparent about their research objectives while being sensitive to the impact of their involvement on the group's dynamics. They need to negotiate consent in situations where their dual role could influence participants' willingness to share information. Confidentiality and the protection of sensitive information become important when researchers are privy to intimate details of participants' lives. Balancing the ethical obligations to the participants with the research goals requires careful ethical deliberation and ongoing reflexivity throughout the research process.

Non-participant observations

In **non-participant observations**, the observer does not become actively involved in the environment or group being studied but instead observes the behaviors and interactions from a distance. This method aims to maintain objectivity by minimizing the observer's influence on the setting or participants.

Non-participant observations are particularly suitable for studying behaviors and interactions in their natural settings without the alterations that might occur due to the presence of an active participant researcher. This method is valuable in situations where the researcher's goal is to collect data on the authentic dynamics of a situation, such as classroom behaviors, public interactions or the functioning of an organizational process. It is also appropriate when ethical or practical considerations prevent the researcher from becoming directly involved in the setting.

However, this method may not be appropriate for research that requires a deep understanding of the internal *perspectives* and experiences of the participants, as the observer remains outside the social group or situation being studied. The lack of direct involvement can limit the researcher's ability to grasp the nuanced meanings behind observed behaviors and interactions.

The advantages of using non-participant observations include the ability to observe and collect data on behavior as it naturally occurs, without the potential alterations caused by the researcher's active participation. This can enhance the objectivity and validity of the observations. Additionally, this method allows researchers to study a wide range of settings and behaviors, providing a broad view of the phenomena of interest.

The disadvantages include potential limitations in understanding the context and meaning of behaviors solely from an external viewpoint. The observer's lack of direct engagement with the participants may result in missed insights into the motivations, attitudes and perceptions underlying the observed behaviors. There is also the challenge of interpreting behaviors accurately without the benefit of insider knowledge or direct feedback from participants.

Finally, ethical considerations in non-participant observations focus on respect for privacy, informed consent and the potential impact of observing without participating. For example, even though the observer does not interact directly with the participants, it is important to consider the ethical implications of observing individuals without their explicit consent, particularly in private or semi-private contexts. Researchers must navigate the fine line between observing public behaviors and respecting individual privacy. Ensuring that research practices do not infringe the rights or well-being of the observed individuals is paramount. This may involve ethical review and adherence to guidelines that protect the interests of participants, even in settings where the observer's presence is minimized. Balancing the need for accurate data collection with ethical *responsibility* is a key consideration in the effective and respectful use of non-participant observation methods.

Activity 70 (CAS)

Create an observation method chart. First, define each observation method. Then, provide an example of when each type of observation might be used (for example, observing social interactions in a public park for naturalistic observations, observing consumer behavior in a simulated shopping environment for controlled observations). Finally, list at least two advantages and two disadvantages for each type of observation.

Surveys/questionnaires

Surveys/questionnaires can be defined as research methods that gather data by asking a group of people their thoughts, reactions or opinions relating to a set of predefined questions. This method is usually quantitative, involving tightly focused questions that can be answered on a scale or with yes/no responses. However, they can also be qualitative, with open-ended questions that allow for more detailed responses.

Surveys/questionnaires are particularly suitable for research aiming to collect data from a large number of individuals quickly and efficiently. They are valuable in studies seeking to understand trends, patterns or correlations within a population, such as consumer preferences, the prevalence of certain behaviors or the impact of societal issues. This method allows researchers to gather a broad spectrum of data across diverse groups, making it possible to generalize findings to a larger population.



Regan et al. (2012) used surveys to look at the behavior of marital satisfaction in arranged vs. love marriages in the Indian diaspora. They found there was no significant difference between the two groups in marital satisfaction, passionate or committed love. Surveys were an appropriate research methodology for this sensitive issue.

However, this method may not be appropriate for deeply exploring complex phenomena that require an understanding of the nuances of human experience, as it provides limited depth compared to more qualitative methods like interviews. The design of the questions can also significantly impact the quality of the data collected, with poorly worded questions leading to ambiguity and response *bias*.

The advantages of using surveys/questionnaires include the ability to collect data from a large sample size, making statistical analysis and generalization to the broader population more feasible. This method is also versatile, allowing data collection via various modes such as online, telephone, mail or in-person. Additionally, the standardized format facilitates the comparison and analysis of responses across participants.

The disadvantages include potential issues with response rates and the representativeness of the sample, which can affect the validity and reliability of the data. Respondents may also exhibit social-desirability *bias*, answering questions in a

manner they think is socially acceptable rather than reflecting their true thoughts or behaviors. Moreover, the lack of interaction with respondents limits the researcher's ability to probe deeper into the responses, potentially missing nuanced insights.

Finally, ethical considerations in surveys/questionnaires center on ensuring informed consent, maintaining respondent anonymity and confidentiality, and respecting the right to withdraw. For example, researchers must clearly communicate the purpose of the survey, how the data will be used and any potential risks or benefits to participants. Ethical concerns also extend to the design of the survey, avoiding questions that might invade privacy or cause distress. Ensuring that participation is voluntary and that respondents understand their rights is essential. Balancing the need for comprehensive data collection with the ethical treatment of participants underscores the importance of thoughtful survey design and implementation, adhering to ethical standards that protect the dignity and privacy of all respondents.

Interviews

Structured interviews

Structured interviews can be defined as a research method that involves asking all participants a standardized set of questions in a specific order, ensuring consistency across interviews. Structured interviews combine elements of both quantitative and qualitative research, allowing for the collection of comparable data across participants while also providing some depth of response.

Structured interviews are particularly suitable for research aiming to explore specific topics in depth while maintaining a consistent framework for comparison across participants. They are valuable in studies that require a mix of open-ended and closed questions to understand phenomena, allowing researchers to probe into the reasons behind certain behaviors or opinions within a controlled format – for example, to what extent cultural variables may influence relationship formation. This method is beneficial when comparing responses across a diverse set of participants, or when quantifying qualitative data through the use of rating scales or categorical responses.

However, the structured format may not be appropriate for exploratory research that requires flexibility in questioning to follow up on interesting or unexpected responses that arise during the interview. The rigidity of the question set can limit the interviewer's ability to delve deeper into unique participant experiences, potentially missing nuanced insights.

The advantages of using structured interviews include the ease of data comparison across participants due to the standardized question set. This method allows for the quantification of qualitative data, facilitating statistical analysis while still capturing the depth of participants' experiences and opinions. Additionally, their structured nature reduces interviewer *bias*, as the uniform question set limits the influence of the interviewer's perceptions or assumptions on the data collected.

The disadvantages include potential limitations in capturing the full range of participant responses due to the predetermined questions. Respondents may feel constrained by the structured format, possibly leading to incomplete or superficial answers. Moreover, the interview's fixed nature may not allow for the exploration of unforeseen topics or themes that emerge during the conversation, limiting the scope of findings.

TOK

What values, such as those that influence interview questions, determine what counts as legitimate inquiry in the human sciences? How might researchers with different values create different interview questions and therefore different knowledge? What are the implications for certainty and truth in psychology research?

Finally, ethical considerations in structured interviews focus on ensuring informed consent, protecting participant confidentiality and maintaining sensitivity to the topics discussed. For instance, researchers must clearly communicate the interview's purpose, how the data will be used and any potential risks or discomforts to participants. It is important to create an environment where participants feel comfortable providing honest responses, knowing their privacy is safeguarded. Ethical considerations also include the interviewer's ability to handle sensitive topics respectfully and professionally, ensuring that the interview process does not cause distress or harm to the participants.

Semi-structured interviews

Semi-structured interviews can be defined as a research method that employs a flexible interview guide consisting of predetermined questions, but that also allows for the exploration of additional topics as they naturally arise during the conversation. Semi-structured interviews facilitate a balance between obtaining specific information and exploring the interviewees' *perspectives*, experiences and insights in greater depth.

Semi-structured interviews are particularly suitable for research that aims to understand complex phenomena from the participants' viewpoints, allowing for the exploration of themes and issues not initially anticipated by the researcher. This method is valuable in situations where both specific questions of interest and the flexibility to follow up on intriguing or unexpected responses are important. It enables researchers to delve deeper into personal experiences, perceptions and the reasons behind certain behaviors, providing a comprehensive understanding of the subject matter.

However, this method may not be appropriate for research requiring highly standardized data for quantitative analysis, as the variability in responses and the conversation's direction can introduce challenges in comparing data across interviews. The depth and flexibility of semi-structured interviews may also require more time for both conducting the interviews and analysing the data.

The advantages of using semi-structured interviews include the ability to gather detailed, nuanced information about participants' experiences and perspectives. This method allows for the exploration of new themes that emerge during the interview, enriching the data collected. It also allows for the personalization of questions based on the interviewees' responses, enhancing the relevance and depth of the conversation.

The disadvantages include potential variability in the data collected, making it challenging to compare across participants. Their semi-structured nature requires skilled interviewers capable of guiding the conversation effectively while remaining open to exploring emerging topics. Additionally, the analysis of data from semi-structured interviews can be time-consuming and complex, given the richness and diversity of the qualitative data gathered.

Finally, ethical considerations in semi-structured interviews focus on the importance of informed consent, confidentiality and sensitivity to the interviewees' comfort levels. Researchers must ensure that participants are fully aware of the study's purpose, how their data will be used and their rights to withdraw at any time. Ethical practices also involve being attentive to the participants' emotional well-being, especially when discussing sensitive or personal topics.

Focus groups

Focus groups can be defined as a qualitative research method that gathers a small group of demographically similar participants who have other common traits or experiences. In focus groups, discussion is facilitated by a researcher on specific topics, allowing for the exploration of participants' attitudes, perceptions and reactions in a group setting.

Focus groups are especially suitable for research aiming to understand the range of *perspectives* on a topic within a target demographic. They are effective in generating rich discussions that can reveal consensus or diversity in opinions, experiences and preferences, providing insights that might not emerge in individual interviews. Therefore, focus groups are beneficial for exploring people's knowledge and experiences, as the group setting can encourage participants to express thoughts and ideas stimulated by the conversation – for example, where participants have had similar experiences regarding therapy, addiction or trauma.

However, it should be noted, focus groups may not be appropriate for topics that require a high level of privacy or individual disclosure, as participants might be reluctant to share sensitive information in a group. The influence of dominant participants or groupthink can also skew the data, potentially limiting the diversity of viewpoints expressed.

The advantages of using focus groups include the efficient gathering of varied perspectives from multiple participants simultaneously. The interactive setting can encourage participants to explore and articulate their views more deeply, stimulated by the group's dynamics. Focus groups can also be an effective preliminary research tool to identify themes for further study, in-depth interviews or surveys.

The disadvantages involve potential challenges in managing group dynamics, where dominant personalities can overshadow quieter members, affecting the balance of contributions. The facilitator must skillfully navigate these dynamics to ensure a broad range of insights. Analysing data from focus groups can also be complex, given the nuances of group interaction and the non-verbal cues that may accompany verbal responses.

Finally, ethical considerations in focus groups center on informed consent, confidentiality and the respectful handling of group interactions. Participants must be aware of the group nature of the discussion and the confidentiality measures in place to protect their privacy. Ensuring that all participants feel comfortable and respected in expressing their views is important, especially when discussing sensitive topics. Researchers must carefully manage the group process to prevent any participant from feeling marginalized or pressured by the group. Ethical practices also include the careful selection of topics and questions to avoid causing distress or discomfort. This highlights the need for sensitivity and professionalism in conducting focus groups.

Correlational studies

Correlational studies can be defined as a research method that investigates the relationship between two or more variables to understand how they may be related or *change* together.

Correlational studies do not involve manipulation of variables by the researcher; instead, they observe the variables as they naturally occur.

Correlational studies are particularly suitable for exploring the strength and direction of relationships between variables where experimental manipulation is either unethical or impractical – for example, when studying the relationship between lifestyle factors and health outcomes, or the association between educational attainment and income level. This method allows researchers to analyze naturally occurring variables to predict behavior or outcomes based on observed associations, producing positive or negative correlations which can be analyzed.

However, this method may not be appropriate for establishing cause-and-effect relationships, as the correlational design cannot control all possible confounding variables that might influence the observed relationship. The presence of a correlation does not imply causation, and there may be other unmeasured variables influencing the relationship.

The advantages of using correlational studies include the ability to explore complex relationships in natural settings, offering insights into how variables are connected in the real world. This method can handle a wide range of research questions and is relatively straightforward to conduct, especially with the availability of sophisticated statistical analysis tools. It is also invaluable for studying phenomena that cannot be ethically or practically manipulated in experimental research.

The disadvantages include the inability to infer causality from the observed correlations. Misinterpretation of correlational data can lead to incorrect assumptions about the nature of the relationship between variables. Additionally, the risk of spurious correlations, where two variables appear to be related but are actually influenced by another unseen factor, highlights the need for cautious interpretation of results.

Finally, ethical considerations in correlational studies focus on the *responsible* use and interpretation of data, ensuring privacy and confidentiality in data collection, and the transparent reporting of findings. Researchers must be vigilant in not overstating the implications of their findings, especially in communicating the difference between correlation and causation, to avoid misleading interpretations. Ethical practices also include obtaining consent when individual data is collected and ensuring that data analysis and reporting do not harm participants or communities represented in the study.

Case studies

Case studies can be defined as an in-depth exploration of a single unit of study, such as an individual, group, institution or event, to gain a comprehensive understanding of its complexities and the multiple factors influencing its outcomes. Case studies are particularly suitable for investigating phenomena in depth within their natural contexts, especially when the boundaries between a phenomenon and its context are not clearly evident. This method allows researchers to explore the interplay of various factors contributing to the phenomena of interest, offering insights that may not be achievable through other methods. It is valuable for generating hypotheses, building theory, exploring potential *causal* mechanisms in complex systems, and providing rich, qualitative data that contribute to a deeper understanding of the subject matter.

You can read more about this study on page 288.



Ochs (1982) used a case study method by observing 23 children in Samoa every five weeks for a 10-month period to investigate language instruction. The study found that language instruction was characterized as largely elicited by the child's caregiver.

However, case studies may not be appropriate for research aiming to generalize to a larger population or other settings, due to the uniqueness and specificity of the single case or small sample size. The in-depth nature of case studies also makes them time-consuming and resource intensive.

The advantages of using case studies include the ability to obtain a comprehensive and in-depth understanding of the research topic within its real-life context. This method can uncover insights and reveal hidden relationships that might not be apparent in more broad-based studies. Case studies also allow for the examination of contemporary events in situations where the manipulation of variables is not feasible.

The disadvantages include challenges in generalizing findings from a single case or a small number of cases to broader populations or settings. The depth and complexity of the data collected can also pose analytical challenges, requiring careful interpretation and validation of conclusions. Additionally, the researcher's subjective interpretation may influence the study. This highlights the need for rigorous methodological approaches and validation techniques to ensure objectivity and reliability.

Finally, ethical considerations in case studies focus on informed consent, protecting the confidentiality and privacy of participants, and minimizing any potential harm to those involved in the study. When individuals or organizations are subjects of a case study, researchers must navigate ethical issues related to the depth of examination and disclosure of sensitive information. This includes ensuring that participants are fully aware of the extent of the study and their rights to withdraw or limit their participation. Ethical practice also involves the *responsible* handling of data, particularly in presenting findings in a way that respects participants' dignity and confidentiality while accurately reporting the complexities of the case.

Activity 71

Create revision notes by writing a one- or two-sentence definition for each of the following research methods. Then, list the advantages and disadvantages of each using bullet points. You should start to see a pattern: some of the disadvantages (for example, the method may lack ecological validity) are advantages for other methods (they do have ecological validity). Standardize your phrasing and color-code the advantages and disadvantages.

The research methods are:

- experiments (true or quasi-)
- observations (naturalistic or controlled, overt or covert, participant or non-participant)
- surveys/questionnaires
- interviews (structured, semi-structured or focus group)
- correlational studies
- case studies.

Identify how each method connects to the key concepts. For example, covert observations may have implications for *responsibility*, while true experiments are designed to establish *causality*.

Sampling techniques

Researchers cannot research an entire population. They first have to decide what group they are interested in (known as the target population) and then select a group of people from it. This is the sample. The method they use to extract the sample will influence the characteristics of the sample.

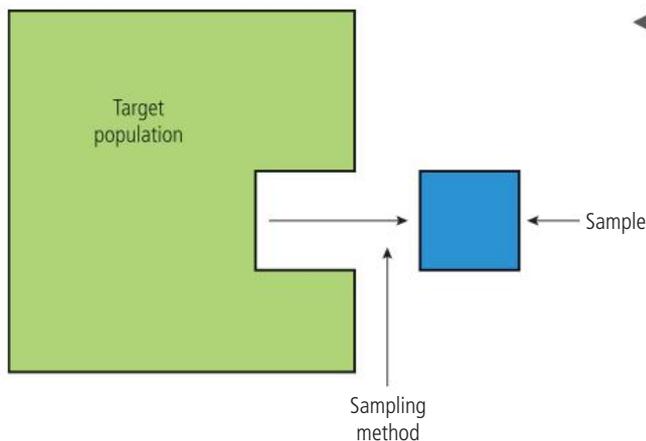


Figure 2.29 A diagram showing the relationship between the target population, sampling method and sample.

TOK

Sampling is one area in which the researcher can impose their own influences on the research. They can do this by stealth, for example, by only recruiting participants that they know will agree with their own biases. This raises questions about the nature of objectivity in psychology research and to what extent psychology research can be trusted.

Self-selected sampling

Self-selected sampling, also known as volunteer sampling, is a method characterized by individuals choosing to participate in a study, often in response to advertisements or invitations. Self-selected sampling is grounded in the willingness and initiative of participants to engage in the research process.

One advantage of self-selected sampling is the high level of engagement from participants, who are likely to have a genuine interest in the study. This can lead to the collection of higher-quality data. Additionally, the ease of recruitment makes this method particularly appealing for studies operating under limited resources, allowing for a quicker and more straightforward gathering of samples.

However, self-selected sampling has the potential for *sample bias*. Given that the method attracts volunteers, the sample may not accurately represent the broader population, as it consists primarily of those motivated to participate. This introduces challenges to the generalizability of the findings, as the results may not extend beyond the specific group of volunteers, limiting the broader applicability of the research insights.

Opportunity sampling

In opportunity sampling, individuals who are readily available and willing to participate are selected for a study. This method is particularly favored by researchers who have access to a certain group of people, or are confined to specific locations due to constraints on time or resources.

An advantage of opportunity sampling is its convenience. The method allows for the rapid and straightforward collection of a sample, making it an ideal choice for studies that require quick data gathering. Furthermore, its accessibility renders it useful for preliminary studies where the scope and resources might be limited, facilitating the initial exploration of a research question with minimal logistical complications.

However, a disadvantage is its lack of representativeness. Since the sample is drawn from a subset of the population that is immediately available, it may not accurately reflect the characteristics of the wider target population. This can introduce a *bias* in the results, as the findings might be influenced by the specific traits of the accessible group rather than the broader population.

Stratified sampling

Stratified sampling segments the population into distinct subgroups, or strata, which are defined by shared characteristics. After dividing the population into these strata, participants are randomly selected from each subgroup. Stratified sampling is designed to ensure the representation of all significant subgroups within the population; it aims for a sample that mirrors the diversity and complexity of the whole.

An advantage of stratified sampling is its enhanced representativeness. By thoroughly identifying and including all pertinent strata, the sample obtained more accurately reflects the entire population. This methodological rigor significantly improves the accuracy and reliability of research findings. Additionally, stratified sampling allows for the comparability of data across the different strata, providing deeper insights and a richer analysis of the population under study.

However, one disadvantage is its complexity, which requires a detailed and comprehensive understanding of the population's characteristics to form the strata accurately. This complexity, combined with the need for random sampling within each stratum, demands significant resources. The increased cost and extended time required to implement stratified sampling may render it challenging for studies operating on tight budgets or schedules, making it a less practical choice for some research contexts.

Random sampling

In random sampling, every member of the target population is given an equal opportunity to be selected. A variety of random selection techniques are used to achieve this fairness.

An advantage of random sampling is that it helps reduce *bias*: each individual has a fair chance of selection, thereby minimizing the chances of selection bias. Furthermore, random sampling enhances the generalizability of the results, making them more likely to be representative of the entire population.

However, one disadvantage is that it can be particularly difficult to execute, especially in scenarios involving large or poorly defined populations. Additionally, random sampling is resource intensive, requiring significant time and financial investment to achieve a truly random sample.

Snowball sampling

Snowball sampling is a non-probabilistic sampling method used primarily in social science research to access hard-to-reach or niche populations. This method relies on the initial identification and recruitment of a few participants who belong to the target group of interest. Initial participants assist in the recruitment of further participants from their social networks or connections, forming a “snowball effect” as the sample size grows (Figure 2.30).

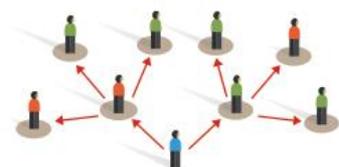


Figure 2.30 How snowball sampling works.

An advantage of snowball sampling is that the researcher can target niche populations who all have the same main characteristics. These may be populations that a researcher may not usually have access to due to issues around confidentiality or sensitivity.

However, the disadvantage of this technique is that it may not secure a sample diverse enough to reflect the broader population accurately. This is because of the interconnectedness inherent in the recruitment process, which may introduce *bias*, complicating the task of generalizing the findings to a wider population. Furthermore, because the participants are usually known to each other to some extent, it can be difficult to maintain full confidentiality.

Activity 72

Consider these scenarios.

Scenario 1: A university is conducting a study on the impact of social media on student productivity. They post flyers across campus asking for volunteers.

- Which sampling method is being used?
- Explain your reasoning.

Scenario 2: A teacher wants to conduct a quick study on student stress levels during exam periods. They decide to ask the students who are currently in the library.

- Which sampling method is being used?
- Explain your reasoning.

Scenario 3: A company wants to study employee satisfaction across different departments. They divide the workforce into departments (HR, marketing, etc.) and randomly select participants from each department.

- Which sampling method is being used?
- Explain your reasoning.

Practical assessment: Classroom sampling

With your classmates, conduct a quick survey about a topic of interest (your favorite types of music, for instance). Use opportunity sampling by asking whoever is immediately around, and then discuss how this might affect the representativeness of your findings.

Repeat the activity using stratified sampling by dividing the class into subgroups based on specific traits (for example, age or gender), then randomly select participants from each group. Compare the results and discuss the advantages and challenges of each method.

Investigating psychological concepts in research methodology

Bias: In what way may our knowledge of human behavior be biased?

Bias in research methodology can manifest through the sampling techniques, data interpretation, and even in the assumptions underlying the research design. For example, researcher bias occurs when the preconceptions or beliefs of the researcher inadvertently affect how data is collected, interpreted or analyzed. This bias can lead to skewed

conclusions that reflect the researcher's expectations rather than the true nature of human behavior. In psychological studies, sampling bias often arises when certain populations, such as WEIRD societies, are overrepresented in research. This can result in findings that are not generalizable to other cultures or groups. Additionally, participant bias, such as social-desirability bias, can occur when individuals alter their responses to appear more favorable or socially acceptable. These biases can distort our understanding of human behavior, limiting the validity of the research findings. Reflexivity, which encourages researchers to reflect on how their own background and assumptions influence their study, is a strategy to minimize researcher bias. Additionally, using multiple researchers (inter-rater reliability) and triangulation of methods can further reduce bias, ensuring that findings are more credible and reflective of diverse perspectives.

Activity 73

Find a psychological study that may have been influenced by researcher or participant bias. Discuss how these biases may have shaped the findings and suggest strategies the researchers could have used to reduce bias.

Causality: How can we know the cause(s) of observed behavior?

Establishing causality in psychological research often requires true experimental designs where variables are carefully controlled. For instance, in a true experiment, the IV is manipulated by the researcher to measure its effect on the DV. By controlling extraneous variables, researchers can more confidently infer that any changes in the DV are due to the manipulation of the IV. A classic example of this is Loftus and Palmer's (1974) study on the impact of language on memory recall. They manipulated the verb used in a question ("smashed" vs. "contacted") to measure its effect on participants' speed estimates of a car crash. Since the environment and materials were consistent across groups, any difference in speed estimates could be attributed to the manipulated language, supporting a causal relationship. However, establishing causality becomes more challenging in quasi-experiments or correlational studies where the IV cannot be randomly assigned, and other uncontrolled variables may affect the outcome. In these cases, causality can only be tentatively suggested. Careful control of variables and use of random assignment strengthen claims of causality in psychological research.

Activity 74

Review another true experiment. Identify how the researchers controlled variables to establish a cause-and-effect relationship. Discuss any challenges or limitations they may have faced in determining causality.

Change: How can we know if a behavior is a result of natural maturation or purposeful intervention?

In research, distinguishing between natural maturation and purposeful intervention requires careful comparison of intervention and control groups. For example, in education settings, a study might examine whether improvements in student performance are due to natural cognitive development or the result of a specific

teaching method. By having an experimental group exposed to the intervention and a control group that is not, researchers can compare the two to see if the changes in behavior are significantly greater in the intervention group. If both groups show similar progress, the change may be attributed to natural maturation. However, if the experimental group outperforms the control group, the difference can be attributed to the intervention. The use of pre-tests and post-tests is another way to control for maturation effects by measuring behavior before and after the intervention. Quasi-experiments, where random assignment is not possible, complicate this distinction because pre-existing differences between groups may confound the results, making it harder to isolate the effects of the intervention.

Activity 75

Choose a study that uses pre-tests and post-tests to evaluate the effectiveness of an intervention. How do the researchers differentiate between changes caused by maturation and those caused by the intervention?

Measurement: How can we express complex psychological constructs in terms of observable, measurable behavior?

Complex psychological constructs, such as anxiety, memory or stress, are often expressed in terms of observable, measurable behaviors through the use of standardized tests, questionnaires or physiological measures. For instance, to measure anxiety, researchers may use both self-report questionnaires (such as the Beck Anxiety Inventory) and physiological indicators such as heart rate or cortisol levels. By operationalizing abstract constructs into concrete, measurable behaviors, researchers can analyze and interpret these constructs more reliably. In the case of memory, tests such as recall tasks or recognition tasks are commonly used to quantify memory performance. The use of such standardized tools allows for the comparison of findings across different studies and populations. However, it is important to consider that these measures might not capture the full complexity of the psychological construct. For instance, self-reports of anxiety may be subject to social-desirability bias, where participants underreport their symptoms to appear more socially acceptable. Therefore, combining multiple measures (triangulation) is often the best strategy to ensure that the construct is accurately captured.

Activity 76

Identify a psychological construct and explore how it has been operationalized in research. What methods were used to measure it, and how do these methods help in making the construct observable and measurable?

Perspective: What are the strengths and limitations of a reductionist approach to studying behavior?

A reductionist approach simplifies complex human behaviors by breaking them down into smaller components for study. For example, in cognitive psychology, memory might be studied by focusing on specific cognitive processes such as encoding, storage and retrieval, rather than considering memory as a holistic construct influenced

by emotions, culture and social interactions. The strength of this approach is that it allows for precise measurement and control of variables, leading to clearer, more testable hypotheses. In experimental research, this can lead to valuable insights about specific mechanisms of behavior. However, the limitation of reductionism is that it may overlook the broader context in which behaviors occur. For instance, while studying memory as a cognitive process, researchers might miss how emotional states or cultural influences affect memory performance. A more holistic approach might consider how different factors interact to influence behavior, offering a fuller understanding. Thus, while reductionism is useful for isolating key variables, it must be complemented by approaches that consider the complexity of human behavior.

Activity 77

Choose a psychological study that used a reductionist approach. Identify the benefits of breaking down the behavior into smaller components for research purposes, but also discuss what important factors might have been overlooked.

Responsibility: Can potential benefits of research justify partial relaxation of ethical standards?

In some cases, researchers may argue that the potential benefits of their studies justify a partial relaxation of ethical standards, but this must be handled with caution. Ethical compromises often occur in cases where obtaining informed consent or maintaining full transparency might alter participants' behavior or invalidate results. For example, observational studies in public settings may not always obtain consent if doing so would interfere with natural behavior, but the research could provide valuable insights into real-world social interactions. Similarly, studies involving deception, such as those using single- or double-blind procedures, may obscure certain details from participants to prevent bias or placebo effects, as in many clinical trials. However, ethical standards such as participant safety, informed consent and debriefing must be rigorously upheld wherever possible to avoid harm. Reflexivity in research helps minimize potential bias, while Research Ethics Committees play a key role in assessing whether the scientific value of the research outweighs the ethical risks involved. Even with a partial relaxation of ethical standards, the primary goal remains to protect participants and ensure that any potential harm is minimized and justifiable based on the anticipated benefits.

Activity 78

Find a study that employed partial relaxation of ethical standards, such as using deception or observational research without full consent. Discuss whether the potential benefits of the research justified the ethical compromise, and evaluate the steps researchers took to protect participants from harm.



CONTEXTS

Learning objective

Students should be able to understand and coherently and accurately synthesize all the contexts with the concepts and contents that are studied in this course.

- Health and well-being
- Human development
- Human relationships
- Learning and cognition

Introduction to contexts

This section focuses on four real-world contexts: Health and well-being, Human development, Human relationships, and Learning and cognition. Each context represents a broad area of human experience in which psychological principles and research can be applied, helping to make sense of complex behaviors and mental processes. In Health and well-being, psychology helps us understand the mental and emotional factors that influence health behaviors, resilience and overall quality of life, offering strategies for managing stress, promoting mental health and fostering positive lifestyle changes. In human development, psychological theories and research on cognitive, emotional and social growth give us insights into the processes that influence behavior and personality from childhood through to adulthood. In human relationships, examining factors such as communication, empathy, attachment and social influence, psychology helps us to understand interpersonal relationships and the ways these affect individual behavior. In learning and cognition, psychology explores how we acquire, process and retain information, helping us understand mental functions like memory, problem-solving and decision-making, which are important for succeeding in everyday environments. As these four contexts are explored, theories and tools learned or acquired in the Contents sections (the biological approach, the cognitive approach, the sociocultural approach, and research methodology) are utilized to make sense of and explain human behavior in everyday situations.



Health and well-being

Introduction to health and well-being

People's understanding of health and well-being has changed over time. It is now understood and accepted in most cultures that physical and mental health are related, each affecting the other. Consequently, the study of physical and mental health has been **synthesized** to create a more holistic and therefore realistic approach to health.



Well-being is closely associated with people's physical and mental health. However, health is different from personal well-being, which describes a person's self-reported sense of a satisfying, fulfilling and happy life. Physical and mental health can be *measured* objectively; however, well-being is self-reported and therefore subjective.



Conceptual question

What challenges arise when trying to objectively *measure* subjective concepts such as well-being?

Mental health disorders



Conceptual question

How might cultural factors *bias* our understanding and diagnosis of mental health disorders?



You should have an understanding of one or more of the following: major depressive disorder, eating disorders, post-traumatic stress disorder, obsessive compulsive disorders, anxiety disorders.

Area of study	Learning objectives
Biological explanations	One or more biological explanations of one mental health disorder.
Cognitive models	The value of cognitive models in understanding a mental health disorder.
Cultural differences	Factors that may explain the difference in prevalence rates for mental health disorders between cultures and/or populations. Examples of cultural differences in approaches to mental health.
Environmental factors	The role of environmental factors in understanding/explaining mental health disorders.

Table 3.1 Mental health disorders learning objectives from Subject Guide, page 28.

Biological explanations

Anxiety disorders are mental health conditions marked by uncontrollable and excessive worry about possible events. They significantly reduce a person's ability to function. Anxiety is not fear, which relates to a current, real situation rather than a future, possible situation.

Examples of anxiety disorders include generalized anxiety disorder (GAD), social anxiety disorder, separation anxiety disorder and panic disorder. An anxiety disorder diagnosis is made by a medical professional on the basis of a range symptoms and the frequency of anxiety episodes.

Anxiety disorders can be influenced by a variety of biological factors. Imbalances in neurotransmitters, such as low levels of serotonin, insufficient gamma-aminobutyric acid or excess dopamine, can contribute to the development of these disorders. Genetic variations, such as those in the 5-HTTLPR gene, which regulates serotonin transport, may also increase the likelihood of anxiety. Additionally, hormonal imbalances, particularly elevated levels of cortisol (the stress hormone), play a significant role in triggering anxiety. Certain health conditions, including hyperthyroidism, chronic illnesses and the side effects of medications, can also contribute to anxiety disorders. Furthermore, chronic stress, whether due to traumatic events or prolonged stressful conditions in living, working or studying environments, is a significant factor in the onset of anxiety disorders.

Critical thinking

To what extent do biological factors and life experiences interact to contribute to the development of anxiety disorders?

Does considering only biological explanations of anxiety disorders lead to an incomplete understanding of its etiology?

Consider genetic predispositions, neurotransmitter imbalances, and the function of different brain structures such as the amygdala interacting with life experiences such as childhood trauma and stress to influence the development of anxiety.

To what extent does solely focusing on biological variables leave researchers vulnerable to overlooking the role of environmental or cognitive influences, such as learned behaviors or distorted thinking?

To what extent do the biopsychosocial model and the diathesis-stress model lead to a more valid understanding of anxiety disorders?



Activity 79

Through discussion with your class members, distinguish between fear and anxiety. Create a one-page graphical representation of the biological explanations for anxiety.

Key study**Chavanne and Robinson (2021)**

Aim To determine whether anxiety disorders have a biological etiology.

Method A meta-analysis of published research articles that contrasted anxious patients and control subjects for PTSD, social anxiety disorder, GAD, panic disorder and specific phobia. 181 articles met the study's selection criteria.

Results Induced anxiety (anxiety caused by an identified event) and pathological anxiety (anxiety resulting from an undetermined biological factor) both showed increased activation in the insula, which is located deep within both sides of the brain, and in the cingulate cortex and medial prefrontal cortex, both of which are located in the center and front of the brain, respectively. The left and right insula are associated with emotional processing, and the cingulate cortex and medial prefrontal cortex are associated with regulating emotional responses and decision-making.

Conclusion This meta-analysis supports the assumption that some neurobiological mechanisms are *causal* factors in some anxiety disorders.

Critical thinking

Biological explanations can be reductionist, which means they simplify complex psychological phenomena such as anxiety disorders to only biological factors, such as neurotransmitter levels. This overlooks the complex nature of anxiety, which is likely also to be *caused* by cognitive, social, cultural and environmental factors.

Genes, such as 5-HTTLPR, have been implicated in anxiety disorders, but the relationship between genetics and anxiety is complex. It is increasingly likely that many genes interacting with environmental factors may lead to anxiety disorders, so focusing on one gene may be simplistic.

The effects of hormones vary widely between different people and situations, so the role of cortisol in anxiety disorders is unclear and not yet well understood, and may interact with other factors.

Health conditions and their treatments often affect anxiety, but the interactions between physical health, medication and secondary psychological issues are complex; biological explanations seldom consider these interactions.

Stress is an important factor in anxiety disorders, but it is not a solely biological factor; it is influenced by a person's cognitive processes and environmental factors.

Meta-studies, which combine results from many studies, are prone to statistical inaccuracies because of the differences in study design, sample sizes and the methods used. Meta-studies rely on existing research and do not generate new data, which means they perpetuate existing *biases*.

Anxiety disorders manifest differently in different individuals and in different cultures; biological explanations do not consider the unique experiences and *perspectives* of every individual.



Etiology refers to the source or origin of a behavior. For example, the etiology of anxiety may be genetic, it may be environmental, or it may be a combination of both.



Is a meta-study a research method? To what extent are biological explanations of anxiety reductionist? Is reductionism a positive or negative concept in determining the cause of anxiety?

Activity 80

Chavanne and Robinson (2021) used brain imaging studies. In pairs, discuss how you think the findings from brain imaging studies, like this one, could influence the future treatment of anxiety disorders.

Cognitive models

A cognitive model is a theoretical framework used to understand how mental processes, such as memory, reasoning and problem-solving, affect or are affected by behaviors.

Cognitive models describe people's perceptions and interpretations of, and responses to, their environment based on their cognitive processes.

Cognitive models, such as the Cognitive Behavioral Model of Generalized Anxiety Disorder (the "Laval model") (Kuzo et al., 2021) are valuable tools for understanding mental health disorders. They provide a structured framework for analyzing cognitive processes that contribute to behaviors like anxiety, highlighting how thoughts, beliefs and attitudes can influence the development and maintenance of the disorder. These models identify maladaptive thought patterns and cognitive distortions (such as overgeneralizing, catastrophizing and irrational worry) that perpetuate anxiety.

Critical thinking

How might cognitive distortions such as catastrophizing affect an individual's response to stress in everyday life?

By focusing on these distortions, cognitive models guide therapeutic interventions such as CBT, promoting more realistic thinking. For instance, the Laval model (Figure 3.1) addresses specific factors in GAD, such as using worry as a coping strategy, cognitive avoidance and intolerance of uncertainty.

Cognitive models are typically supported by empirical, evidence-based research, which strengthens the efficacy of treatments. While they emphasize cognitive aspects, these models can be integrated with other approaches to provide a more comprehensive understanding of behaviors and aid clinicians in predicting treatment outcomes by identifying significant factors in a patient's behavior.

Mental health disorders are complex, and a detailed understanding usually means integrating cognitive models with biological, emotional and social *perspectives* to be sure all factors are addressed.

The Cognitive Behavioral Model of Generalized Anxiety Disorder

- Intolerance of uncertainty: The negative response to situations that are uncertain or ambiguous.
- Positive beliefs about worry: The incorrect belief that worrying in itself can be a problem-solving strategy and the irrational belief that worrying will somehow prevent negative outcomes.
- Negative problem orientation: An individual's negative evaluation of their ability to solve their problems.
- Cognitive avoidance: The strategies that people use to avoid anxious thoughts or feelings, such as suppressing worry or avoiding situations that prompt worry.

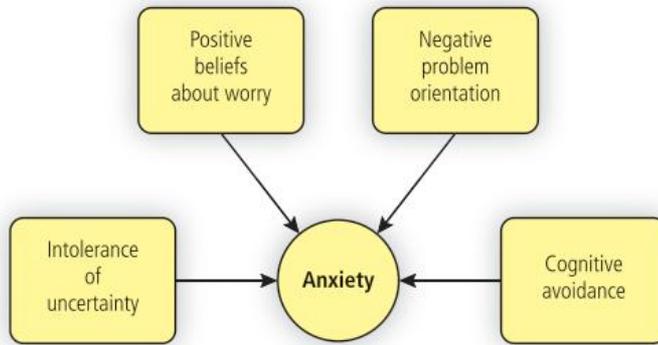


Figure 3.1 The Cognitive Behavioral Model of Generalized Anxiety Disorder (the Laval model).

Critical thinking

Cognitive models such as the Cognitive Behavioral Model of Generalized Anxiety Disorder help us to understand the cognitive processes that lead to and exacerbate anxiety disorders. These models offer useful templates for education and therapeutic interventions. However, cognitive models can oversimplify the complex interactions between emotions, cognitive processes and behavior, and are unlikely to describe or explain underlying biological or environmental *causal* factors.

Cultural differences

Different cultures have different *perspectives* on mental health. Some cultures consider mental health issues to be a weakness, or they simply do not recognize mental health issues as medical health issues, making it difficult for people with mental health problems to be helped. Cultural taboos can prevent people in some cultures from sharing their symptoms with others, which hinders access to professional treatment.



Conceptual question

How do different *perspectives* and cultural stigmas around mental health impact the willingness of individuals to seek treatment for anxiety disorders?

Culturally diverse communities (communities in which people from many cultures live closely together) sometimes have higher rates of mental health disorders due to acculturative stress, language barriers, socioeconomic disparities and discrimination. Differences in values can affect the apparent prevalence – that is, the total number of cases of a condition or disease in a population at a specific time – of mental health disorders within different cultures.

Critical thinking

How might acculturative stress in multicultural communities contribute to the development of anxiety disorders? Consider the challenges of fitting into a new culture, for example discrimination against outsiders, language barriers, or pressure to conform, that can create low-level, but long-lasting stress. Also consider the role of social support networks and a person's resilience in mitigating or exacerbating the stress associated with moving into a new culture, and link this to the diathesis-stress model or the influence of environmental factors.

TOK

To what extent can models such as the Cognitive Behavioral Model of Generalized Anxiety Disorder be described as reductionist? Do models make concepts easier to understand?

You can read more about this study on page 151.



Key study

Baldwin et al., 2011

A review of research studies on GAD conducted in Europe suggests a lifetime prevalence of 4.3–5.9 percent: between 4.3 percent and 5.9 percent of people are diagnosed with GAD in their lifetime (Wittchen and Jacobi, 2005). GAD is more common in women, and it is the most common anxiety disorder among those aged 55–85 years old.

Anxiety in the USA and Japan

In the USA, GAD is typically treated through a biomedical approach that combines psychotherapy and medication. CBT is commonly employed to help patients identify and change negative thought patterns and behaviors that contribute to anxiety, while teaching coping strategies to manage stress. Medications such as SSRIs and benzodiazepines are also frequently prescribed to regulate neurotransmission and reduce the physiological symptoms of GAD. Patients are often encouraged to join support groups where they can share experiences and coping strategies with others. Additionally, complementary treatments like meditation and physical exercise are sometimes recommended to further manage symptoms and enhance overall well-being.

In Japan, the treatment of GAD often incorporates traditional practices alongside biomedical approaches, reflecting the country's cultural attitudes toward mental health. While CBT is used, there is often greater emphasis on culturally specific therapies like Morita therapy, which is rooted in Zen Buddhism and encourages patients to accept anxiety as a natural part of life; rather than trying to eliminate anxiety, it focuses on purposeful activities and self-reflection. Medications such as SSRIs and benzodiazepines are prescribed, though the approach tends to be more cautious (there is some stigma surrounding psychiatric drugs). Traditional herbal remedies, such as *Kampo* medicine, are often considered more acceptable alternatives. Strong community and family relationships play a central role in treatment, with family members often involved in the process to prioritize social harmony, unlike in the USA, where support groups are more common. Therapeutic practices such as calligraphy (*shodo*), flower arranging (*ikebana*), tea ceremonies and other traditional arts are also used to promote personal calm and help manage GAD (Figure 3.2).

In summary, while both Japanese and US cultures combine therapy and medication, the USA tends to focus on an individualized, biomedical approach using CBT techniques and pharmaceutical interventions. Japanese culture incorporates traditional therapies and emphasizes family and community support, reflecting the Japanese cultural values of social harmony and acceptance of anxiety as a typical human experience.



Figure 3.2 Biomedical and traditional practices can be used to treat GAD.

Key study

Marques et al. (2017)

This meta-study showed that panic disorder is more prevalent in the USA and Europe than in most other countries/regions. The US and European rates for GAD were within the international range and, in general, the lower rates for all anxiety disorders were in Asia and Africa. These disorders were also lowest among people of Asian and African descent living in the USA. The meta-study noted differences between the Diagnostic and Statistical Manual (DSM) criteria and local descriptions of anxiety disorder. These differences may arise because of different definitions of social anxiety – the significance given to the symptom of worry in GAD.

Critical thinking

Researchers face a challenge when describing global or inter-cultural prevalence rates of anxiety disorders when there are significant differences in the way anxiety disorders are defined or described. Tempting though it is to suggest that the DSM be applied to cross-cultural studies, it would be inappropriate to globalize the descriptions of behaviors that are essentially socio-cultural in nature.

Anxiety is a deeply personal health problem that requires description by the patient. As mental health is perceived differently in different cultures, personal experiences and therefore descriptions of anxiety will differ by language and by personal understanding.

Environmental factors

Environmental factors (such as childhood experiences, social and physical environments, social and cultural influences, stressful life events, biological and environmental interactions, and access to care) can interact with genetic predispositions to affect the onset, development and significance of anxiety (Figure 3.3).



Figure 3.3 There are many environmental factors which may affect anxiety.



Conceptual question

How might the memory and impact of early life experiences *change* or *cause* people more or less stress in adulthood?

Early life experiences, such as neglect, abuse or loss during childhood, can lead to long-term psychological effects that increase the likelihood of anxiety developing later in life. Parenting styles, family dynamics and a parent's mental health also play a crucial role in shaping a child's psychological development. In terms of the social environment, isolation and loneliness can initiate or exacerbate anxiety, while supportive social relationships can offer protection against it.

Socioeconomic factors, such as poverty, unemployment and limited access to quality education and healthcare, are associated with higher anxiety rates due to the stress they create. Physical environments characterized by poor living conditions or unsafe neighborhoods may also contribute to anxiety, with high crime and violence further elevating the risk.

Cultural and societal influences, including norms, beliefs and attitudes toward mental health, impact how anxiety disorders are expressed, understood and treated, with stigma and discrimination often preventing people from seeking help. Exposure to media, including social media, is also a significant factor that can contribute to anxiety.

Stressful life events such as the death or serious injury of a loved one, job loss, divorce or career changes can exacerbate anxiety disorders, while sustained work-related stress or difficult relationships may drive their development and escalation. Biological and environmental interactions can trigger gene expression through epigenetic mechanisms, and exposure to substances like drugs, alcohol and certain medications can disrupt neurotransmitter function, increasing the risk of anxiety.

Finally, limited access to high-quality mental healthcare can result in untreated or poorly managed anxiety disorders becoming more severe over time.

GAD is a common mental health disorder; however, its etiology has not been well studied. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-III), published in 1980, GAD was diagnosed in patients who experienced persistent anxiety but who did not show symptoms of other anxiety disorders, such as panic disorder or obsessive compulsive disorder (OCD). In DSM-III-R and DSM-IV, the emphasis in GAD's symptoms shifted to excessive worry as its defining feature.

Activity 81

Carry out some research about the treatment of GAD. How has the changing definition of GAD affected the way it is diagnosed and treated over time?

Key study

Gosselin and Laberge (2003)

Gosselin and Laberge (2003) aimed to clarify the etiology of GAD by reviewing the published literature on GAD, examining existing theories and models of the disorder. Many studies suggest that environmental factors are implicated in the etiology of GAD. The first environmental factor documented was significant, negative and unexpected life events. The study found that the occurrence of one or more significant, negative and unexpected life events was associated with an increase in the risk of developing GAD. Familial problems such as conflict and abuse were considered stress-inducing and therefore were considered an etiological factor. Separation during childhood, lack of social interaction, poor life satisfaction and a relative having an anxiety disorder were also considered etiological factors. Some cognitive factors such as intolerance of uncertainty, inaccurate beliefs about worry and cognitive avoidance were also etiological factors in the development and maintenance of GAD. Gosselin and Laberge proposed a model showing that GAD is caused by psychological vulnerability that is only activated when the patient experiences tension resulting from a significant, unexpected, negative event.

Critical thinking

Gosselin and Laberge (2003) is a meta-study and so encompasses the results of many carefully selected studies; therefore, its conclusion is comprehensive and representative.

Most of the studies included in the meta-study used the now out-of-date conceptualization of GAD that gave less prominence to significant worry as a key characteristic of anxiety disorder.

Gosselin and Laberge (2003) is now more than 20 years old, and a significant number of studies have been published since, particularly relating to epigenetics.

Cross-culturally, GAD remains poorly defined and not widely recognized.

Epigenetics refers to how behaviors and environmental factors can cause changes in the way genes are expressed without altering the DNA sequence. These changes can affect how cells read genes, turning them "on" or "off", and can affect traits and characteristics.



Activity 82

Carry out some research into epigenetics. In what ways can epigenetic changes be influenced by environmental stressors and potentially lead to anxiety disorders?

Health problems

Area of study	Learning objective
Prevalence of health problems	Factors that may explain changes in the prevalence of one or more health problems in a population. Factors that may explain differences in the prevalence of one or more health problems between populations.
Social learning and health	The role of social learning in understanding one or more health problems.
Stress and health	The role of stress in one or more health problems.

Table 3.2 Health problems learning outcomes from Subject Guide, page 28.

Obesity is a medical condition characterized by excessive body fat. It can create a significant risk to a person's health. Obesity can result in an increased risk of many health problems such as heart disease, diabetes, high blood pressure and some cancers.

Critical thinking

Does the relationship between stress and obesity help explain the rise in obesity rates in stressful environments?

Does chronic stress trigger hormonal responses, such as increased cortisol that can lead to stronger appetite and fat accumulation?

To what extent do behavioral factors like stress-induced overeating or reduced enthusiasm/motivation for activity connect with broader psychological concepts like the biopsychosocial model and the role of environmental stressors in health and behavior?

Consider alternative hypotheses: do both obesity and stress stem from a common unidentified factor, for example, genetic predispositions, socioeconomic status, or lifestyle factors, rather than being directly related to each other?

Obesity is widely *measured* using the Body Mass Index (BMI), which indicates a person's weight (kilograms) divided by the square of their height (meters) – that is, kg/m. A person with a BMI of 30 or greater is classified as obese. It should be noted that BMI is often criticized for oversimplifying health assessments by not accounting for factors like muscle mass, bone density, ethnicity and overall body composition.

Obesity is the result of a combination of genetic, behavioral and environmental factors (including hormonal disfunctions, eating disorders and insufficient physical activity) and, to a lesser extent, social, cultural and economic factors.



You should have an understanding of one or more of the following: **obesity**, drug misuse or abuse, or social media addiction.

Critical thinking

What are the limitations of using BMI as the primary measurement for assessing obesity, and how might alternative metrics offer a more comprehensive understanding? Think about how BMI oversimplifies health assessments by ignoring muscle mass, the distribution of fat around the body, and people's metabolism, which can result in misclassification. Also consider alternative measures, for example body fat percentage, waist-to-hip ratio, or metabolic markers, which give a more nuanced view of a person's weight and health. Link this to broader societal implications, such as the impact of weight stigma on a person's mental health and the value of adopting multi-dimensional approaches to health assessments.

Prevalence of a health problem

The obesity prevalence rate is the proportion of individuals within a target population who have a BMI greater than or equal to 30 kg/m². The prevalence rate is usually expressed as the percentage of obese people in the target population.

- Within a population: The obesity prevalence rate within a specific sub-population (for example, within New York City, USA or New South Wales, Australia) refers to the percentage of people in that sub-population who meet the criteria for obesity. Knowing the obesity prevalence rate helps public health officials understand the extent of the issue locally and try to generate effective interventions.
- Between populations: Comparing different populations' obesity prevalence rates highlights variations in obesity across demographic, cultural and socioeconomic groups. *Causal* factors of the differences can include the availability of and preference for different foods, different levels of physical activity, different access to education and healthcare, and different cultural norms regarding eating behavior, physical activity and body weight.

For example, the UK Government's Obesity Profile update: July 2022 for 2021–22 indicated that 63.8 percent of English people aged 18 years and over were estimated to be overweight or obese. In 2020–2021 the prevalence rate for the same country and age range was 63.3 percent. The obesity prevalence rate in England was lower among women (58.4 percent) than men (69.1 percent). By contrast, obesity prevalence rates in Scotland were higher than the overall UK rates: 29 percent (Scotland) vs. 28 percent (UK). Globally, 13 percent of adults are obese, compared to 29 percent in Scotland.

Factors that may explain changes in the prevalence of obesity within a population

Key study

Marques-Vidal et al. (2010)

Aim To determine the extent to which obesity and educational level in Switzerland's adult population are related.

Method Four cross-sectional health interview surveys were conducted: 1992–93 (n = 14,521), 1997 (n = 12,474), 2002 (n = 18,908) and 2007 (n = 17,879). The participants' BMI was gathered from self-reported data. Participants were categorized by age: 18–44, 45–64 and 65+ years, and by education level: low (no education or only elementary school), middle (middle and upper secondary) and high (tertiary) education.

Participants Swiss adults aged 18–102 years old.

Results Obesity was defined as a BMI of greater than or equal to 30 kg/m^2 . The mean (\pm standard deviation) BMI increased from 24.7 ± 3.6 in 1992/93 to $25.4 \pm 3.6 \text{ kg/m}^2$ in 2007 in men and 22.8 ± 3.8 to $23.7 \pm 4.3 \text{ kg/m}^2$ in women. Between 1992/93 and 2007, the prevalence of obesity increased from 6.3 percent to 9.4 percent in men and from 4.9 percent to 8.5 percent in women. The rate of increase in the prevalence of obesity was greater between 1992/93 and 2002 (men: +0.26 percent/year; women: +0.31 percent/year) than between 2002 and 2007 (men: +0.10 percent/year; women: +0.10 percent/year) (Figure 3.4).

The increases were larger in the low-education stratum compared to the high-education stratum. BMI was strongly associated with low educational level among women over all time periods of the study. The association between education level and BMI was similar but less significant among male participants.

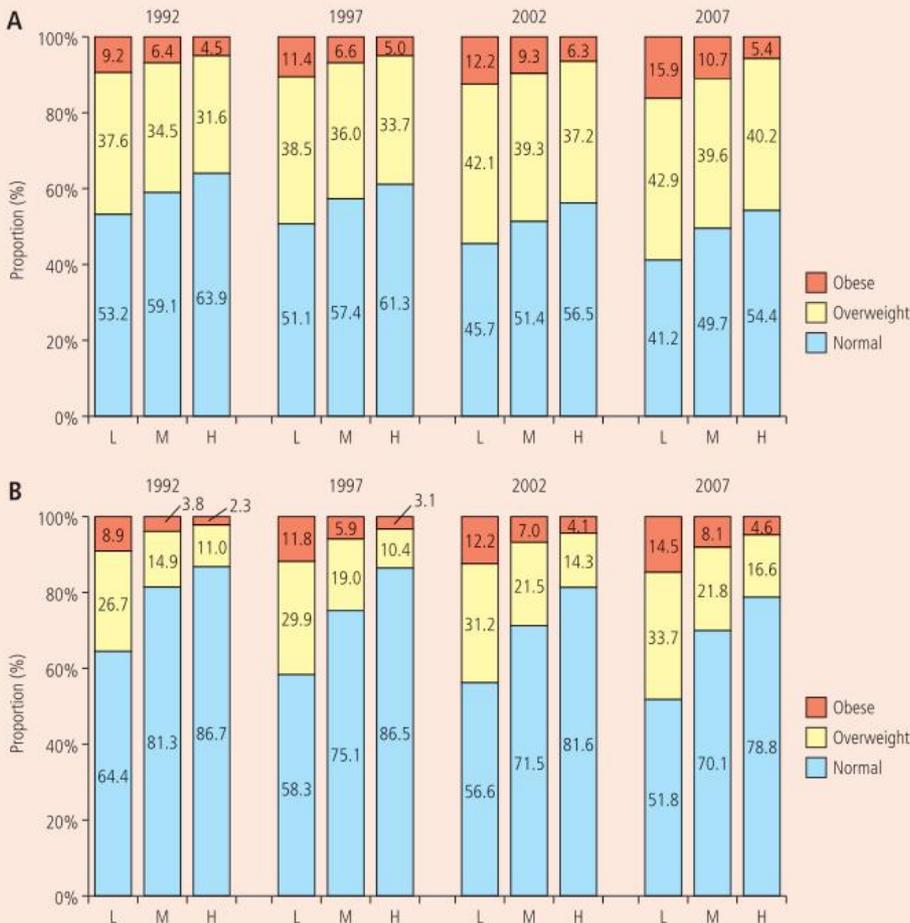


Figure 3.4 Prevalence of BMI categories according to sex, survey year and educational level. (Panel A: men; panel B: women. Educational level: L, low; M, middle; H, high.) (From Marques-Vidal et al., 2010).

Conclusion In Switzerland, in the 1992–2007 period, the increase in the prevalence of obesity was associated with low education in both men and women. The increase in the obesity prevalence was greater in the low-education stratum of the population, suggesting that obesity preventive measures could be targeted according to educational levels.

What are the underlying assumptions in correlating education level and obesity? Can education level be objectively measured?

TOK

Critical thinking

The study spans a period that is not very current and so its relevance to obesity prevalence is questionable.

Self-reported BMI data is unreliable due to under-reporting or over-reporting of weight and height.

The cross-sectional design of the surveys limits the researchers' ability to determine a cause-and-effect relationship between education level and obesity. Correlations can be identified, but it is not possible to determine whether low education results in higher BMI.

The study showed a greater increase in obesity among participants with lower education levels, but given the participants' age range, the definition of "education level" is not a constant factor: low education for a 65-year-old is a different experience than low education for a 25-year-old.

The association between low-education level and higher BMI is stronger in women than in men, indicating possible gender-related factors affecting obesity.

Factors that may explain differences in the prevalence of obesity between populations

Key study

Dutton and McLaren (2011)

Aim Dutton and McLaren (2011) examined sociodemographic and behavioral variables to try to explain the variation of obesity in Canada. The study's aim was to determine the extent to which regional variations in average BMI can be attributed to common determinants of obesity and how much is attributable to the idiosyncrasies of the region (regional effects).

Method This study used data from Statistics Canada's Canadian Community Health Survey, which collects health and demographic information from people of all ages living in Canada. The survey includes people of all ages living in Canada with the exclusion of people living on Crown lands or Indigenous people's reserves, institutional residents, full-time members of the Canadian armed forces, and people living in the Territories or remote areas of the provinces. The study focused on people aged 20–64.

Results Some differences (for example, the average BMI for males in Quebec compared to the Atlantic provinces) were largely explained by differences in sociodemographic and behavioral factors, while differences in the average BMI for females in Quebec compared to the Atlantic provinces were largely explained by the different effects of the factors on BMI.

Conclusion There is regional variation in BMI among females, particularly between those living in Quebec compared to those living in the Atlantic region. For males, however, the average regional variation in BMI is less pronounced and can largely be explained by differing levels of covariates. These gender differences suggest that males may be more resilient than females to regional influences on BMI.

Critical thinking

The study is based on a self-report questionnaire, the content of which was not verified, so there is no way to know if participants responded honestly and accurately.

There is a possibility of endogeneity (that is, a variable is correlated with an error, possibly leading to a biased estimate) because it is not clear if the regional BMI differences among females cause certain health behaviors or whether these behaviors lead to the BMI differences. For example, do people who participate in exercise have lower BMIs because they exercise, or do people with lower BMIs participate in exercise because they find it easier?

Social learning and health

Social learning theory (SLT) suggests that people learn behaviors, attitudes and emotional responses by observing and mimicking influential others such as parents or guardians. SLT emphasizes role-modeling, copying or imitating, and reinforcement in the process of acquiring new behaviors. It shows that both environmental and cognitive factors affect how and what people learn during social interactions.

Critical thinking

How might SLT explain the current trend of child obesity in a media-rich society?

Consider that children may model behaviors they see in media, such as unhealthy eating or sedentary lifestyles promoted by influencers. Think about vicarious reinforcement, where children see unhealthy behaviors rewarded. Consider also some of the broader psychological concepts, such as the impact of the environment and a person's culture on their behavior and also the possibility of interventions using positive role models in media to promote healthier eating and activity.

SLT helps to explain obesity by showing that observational learning and reinforcement contribute to eating behavior and physical activity. Some people learn eating behavior and food choices by imitating others, especially influential role models such as parents, friends and “heroes” from the media such as entertainment or sports celebrities. If a child consistently sees their parents or peers eating high-calorie food, they are likely to make similar eating choices. Similarly, if someone observes friends, colleagues or celebrities engaging in sedentary lifestyles, they are significantly more likely to lead an inactive lifestyle.

Activity 83

Think about your own eating habits at home. How have the habits of those around you affected your habits? Do you consider your food influences to be healthy or unhealthy? To what extent can parents' eating habits impact their children's long-term health outcomes? Write down three ways in which your eating habits are influenced by those around you – family or friends.

Positive and negative reinforcement affects whether or not behaviors related to eating and physical activity are imitated. If someone feels rewarded through comfort by consuming high-calorie foods during episodes of stress, this is an example of positive reinforcement, and they may repeat such emotional eating patterns to receive the same reward.

Cultural and social values toward body image, eating behavior and physical activity affect people's choices related to their weight management because people's perceptions of what is generally desirable is likely to affect eating and physical activity habits.



Conceptual question

How do cultural perspectives and attitudes towards body image and health contribute to variations in obesity rates across different societies?

Environmental factors (such as the easy availability of healthy foods and recreational facilities) and socioeconomic factors (such as having sufficient money to pay for healthy meals and sports equipment) influence the main *causal* factors of obesity.

Critical thinking

How do socioeconomic differences affect the availability of healthy food and how can this have an influence on obesity rates?

Think about how some people have limited access to affordable, nutritious food because of their lower-income status. Think about how this disparity affects both physical and psychological health, for example increased stress and reduced self-efficacy in making healthy choices.

Example scenario

Alex, a 15-year-old high school student, was obese. Social learning factors were integral to his family situation. Growing up, Alex frequently observed both his parents working long hours and often exhibiting signs of stress. The family relied on fast food, takeout and delivered meals for convenience. Alex's parents struggled with weight issues. Both measured above the BMI threshold of 30 the long work hours left them with little time to engage in physical activity. Their lifestyle was sedentary, with an above average consumption of low-nutrition, high-calorie food.

Alex's brother, Christian, was two years older than Alex and already had a BMI greater than 30. Christian often consumed fast food, snacks and sugary drinks while playing computer games late into the night. Alex looked up to his brother and was influenced by his behavior so, as expected, he adopted similar eating behaviors, especially during stressful times at school such as during exams or when experiencing relationship problems.

In school, Alex heard stories from his peers, influenced by television programs, involving late-night fast-food runs, sugary drinks and snacks after sports events. Feeling pressure to fit in with his school peers and seeking social acceptance (as is the norm with adolescents in his culture), Alex also engaged in these behaviors, exacerbating his unhealthy lifestyle.

Alex lacked positive role models for a healthy lifestyle. His family's habits, the influence of his peers, and his deep desire to belong to his peer group led Alex to make poor eating and drinking choices and to adopt a relatively sedentary lifestyle, contributing to his obesity.

This anecdotal scenario illustrates how social learning from family and peers can affect a person's behavior relating to food consumption and physical activity and so contribute to the development and maintenance of obesity during adolescence.

Activity 84

In pairs or small groups, discuss the following questions:

How do time constraints and family dynamics affect the likelihood of adopting unhealthy eating behaviors in adolescence?

How do sibling relationships influence the formation of unhealthy habits, and how might this dynamic be leveraged to promote healthier behaviors?

To what extent does peer pressure shape unhealthy eating habits, particularly during adolescence?

Key study

Christakis and Fowler (2007)

Aim To determine whether weight-gain in one person is associated with weight-gain in their friends, siblings, spouse and neighbors.

Method The study included a social network of 12,067 people as part of the Framingham (USA) Heart Study. Longitudinal statistical models and methods were used to conduct a quantitative analysis to determine the extent to which social proximity in the 1971–2003 period was a *causal* factor of obesity.

Results The probability of a person being obese increased by 57 percent if they had a friend who became obese. If one adult sibling became obese, the chance that another sibling would become obese increased by 40 percent. If a spouse became obese, the probability that the other spouse would become obese increased by 37 percent. Consistent with Bandura's social learning theory (1977), people of the same gender had a greater influence than those of the opposite gender on each other's obesity.

Conclusions Christakis and Fowler (2007) concluded that network factors are relevant to the biological and behavioral factors leading to obesity and that obesity appears to spread throughout social networks.

Critical thinking

Christakis and Fowler's (2007) conclusions are consistent with Bandura's social learning theory study, which was conducted in the early 1960s, even to the extent that males are more likely to mimic other males' behavior and females are more likely to mimic other females' behavior.

The study was conducted in the USA; it is not clear if the same results would be indicated in more collectivist cultures.

The study was published in 2007 but was based on research results from many years earlier; it is unclear if the same results would be achieved if the study were conducted now.

Critical thinking

Can social networks play a role in promoting healthier behaviors, and how might they be used to combat the spread of obesity?

How might the findings of Christakis and Fowler (2007) vary in cultures where collectivism, rather than individualism, plays a more significant role in shaping behavior?

Stress and health problems

Fundamentally, obesity is caused by a person consuming more energy than is used. The reasons for this surplus consumption of energy are complex. Stress (the human body's response to perceived threats, triggering mental and physical responses) is a significant *causal* factor in the development and maintenance of obesity. Stress prompts cortisol to be released into the bloodstream. Cortisol is a hormone that increases a person's appetite for high-calorie and fatty foods. Chronic (sustained) stress keeps the level of cortisol in the bloodstream high and so contributes to an individual's sustained consumption of excess food and drink relative to their activity level, leading to weight-gain. To a lesser extent, stress also alters metabolism, making it more difficult for a person to use calories efficiently, meaning excess fat accumulates.

Many people cope with stress by consuming comfort foods, which are typically high in fat and sugar. This behavior triggers the release of dopamine, a hormone linked to feelings of happiness and pleasure, but it also leads to excessive calorie intake and weight-gain. Stress also disrupts sleep, interfering with the regulation of ghrelin, the hormone responsible for hunger, which further increases appetite and food consumption. Additionally, stress can deplete energy levels and reduce motivation, resulting in less physical activity, which compounds weight-gain.

For some, stress drives unhealthy coping mechanisms such as smoking, alcohol consumption, drug misuse and overeating. Chronic stress, which is often associated with depression and anxiety, further exacerbates these unhealthy behaviors, leading to reduced physical activity and weight-gain. Socioeconomic factors can intensify the effects of stress, as lower-income individuals often have limited access to healthy food and rely on cheaper options, which are frequently high in sugar and fat. High-stress environments, such as demanding work or academic situations with high expectations, contribute to chronic stress, which can lead to overeating as a coping mechanism, ultimately resulting in obesity.

Activity 85 (CAS)

Create a poster that can be used around your school to improve the community's understanding that over-consumption of low nutrition, high-calorie food and lack of exercise can cause obesity among other serious health problems.

Key study

Dockray et al. (2009)

Aim To examine the associations between cortisol secretion and higher BMI.

Methods British children (n = 111, 8–13 years old) and one parent of each child completed structured interviews. A checklist was used to assess symptoms of depression and cortisol reactivity, and physical examinations were used to determine the participants' BMI.

Results Depression was positively correlated with BMI in boys and girls. Neither the children's age nor their physical activity levels were correlated with their BMI. In girls, there was a positive correlation between depression and BMI due to their cortisol reactivity; that is, cortisol reactivity acts as an intermediary factor because depression leads to cortisol reactivity, which leads to a high BMI.

Conclusions Psychological states such as depression can lead to childhood obesity due to cortisol reactivity.

Critical thinking

The study was published in 2009, meaning the study research was conducted more than 20 years ago. This is a relatively long time in terms of biological research, and it is likely that more recent research is available.

The study used structured interviews, which means many untrained research assistants can conduct the interviews and many participants can be included in the study. An **unstructured interview** might have allowed the researcher to gather even more information relating to *causes* of childhood obesity such as the children's feelings about their home or school situations.

The study was conducted in the UK, which is a multi-cultural population. The study gives no information about the participants' ethnicity and cultures, both of which may affect the children's depression, stress levels and lifestyles, including typical eating and exercise behavior.

Activity 86 (CAS)

Can you design a simple team game to get your class to have fun and exercise together?

Prevention and treatment

Area of study	Learning objective
Biological treatment for one disorder	The explanation and effectiveness of one or more biological treatments of one or more mental health disorders.
Prevention and/or treatment for one health problem	The effectiveness of one or more prevention and/or treatment strategies for one or more health problems.
Psychological treatment for one disorder	The explanation and effectiveness of one or more psychological treatments of one or more mental health disorders.



You should have an understanding of prevention and treatment in relation to mental health disorders and health problems.



Table 3.3 Prevention and treatment learning outcomes from Subject Guide, page 29.

Biological treatment for one disorder (anxiety)

One biological treatment of anxiety uses medication (for example, SSRIs) that targets neurotransmitters to alleviate symptoms. SSRIs work by increasing the level of serotonin, which is a neurotransmitter involved in mood regulation. Serotonin reduces symptoms of anxiety by stabilizing a person's mood and by reducing worry (Figure 3.5).

Key study

Murphy et al. (2021)

Murphy et al. (2021) reviewed research literature and found that while knowledge and understanding of how SSRIs *cause* anxiety to be reduced is incomplete, PET imaging studies demonstrate that therapeutic doses of SSRIs affect about 80 percent of brain serotonin transporters.

Research based on experiments suggests that SSRIs may help the brain adapt and change, a process known as synaptic plasticity. This can be seen through the growth of new neurons in the hippocampus, a brain area important for memory and mood regulation. Some studies show that SSRI treatment might increase the volume of the hippocampus.

fMRI studies show that SSRIs also affect the corticolimbic system, which is the brain network involved in processing and regulating emotions. These *changes* in emotional processing could be a key part of how SSRIs work to improve patients' mood and reduce their feelings of anxiety.

The environment also plays a significant role in how well SSRIs work. Patients who live in supportive social environments tend to respond better to SSRI treatment, showing that factors such as relationships and social support influence the effectiveness of SSRI medication.

Not only do SSRIs promote brain changes that may help with mood and anxiety disorders, but their effectiveness is also influenced by the individual's social environment. These insights highlight the importance of considering both biological and environmental factors in treatment.

Critical thinking

Murphy et al. (2021) is a recently published study, based on studies published since 2000, which means the findings may be more relevant to current behavior.

While PET imaging shows that SSRIs affect a significant portion of serotonin transporters, it is not clear if this translates to having a *causal* effect on anxiety disorder.

While experimental studies link SSRIs to synaptic plasticity and **neurogenesis**, it is not clear whether these neurobiological *changes* reduce anxiety symptoms or if they are outcomes of the treatment.

Environmental influences may affect anxiety disorder symptoms directly rather than the chemical effects of SSRIs.



▲
Figure 3.5 SSRIs are usually taken in tablet form on a daily basis.

Activity 87

Use the internet to find a diagram showing a simple representation of how SSRIs affect serotonin levels in the synaptic gap. Draw your own diagram in your notebook.

The effectiveness of one or more biological treatments for treating anxiety

SSRIs are generally considered effective for treating anxiety disorders. They are often recommended as a first treatment for GAD, panic disorder and OCD because they reduce the intensity and frequency of anxiety episodes, help individuals to feel more comfortable in social settings, and reduce the intensity and frequency of intrusive thoughts. SSRIs generally have a low risk of side effects.

Key study**Baldwin et al. (2011)**

Aim To determine the effectiveness of SSRIs as a treatment for anxiety disorder.

Method A literature search of electronic databases for the years 1980–2009 using a strategy that combined the term GAD with RCT (randomized controlled trial). The method also included treatment studies not identified through the search and attempted to identify recently completed treatment studies, available only as conference abstracts.

Findings Randomized placebo-controlled trials showed that about 40–60 percent of patients responded to placebo treatment and 60–75 percent responded to SSRIs.

Conclusion Randomized double-blind placebo-controlled trials provided evidence for the effectiveness of some SSRIs.

Critical thinking

As a research method, a literature review only synthesizes existing research, so this study does not generate new empirical insight.

Baldwin et al.'s (2011) literature search only considered research published up to 2009, and appears to have considered only literature published in English, limiting the contents of the study to English-speaking cultures.

Psychological treatment for one disorder (CBT and anxiety)

One psychological treatment of anxiety is CBT, which is widely recognized and empirically supported through research and clinical experience for various anxiety disorders. CBT is a structured, relatively short-term therapy that aims to identify and change negative thinking and behavior that contribute to anxiety (Figure 3.6). It assumes that people's thoughts, feelings and behavior are interrelated, so that by changing thoughts and maladaptive behaviors, anxiety symptoms can be alleviated.



Figure 3.6 CBT is a structured, relatively short-term therapy that aims to identify and change negative thinking and behavior that contribute to anxiety.

CBT typically involves helping the patient to recognize anxiety-related feelings and physiological reactions to anxiety, identify their thoughts related to their anxiety-provoking situations (for example, negative or unrealistic expectations) and then change the anxiety-provoking thought processes (for example, by testing predictions and modifying negative, worrying self-talk into positive, coping self-talk). A basic CBT procedure is exposure, which involves testing and facing anxieties in a gradually increasing rate of exposure. Behavioral training strategies such as role-playing are sometimes used to teach coping skills, such as relaxation techniques, social skills and problem-solving skills.

Questions remain about the mechanism of *change* within CBT (James et al., 2020). Restructured thinking, combined with exposure to anxiety-inducing situations, substantially reduces anxiety symptoms. More time spent on exposure has also been associated with effective outcomes, as has patients' development of coping strategies. Clinicians advise that a patient's ability and willingness to master CBT is a significant factor in its effectiveness.

The effectiveness of one or more psychological treatments for treating anxiety

Key study

James et al. (2020)

Since the last Cochrane Review (James et al., 2020), the number of studies evaluating the effectiveness of CBT for anxiety disorders increased from 41 to 88 and included three times the total number of participants. This substantial growth in research provides a more robust dataset to assess CBT's efficacy. The Cochrane Review found evidence indicating that CBT is significantly more effective than **wait-listing** or no treatment in achieving remission for all anxiety disorders in the short term. The remission rate for anxiety disorders was 49 percent for those receiving CBT, compared to 18 percent for wait-listing/no treatment controls. Clearly, CBT is highly effective as a treatment for anxiety disorders.

A Cochrane Review is a comprehensive review of primary research in human healthcare and is published in the Cochrane Database of Systematic Reviews.

The reviews are considered the gold standard in evidence-based healthcare. They analyze and synthesize existing studies to evaluate the effects of interventions for prevention, treatment and rehabilitation. Cochrane Reviews pool data from many studies to generate high-quality evidence that informs worldwide healthcare policies.



Critical thinking

The Cochrane Review (James et al., 2020) is a UK-based review of research and includes only English-language research studies.

The review was conducted relatively recently so its conclusion is relatively current.

The review does not contribute new research results to the body of knowledge on CBT and anxiety disorders.

Prevention and/or treatment for one or more health problems (obesity)

CBT is an effective treatment for obesity when included in a weight-loss program that includes changes to diet and physical activity. CBT helps people to address the cognitive, emotional and behavioral causes of obesity and so leads to sustainable weight-loss and improved overall health and well-being. CBT's focus on long-term behavior changes and psychological health makes it an effective treatment for obesity because it addresses the psychological and behavioral factors that result in weight-gain and the difficulties associated with weight maintenance.

CBT helps people to identify and change their unhealthy eating and activity behavior through strategies like self-monitoring, goal-setting and problem-solving, promoting healthier behaviors that lead to sustained, long-term and permanent weight-loss. The treatment also addresses emotional eating by helping people to recognize and manage the emotions that initiate overeating behavior, empowering people to recognize and respond to anxiety and stress in healthier ways. With this treatment, weight-loss tends to be slower compared to other interventions such as surgery or medication, but CBT's long-term benefits are significant, as it teaches skills that support sustained (permanent) weight reduction by addressing the root causes of overeating. Often combined with exercise, dieting and medications, CBT enhances weight-loss outcomes and improves self-efficacy, helping people to believe in their ability to maintain a healthy lifestyle. By addressing cognitive and emotional factors such as self-esteem, motivation and body image, CBT addresses the root causes of overeating and obesity. Research, including meta-analyses and clinical trials, consistently show that CBT is effective in treating obesity, leading to lasting weight-loss by equipping people with strategies to anticipate and manage emotions and situations that could lead to overeating.

Activity 88

Find and watch videos on the internet that show or describe CBT sessions with patients experiencing health issues such as obesity, and describe the general format of the CBT treatment.

Key study

Dolores Corbalán et al. (2009)

Aim The aim of Dolores Corbalán et al. (2009) was to assess the effectiveness of CBT combined with a Mediterranean diet as a treatment for obesity.

Participants 1406 obese subjects (BMI 31 ± 5 kg/m²), aged 20–65 years old, from an area on Spain's Mediterranean coast.

Methods Participants followed a Mediterranean diet (Figure 3.7) and attended CBT sessions for 34 weeks.



Figure 3.7 The Mediterranean diet is a healthy eating pattern that includes fresh fruit, vegetables, whole grains, legumes, nuts, olive oil, lean proteins like fish, and a moderate consumption of dairy products like Feta cheese, yogurt and red wine.

Results 89 percent of the participants fulfilled the Mediterranean diet principles and attended CBT sessions during the study. The mean weight loss was 7.7 kg.

Conclusions The combination of CBT and improved diet is effective for achieving weight-loss. Obesity patients should be encouraged to record their food intake in a journal and to attend regular group therapy sessions.

Critical thinking

The study was restricted to Spanish residents, so it is unclear if the conclusion can be generalized to people of other nationalities and cultures.

Some participants were not obese (with a BMI less than 30).

The study was conducted in 2009; it is not clear if the same results would be achieved now.

Class practical

Research method: Interview

An interview is a qualitative research method that involves a direct conversation between a researcher/interviewer and a participant to gain in-depth information on a topic. An interview allows the researcher to explore complex behaviors and experiences that cannot be readily quantified. Interviews reveal information about the relationship between two variables, such as high school students' social media use and their self-esteem, by creating an opportunity for participants to express their experiences, perceptions and feelings in some detail. By using structured and semi-structured interview questions, the researcher can identify patterns, correlations and possible *causal* links between social media use and self-esteem levels among high school students.

A one-to-one interview involves a private conversation between an interviewer and a single participant, which allows the participant to express their views without being influenced by others. This can generate personal insights into the interviewee's health and well-being.

A focus group interview involves a group discussion in which several participants participate in a discussion on a given topic. This encourages dialogue and shared experiences. Individual opinions can be affected by the group's dynamics.



Strengths and limitations of interviews

Strengths	Limitations
Allows for rich, detailed information on participants' experiences.	Conducting and transcribing interviews can take a lot of time.
Interviewers can adapt questions based on participant responses to gain clarification and deeper understanding.	Interviewer bias can affect participants' responses.
Establishes rapport, which can lead to more honest responses.	Participants may give responses that they consider socially acceptable rather than answering honestly
Interviewers can observe body language and tone to add to the context of the verbal responses.	A small sample size limits the generalizability of the findings.

Considerations when designing an interview

- Ensure questions are clear, simple and free of jargon.
- Consider the type of questions to use – open-ended, closed or a mix of question types based on research goals.

- Organize questions logically, starting with general questions and progressing to specific ones.
- Avoid leading questions that may influence the participant's response.
- Include relevant questions to gather basic demographic data such as age, gender and occupation, if appropriate to the study's aim.
- Ensure the interview is not too long, to avoid participant or interviewer fatigue.
- Clearly explain how data will be used and be sure the interviewee understands that they can withdraw at any time.
- Give clear instructions for completing the interview.

Issues of responsibility and ethical considerations

- Ensure participants understand the purpose of the research, the nature of the interview and their rights, including the right to withdraw at any point.
- Safeguard participants' privacy by ensuring responses are anonymized and stored securely.
- Given that interviews in health and well-being may explore sensitive topics, the interviewer must be sensitive to distress and be willing to provide support or refer participants to appropriate help if necessary.

Possible research questions to investigate using interviews in health and well-being

- 1 How do individuals perceive the effectiveness of mental health support in their school?
- 2 What are the main stressors that affect students' academic performance?
- 3 How do people cope with chronic health conditions?
- 4 How do people define well-being, and what factors contribute to their perception of well-being?
- 5 What role does physical activity play in managing stress or anxiety?
- 6 How do cultural factors affect perceptions of mental health?
- 7 What barriers are there to accessing mental healthcare services?
- 8 How do individuals describe the emotional impact of stress?
- 9 How do students perceive the importance of sleep and nutrition in their well-being?
- 10 What are the psychological effects of social media usage on self-esteem?

Class practical: example

Note: For the purpose of the class practical, each one-to-one interview will include one participant (hence the name). This is an example only. Teachers and students may create their own one-to-one interview or focus group.

Research proposal One-to-one interview with school health staff.

Aim The aim of this research is to explore how school health staff define well-being and identify the factors that contribute to their perception of well-being. The study seeks to gain insight into the experiences and perspectives of health staff to better understand how they view well-being in the context of their role and personal experience.

Method The study will employ a one-to-one semi-structured interview as the primary research method. This approach allows for in-depth exploration of personal definitions and perceptions, while also allowing the interviewer to probe for further clarification or additional details when necessary.

Ethical considerations

- **Informed consent:** The participant will receive detailed information about the research aim and procedures and how the data will be used. Written consent will be obtained before the interview.
- **Confidentiality:** The participant's identity and any identifying information will be anonymized in the final research report. All data will be securely stored.
- **Right to withdraw:** The participant will be informed that they can withdraw from the study at any point without any consequences.
- **Minimizing harm:** Care will be taken to avoid questions that could cause distress, and the participant will be given the opportunity to refuse to answer any question they are uncomfortable with.

Participant The participant will be a school health staff member (such as a school nurse or counselor) with at least one year of experience in their current role. This ensures that the participant has sufficient experience in the field to provide meaningful insights into their perception of well-being.

Selection method Purposive sampling will be used to select the participant. This method is appropriate because it allows for the intentional selection of a participant who is best positioned to provide relevant insights based on their role and experience in school health.

Procedure

- **Participant recruitment:** The school health staff member will be approached via email or in person. The study will be explained and participation requested. Once consent is obtained, a mutually convenient time and location for the interview will be arranged.
- **Interview setting:** The interview will be conducted in a quiet, private setting to ensure confidentiality and comfort for the participant.
- **Interview structure:** The interview will be semi-structured, allowing flexibility for the participant to elaborate on responses while maintaining focus on the key research questions.

Proposed open-ended interview questions

- 1 How do you personally define well-being?
- 2 What aspects of well-being are most important to you in your role as a school health staff member?
- 3 What do you think are the main factors that contribute to well-being in your own life?
- 4 How do you see your role contributing to the well-being of students and staff at the school?
- 5 Can you describe any challenges or barriers you encounter in promoting well-being in your role?

- 6 Do you think the school's environment or culture impacts your perception of well-being? How?
- 7 How do you balance your own well-being with the demands of your work?
- 8 In your experience, are there any specific programs or practices that support your sense of well-being at school?
- 9 How do you think student well-being differs from staff well-being, if at all?
- 10 What recommendations would you make for improving well-being in the school environment?

Data analysis method

Transcription The interview will be audio-recorded (with the participant's consent) and transcribed verbatim to ensure accuracy in capturing the participant's responses.

Thematic analysis A qualitative thematic analysis will be used to identify key themes and patterns in the responses. This process will involve coding the data and organizing it into themes that reflect the participant's definition of well-being and the factors they identify as contributing to it.

Interpretation The findings will be interpreted to explore how the participant's views on well-being align with or differ from existing literature and theories on well-being in health and educational settings.

This research will provide valuable insights into the perspectives of school health staff on well-being, contributing to a deeper understanding of how well-being is perceived in the school context and how it can be supported.

HL extensions

The role of culture in shaping human behavior in the context of health and well-being

Note: You should be able to discuss and explain how culture can affect health and well-being in some way. This is one example of how culture can have an effect on health and well-being. You are not required to learn this material for an examination.

Culture plays a significant role in understanding differences in human behavior in the context of health and well-being across populations. Psychologists study culture by looking at various layers: a person's local culture (the immediate societal norms and practices they are immersed in), the culture they are enculturated into (the broader traditions and values passed down from generation to generation) and global culture (the widespread influence of globalization on behaviors, beliefs and health practices).

Cultural diffusion, which refers to the spread of cultural beliefs and practices across different societies, raises important questions about how globalization affects both mental and physical health, personal identity and the quality of relationships. For example, global influences on dietary habits or beauty standards can impact both physical health (the rise in obesity or eating disorders, for instance) and mental well-being (such as self-esteem issues relating to body image).

In studying culture, researchers face challenges in operationalizing variables, meaning it can be difficult to define and measure cultural factors that influence health behaviors. One of the major risks in cultural research is the ecological fallacy, which is the assumption that every individual within a cultural group adheres to the general cultural norms. For instance, assuming that everyone in a collectivist culture prioritizes family and group harmony over personal well-being might overlook important individual differences in mental health outcomes.

Researcher bias is another significant issue in cultural studies, especially when studying health and well-being across different societies. One common form of bias is the imposed etic bias, where researchers apply their own cultural assumptions to another culture. This can lead to misguided conclusions, such as taking findings from one culture regarding mental health practices and assuming they apply universally. For example, imposing findings about stress management from a US or European context onto Malaysian culture, where there might be different coping mechanisms such as meditation or collectivist support systems, could lead to inaccurate or incomplete insights. This highlights the importance of considering the unique cultural context when researching health and well-being, and avoiding assumptions that may not hold true across diverse populations.

Key study

Cultural Influences on Emotion and Well-Being: Comparing South Korea and Canada

Aim To investigate whether positive emotions, which are central to well-being, are associated with relational harmony and social connection in South Korea, but with personal achievement and autonomy/independence in Canada.

Background Increasingly, research focuses on the significance of cultural influences on emotional well-being. The assumption that “positive emotions are universally beneficial” seems intuitive, but studies suggest differences in how emotions are experienced in different cultures. This study examines how cultural norms may affect the perception of positive emotions and their connection to general well-being in Canada and South Korea.

This study focuses on the cultural orientations of collectivism and individualism. In collectivist cultures such as South Korea, individuals are deeply integrated into social groups and they prioritize relationships and harmony. In individualist cultures such as Canada, self-reliance and personal success are valued and encouraged. These contrasting cultures shape not only behavior but also how emotions are interpreted.

By comparing emotional experiences in Canada and South Korea, this study aims to show the cultural foundation of well-being. In South Korea, emotions that promote relationships and group cohesion, such as calmness and compassion, may enhance well-being. In Canada, however, feelings associated with personal accomplishment, such as excitement and pride, may play a more significant role.

CONCEPT: Perspective

Perspective refers to the way people view themselves and their relationships with others, which varies across cultures. In “Western” cultures like Canada, people tend to focus on independence and personal achievement, while in “Eastern” cultures like South Korea, people prioritize interdependence, valuing social harmony and group well-being. These perspectives influence how emotions are experienced and understood in terms of health and well-being.

Participants 920 undergraduate students participated: 620 students from Yonsei University (312 men, 294 women, and 14 participants who did not disclose their gender) and 300 students from the University of Toronto (112 men, 182 women, and 6 participants who did not disclose their gender). All South Korean participants were native Korean speakers and the Canadian participants were native English speakers and of European descent.

Method The study used a questionnaire that was distributed during an introductory psychology course. The South Korean students completed the questionnaire during the class and the Canadian participants completed it in smaller groups of 8 to 12 people in a tutorial class setting.

Participants rated the frequency with which they experienced 25 different emotions on a 7-point scale - from “never” (1) to “very often” (7). The emotion list was written in Korean and translated and culturally adapted for the Canadian version to ensure equivalence in meaning. Examples included emotions tied to relational harmony, (for example, empathy and warmth) and personal achievement (for example, pride and excitement).

CONCEPT: Bias

In research, *bias* refers to any systematic error or distortion in data collection, analysis, or interpretation that results from researchers’ assumptions, the design of the study, or participants’ behaviors, leading to inaccurate or misleading outcomes.

The difference in administration methods might have introduced bias to this study because the Japanese respondents completed the survey in large class settings, while the American participants did so in smaller groups, which could influence the responses due to differences in social dynamics and pressure in these environments. A cultural bias may have been introduced through the questionnaire design because the list of emotions was first developed for the South Korean participants, and the Canadian version was based on that list. The emotions chosen may reflect South Korean cultural norms and emotional experiences more closely than Canadian ones, potentially skewing results. There may also be a response bias because the survey was part of the course requirements for Canadian students so they might have felt pressure to respond in a certain way to meet expectations, which could affect the accuracy of their responses.

Findings/results The findings supported the hypothesis. The South Korean participants reported positive emotions most often when associated with social connection. Canadian participants experienced positive emotions more frequently when linked to personal achievements. Additionally, Canadians reported a higher overall frequency of positive emotions compared to South Koreans, while South Koreans reported a higher proportion of emotions associated with relational contexts.

Source 1: Frequency of types of positive emotion

Canadian participants reported experiencing interpersonally disengaged emotions, for example, excitement and pride, with a mean frequency of 5.6 (SD = 1.0) on a 7-point scale. South Korean participants reported experiencing interpersonally engaged emotions (example, compassion, warmth) with a mean frequency of 5.2 (SD = 1.1) on the same scale.

Source 2: Proportion of relational versus independent emotions

In South Korea, 68 percent of the positive emotions reported by participants were associated with connection and social harmony, compared to 35 percent in Canada. Conversely, 65 percent of positive emotions reported by Canadian participants were related to independence and personal achievement, compared to 32 percent in South Korea.

Source 3: Overall positive emotion frequency

The Canadian participants reported experiencing positive emotions more often overall: mean score 5.4 (SD = 0.9), compared to South Korean participants, mean 4.9 (SD = 1.2).

Source 4: Negative emotion frequency

South Korean participants reported experiencing negative emotions with a mean frequency of 3.8 (SD = 1.3), often tied to relational concerns, such as guilt or worry about others. Canadian participants reported a slightly lower mean frequency of negative emotions, at 3.4 (SD = 1.1), often tied to personal failure or frustration.

Source 5: Correlation between emotion types and well-being

In South Korea, the correlation between interpersonally engaged emotions and self-reported well-being was $r = 0.72$, indicating a strong relationship. In Canada, the correlation between interpersonally disengaged emotions and self-reported well-being was $r = 0.67$, also demonstrating a significant, albeit weaker, relationship.

Conclusion The study demonstrates how cultural perspectives shape the experience and interpretation of emotions with respect to well-being. In South Korea, emotions relating to interpersonal harmony and social connection were fundamental to positive experiences, reflecting a cultural emphasis on collectivism. In Canada, emotions relating to personal success and independence were more obvious and aligned with individualist values. These findings emphasize the value of cultural context in understanding the relationship between emotion and well-being.

HL practice questions

1. Explain one issue that limits the interpretation of the data in Source 1.
2. Analyze the findings and state a conclusion linked to the claim that culture can shape human behavior in the context of health and well-being.
3. Discuss how the researcher could improve the credibility of the findings in Source 3.
4. To what extent can we conclude culture may have a positive effect on mental health? In your answer, use your own knowledge and at least three of Sources 1–5.

The role of motivation in shaping human behavior in the context of health and well-being

Note: You should be able to discuss and explain how motivation can affect health and well-being in some way. This is one example of how motivation can have an effect on health and well-being. You are not required to learn this material for an examination.

Motivation is a key driving force that influences behavior. It shapes human actions, both consciously and unconsciously, and plays a significant role in promoting health and well-being. Motivation in this context can be divided into primary and secondary motives.

Primary motives, such as hunger, thirst and the need for sleep, are essential for maintaining physical health. These basic needs can be measured through physiological tests, such as checking glucose levels to assess motivation to eat, especially in individuals with eating disorders. In terms of well-being, addressing these primary motives ensures that the body's fundamental requirements are met, supporting overall health.

Secondary motives are more complex and relate to desires such as social affiliation, competition and personal health goals. In the health and well-being context, secondary motives may include goals such as achieving fitness, reducing stress or improving mental well-being. These motives are often assessed by asking individuals directly about their health-related behaviors, though self-reported data can be influenced by biases, such as the desire to provide socially acceptable responses.

CONCEPT: Causality

The concept of *causality* is evident in the relationship between motivation and health-related behaviors, where primary motives like hunger or thirst directly cause actions necessary to maintain physical health. Similarly, secondary motives, such as social affiliation or personal health goals, can lead to behaviors aimed at improving well-being, demonstrating how motivation serves as a causal factor influencing both physical and mental health outcomes. Understanding these causal links is essential for designing interventions that address both primary and secondary motives to promote overall health and well-being.

Motivation can be further categorized into intrinsic and extrinsic forms, both of which significantly impact health and well-being. Intrinsic motivation arises from within and is driven by personal satisfaction or a genuine interest in maintaining or improving health. For instance, someone may engage in regular physical exercise because it makes them feel good and enhances their sense of well-being. On the other hand, extrinsic motivation is driven by external factors, such as rewards or punishments, which can also influence health behaviors. For example, people might adopt healthier habits to receive praise, avoid criticism or achieve a specific health target such as weight-loss. Experiments often test the effects of external motivators on behavior to understand how these influences shape health-related decisions.

Self-determination theory offers insights into intrinsic motivation by suggesting that individuals have natural tendencies toward personal growth and the fulfilment of basic psychological needs, such as autonomy, competence and relatedness. When these needs are met, people are more likely to make health choices based on personal interest and motivation, rather than external pressures. This is particularly relevant for long-term health and well-being, as intrinsically motivated individuals tend to sustain healthier behaviors over time.

Understanding motivation is important for examining how it relates to causality and change in the health and well-being context. Research has shown that intrinsic motivation, especially in health-related activities like exercise, leads to lasting improvements in both physical and mental health. Motivation is a powerful tool in promoting positive changes in health behaviors, resulting in enhanced well-being and overall quality of life.

Key study

Lemieux et al. (2012)

Aim Lemieux et al. (2012) aimed to explore the health and well-being motivations of visitors to two protected wilderness areas in Canada.

Participants 166 park visitors were selected using a convenience sampling method, targeting adults visiting the protected areas during October 2011. Respondents were selected based on availability at locations such as campsites, trails and displays, and participation was voluntary and anonymous.

Method The study used a survey to systematically understand why people visit parks for their health and well-being and determine the benefits they gain from these visits. The survey was conducted using iPads® and analyzed using IBM SPSS® Statistics. The survey also gathered demographic information, including gender, residence, age, income and education level, as well as details about the visit, such as length of stay, group type (single, family, etc.) and activities (hiking, camping, canoeing, etc.).

Findings/results The key findings were that visitors primarily identified psychological, emotional and social well-being improvements as the main reasons for their visits. The overall experience was viewed as highly positive, with psychological, social, cultural and environmental benefits being the most significant. Additionally, park visits were seen as particularly beneficial for child development, especially in terms of physical, social and cognitive growth. Women perceived these benefits more strongly than men. The study suggests that social capital should be considered in conservation policies, along with ecological factors, though more research is needed to confirm these findings.

Visitor motivations were measured using a 10-item scale, assessing reasons for visiting the park (for example, physical well-being for activities such as hiking, and psychological well-being for relaxation). Responses were rated on a 5-point scale from “not at all important” to “very important”. Well-being benefits from the visits were assessed using a 7-point scale, with options ranging from “greatly worsened” to “greatly improved”. The perceived benefits for child development were also measured on a 7-point scale, from “strongly disagree” to “strongly agree”.

The survey collected 166 responses (57 from Gatineau and 109 from Pinery). The sample was slightly male-dominated (55 percent), with an average age of 43. Most respondents were highly educated (61 percent with a university degree), 47 percent were visiting with children and 85 percent were employed.

Source 1 (Table 3.5) shows the perceived importance of health and well-being indicators related to respondents’ motivations for visiting protected areas (percent of respondents) (n = 166).

Health and Well-being: Attribute and Description	Not At All Important	Of Little Importance	Moderately Important	Important	Very Important
Physical Well-being (for physical activity like hiking, bicycling, swimming, canoeing)	1.9%	5.0%	22.5%	35.0%	35.6%
Psychological/Emotional Well-being (for restoration from mental fatigue, relaxation, solitude & quiet)	1.3%	3.1%	16.9%	36.9%	41.9%
Social Well-being (for opportunity for increased social interaction/bonding with family, friends)	1.2%	6.8%	14.3%	34.8%	42.9%
Intellectual Well-being (for opportunity to engage in creative and stimulating activities)	3.8%	15.6%	30.6%	30.6%	19.4%
Spiritual Well-being (to connect with nature, inspiration of nature, seek meaning/purpose of life)	7.7%	10.3%	21.8%	31.4%	28.8%
Ecological Well-being (to experience the natural environment, sense of ecological citizenship)	2.6%	6.4%	21.8%	35.3%	34.0%
Environmental Well-being (to experience sense of place, outdoors, desirable weather conditions)	2.6%	11.5%	25.0%	35.9%	25.0%
Cultural Well-being (to experience cultural and historical heritage)	0.6%	17.9%	18.6%	32.7%	30.1%
Occupational Well-being (to improve my ability to work after my visit)	17.5%	26.6%	22.7%	25.3%	7.8%
Economic Well-being (to support local economy)	20.6%	30.3%	27.1%	14.2%	7.7%
Mean	6.0%	13.4%	22.1%	31.2%	27.3%

Table 3.5 Source 1.

Source 2 (Table 3.6) shows descriptive statistic and tests of significance for the importance of ratings of health and well-being motivations of visitors for visiting the protected areas (n = 166).

	Descriptive		Tests of Significance p-values			
	Mean	SD	Age ¹	Sex ²	Income ¹	Education ²
Physical Well-being	3.98	.98	.235	.055	.397	.096
Psychological Well-being	4.15	.90	.681	.002	.004	.307
Social Well-being	4.11	.97	.952	.080	.463	.719
Intellectual Well-being	3.46	1.09	.602	.499	.101	.370
Spiritual Well-being	3.63	1.22	.265	.016	.096	.576
Ecological Well-being	3.92	1.02	.286	.372	.153	.719
Cultural Well-being	3.74	1.10	.110	.296	.064	.783
Environmental Well-being	3.69	1.05	.563	.341	.034	.207
Occupational Well-being	2.79	1.22	.314	.364	.113	.641
Economic Well-being	2.58	1.19	.539	.088	.121	.036

¹ p-values associated with one-way ANOVA of mean rating by age and income categories

² p-values associated with t-tests of mean rating by dichotomous variables sex and education

Table 3.6 Source 2.

When looking at different demographic factors, age did not have any major impact on how people ranked their motivations for visiting the park. In other words, age did not change why someone might visit a park for health and well-being reasons. However, there were some differences in how important certain motivations were: women tended to rate psychological and spiritual reasons higher, while people with higher education rated economic reasons lower. Additionally, those with the highest incomes rated psychological motivations lower, and people with the lowest incomes gave more importance to environmental reasons.

The findings have important implications for park management. First, the results suggest that health and well-being benefits are a major reason people choose to visit parks, which supports findings from studies on suburban parks. Second, the study showed that 72 percent of visitors reported an improvement in their health and well-being from their park visit, while only 0.6 percent said they felt worse. The most significant improvements were in psychological, emotional, environmental, social and physical well-being.

CONCEPT: Change

In this context of health and well-being, *change* refers to the process through which individuals modify their behaviors, habits or mindset to improve their physical, mental or emotional state over time. Lemieux et al. (2012) show that park visits lead to positive changes in various aspects of well-being, such as psychological, emotional, social and physical health, with 72 percent of visitors reporting improvements. Additionally, the data shows that different demographic factors, such as gender and income level, result in changes in the motivations for visiting parks. This suggests that individuals' priorities and the reasons behind their behaviors shift based on factors such as socioeconomic status. This illustrates how external circumstances contribute to changes in health-related behavior.

Source 3 (Table 3.7) shows visitor perception of various statements associated with nature, protected areas and human health and well-being (percent of respondents) (n = 166):

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
Contact with nature improves the quality of life of Canadians.	0.0%	0.0%	0.6%	3.8%	8.8%	30.8%	56.0%
The health and well-being benefits associated with experiencing nature should be reported alongside other health indicators in Canada.	0.0%	0.6%	1.2%	3.7%	9.3%	31.7%	53.4%
Having nature in close proximity, or just knowing it exists, is important to people regardless of whether they are regular users of it.	0.0%	0.0%	0.0%	3.2%	10.8%	28.5%	57.6%
Government agencies should develop education, interpretation, and outreach messaging that communicate the health and well-being benefits of protected areas.	0.7%	0.0%	0.0%	5.3%	11.3%	28.5%	54.3%

Table 3.7 Source 3.

HL practice questions

- 1 Explain one issue that limits the interpretation of the data in Source 1.
- 2 Analyse the findings from Source 2 and state a conclusion linked to the claim that motivation to visit protected areas may have a positive effect on the mental health of people of all ages.
- 3 Choose **one** of the following:
 - i. Discuss how the researcher could improve the credibility of the findings.
 - ii. Discuss how the researcher could avoid bias.
 - iii. To what extent are the findings transferable to other populations or contexts?
- 4 To what extent can we conclude that motivation may have a positive effect on the mental health of visitors to protected areas in Canada? In your answer, use your own knowledge and at least two of Sources 1–3.

The role of technology in shaping human behavior in the context of health and well-being

Note: You should be able to discuss and explain how technology can affect health and well-being in some way. This is one example of how technology can have an effect on health and well-being. You are not required to learn this material for an examination.

The increased use of technology – including mobile phones, computers, video games and AI – has had a profound impact on health and well-being. This influence extends to various aspects of human behavior, including social relationships, mental health and overall well-being. While technology has brought many benefits, such as improved access to healthcare information, telemedicine and support networks, concerns have been raised about its effects on mental and physical health, particularly relating to excessive use.

One of the key challenges in studying the effects of technology on health and well-being is the difficulty in isolating variables in natural settings. For instance, when analyzing the impact of social media on mental health, it is hard to separate the specific effects of social media use from other factors such as pre-existing mental health conditions, social support systems or individual personality traits. This makes it challenging to draw clear conclusions about the direct impact of technology on well-being.

Furthermore, research on technology and its influence on health often encounters sampling biases, which may limit the generalizability of findings. For example, studies that rely on self-reported data from specific groups, such as college students or active social media users, may not accurately reflect the experiences of other populations, such as older adults or individuals with limited access to technology. This lack of diverse sampling can skew the results, making it difficult to understand the broader implications of technology use on health and well-being across different demographics.

Much of the research in this area is correlational, meaning that while there may be a relationship between technology use and health outcomes, it is difficult to determine the direction of the relationship. For instance, excessive use of technology may contribute to increased anxiety or depression, but it is equally possible that individuals who are already experiencing anxiety or depression are more likely to engage in excessive technology use. This issue of bidirectional ambiguity complicates the interpretation of research findings and makes it difficult to identify causal relationships between technology and well-being.

Researcher bias and confirmation bias also pose significant challenges in this field, especially in action research conducted in settings such as schools. For example, researchers may unconsciously seek to confirm their preconceived notions about the negative effects of technology on students' mental health, leading to biased interpretations of data. This bias can be further exacerbated by the funding sources for research on technology, as studies sponsored by tech companies may be more likely to highlight the positive effects of technology use, while those funded by health organizations may focus on potential harms.

The relatively new nature of this research area in psychology also raises concerns about publication bias. Studies that report significant or novel findings, especially those suggesting a strong link between technology use and mental health issues, are more likely to be published, while studies with null or less striking results may be overlooked. This can create a skewed perception of the overall impact of technology on health and well-being, as the full range of findings is not always represented in the literature.

Moreover, the replication crisis in psychology – whereby many studies fail to be replicated – further complicates research on technology's impact on health. Findings from various studies on the influence of technology have not been consistently replicated, casting doubt on the reliability of some conclusions. As a result, it is important for research to prioritize replication and methodological rigor to better understand the true effects of technology on health and well-being.

While the increased use of technology has undoubtedly shaped human behavior and relationships, understanding its true impact on health and well-being remains a complex task. Researchers must navigate challenges such as sampling bias, bidirectional ambiguity and researcher bias, while also addressing issues of publication bias and replication. As technology continues to evolve, it will be essential for psychological research to adapt and provide evidence-based insights into how technology use affects health and well-being across diverse populations.

Key study

Tanja-Dijkstra (2011)

Aim To gain insight into the effects of the visibility of medical equipment on the well-being of patients.

Background When people are in healthcare environments such as hospital rooms, they often feel stressed and anxious. Seeing wires, tubes and monitors next to the bed can add to these feelings. To help with this, one of the newer ideas in healthcare design is to organize patient room headwalls to reduce clutter and hide medical equipment from view. However, there have not yet been any experimental studies to determine how hiding this equipment might affect patients' stress levels.

Source 1 (Table 3.8) shows Tanja-Dijkstra's hypotheses.

Hypotheses	
H1	Placing medical equipment out of sight leads to reduced feelings of stress.
H2	Feelings of pleasure mediate the relationship between the visibility of medical equipment and stress.
H3	The visibility of medical equipment leads to patients having more trust in healthcare providers.



Table 3.8 Source 1.

Method The experiment used a between-subjects design, meaning participants were divided into two groups. One group saw a picture of a hospital room with medical equipment visible, while the other saw a picture of a room where the equipment was hidden. This method has been found to accurately simulate real-life environments.

Participants A total of 42 participants (24 females and 18 males) took part in the study. The participants' average age was 21.3 years (plus or minus 2.2 years). They received either course credit or €2 for their participation. The study was approved by the Ethics Committee of the University of Twente's (Netherlands) Faculty of Behavioral Sciences.

CONCEPT: Responsibility

Being *responsible* in research means conducting studies ethically, ensuring the well-being and informed consent of participants, maintaining integrity in data collection and reporting, and respecting the rights and confidentiality of all involved. Tanja-Dijkstra (2011) appears to be ethical, as it was approved by the Ethics Committee and participants gave informed consent. Offering rewards like money or course credits is generally acceptable in psychological studies, as long as the incentives do not unduly influence or pressure individuals to participate.

Procedure When participants arrived at the lab, they were placed in separate rooms with computers that provided instructions. They were asked to imagine being hospitalized with appendicitis. The scenario explained that they had undergone successful surgery but needed to stay in the hospital for three more days. Participants were then randomly shown a picture of a hospital room, either with visible medical equipment or with the equipment out of sight. After seeing the images, participants completed questionnaires measuring their stress levels, emotional state, trust in the healthcare provider, and how attractive they found the hospital room.

Findings/results

Source 2 (Table 3.9) shows Tanja-Dijkstra's findings.

Hypothesis	Findings
H1	Attractiveness An analysis of variance (ANOVA) showed that participants in both conditions rated the room as being equally attractive.
H2	Stress An ANOVA was performed to test the hypothesis. Participants in the room with the equipment placed out of sight experienced less stress, with a mean of 1.9 and a standard deviation of .59. Those in the room with the medical equipment visible had a mean of 2.4 and a standard deviation of .76.
H3	An ANOVA was performed and it disconfirmed the third hypothesis. Participants in the room with the equipment placed out of sight had more trust in the healthcare provider (mean of 3.9 and a standard deviation of .55) than those in the room with the medical equipment visible (mean 3.5, standard deviation 6).



Table 3.9 Source 2.

CONCEPT: Measurement

ANOVA means analysis of variance (or spread) of data. It is a statistical method used to compare the means of groups to determine if there are significant differences between the groups. ANOVA *measures* the variance within groups and between groups to determine whether the differences in means are the result of actual differences between groups or if they could have occurred by random chance.

This study explored how the visibility of medical equipment affects patients' well-being. The first hypothesis – that keeping medical equipment out of sight would reduce stress and impatience – was supported by the experiment. The results also showed that this stress reduction was linked to feelings of pleasure: when the equipment was hidden, participants experienced a more positive emotional state, which in turn lowered stress and impatience. However, the third hypothesis was not supported. Contrary to expectations, having medical equipment visible did not increase patients' trust in healthcare providers. In fact, hiding the equipment increased trust in the healthcare provider.

Source 3 (Figure 3.11) shows a mediation model with pleasure as mediator:

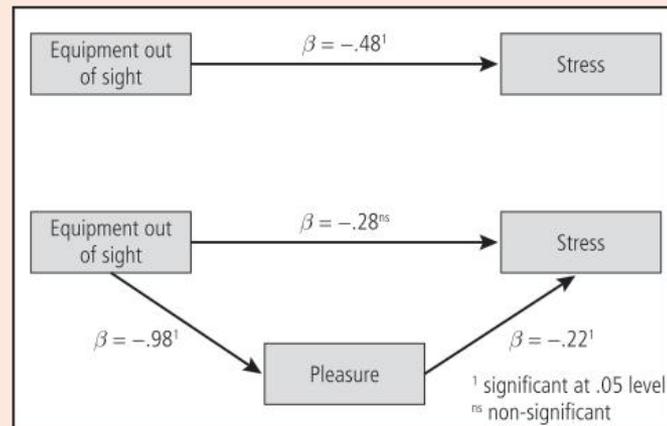


Figure 3.11 Source 3.

The findings suggest that designing patient rooms with medical equipment placed out of sight can have positive effects on patients' well-being. However, it is also important to consider the needs of healthcare staff when designing these rooms. The design should not interfere with the functionality or accessibility of medical equipment for the staff. Before implementing changes, research on prototypes should be conducted to evaluate how easy and efficient the design is for medical staff to use.

Conclusion This study offers some initial insights into how the visibility of medical equipment impacts patient well-being. The results showed that seeing medical equipment increases patient stress, while hiding it can reduce stress by creating a more positive emotional state. Additionally, keeping medical equipment out of sight also led to a higher level of trust in the healthcare provider. This suggests that the design of hospital rooms can play a role in improving patients' emotional well-being and overall experience.

HL practice questions

- 1 Explain one issue that limits the interpretation of the data in Source 1.
- 2 Analyze the findings from Source 2 and state a conclusion linked to the claim that the use of technology in health and well-being may have a negative effect on the well-being of patients.
- 3 Choose **one** of the following:
 - i. Discuss how the researcher could improve the credibility of the findings.
 - ii. Discuss how the researcher could avoid bias.
 - iii. To what extent are the findings transferable to other populations or contexts?
- 4 To what extent can we conclude that the use of technology may have a negative effect on the health and well-being of patients? In your answer, use your own knowledge and at least two of Sources 1–3.

[End of HL extension section]

Context: Health and well-being

Concept–Context practice questions

Bias

- 1 How might researcher bias influence the outcomes of studies on mental health treatments, such as SSRIs for anxiety disorders, and what methods can be used to reduce this bias?
- 2 In what ways could cultural bias affect the diagnosis and prevalence rates of mental health disorders such as anxiety in different societies?
- 3 Explain how sampling bias might affect research conclusions about the effectiveness of CBT in treating obesity.
- 4 How can cognitive biases, such as anchoring and availability bias, affect a patient's decision-making regarding treatments for mental health disorders?
- 5 Discuss the role of publication bias in shaping public perceptions of the effectiveness of mental health treatments, such as for depression or anxiety.

Causality

- 1 How can the interplay of biological, cognitive and environmental factors complicate the establishment of a causal relationship between chronic stress and the development of anxiety disorders?
- 2 What role does bidirectional ambiguity play in the relationship between social isolation and depression, and how can researchers control for it in health studies?
- 3 To what extent can reductionism in biological models of obesity help or hinder our understanding of the root causes of obesity in different populations?
- 4 How do internal and external validity concerns affect the generalization of research findings on the effectiveness of CBT for treating GAD across different cultures?
- 5 In what ways might extraneous variables complicate the study of causality between smartphone use and mental well-being, and what control methods can be implemented to isolate causal factors?

Change

- 1 How can interventions such as CBT promote gradual behavioral change in individuals with anxiety disorders, and what role does intrinsic motivation play in maintaining those changes?
- 2 In what ways do biological and environmental determinism limit an individual's free will in overcoming obesity, and how can health interventions effectively challenge these limitations?
- 3 What are the barriers to change when addressing the relationship between chronic stress and physical health, and how can effective prevention strategies overcome resistance to change in individuals?
- 4 How does the concept of agency influence the process of behavioral change in people trying to manage social anxiety, and to what extent is change deliberate versus unplanned in such cases?
- 5 To what extent do unplanned life events, such as the onset of a chronic illness, trigger sudden changes in mental well-being, and how can health systems adapt to support these sudden shifts?

Measurement

- 1 How can different types of data (quantitative, qualitative and anecdotal) be used to measure the effectiveness of CBT in reducing anxiety symptoms? What challenges might arise when using self-reported data to assess changes in mental health?
- 2 Explain how the operationalization of variables is essential when studying the relationship between serotonin levels (a biological factor) and anxiety disorders. How would you triangulate methods, such as brain imaging and self-reports, to gain a comprehensive understanding of the disorder?
- 3 In what ways could measurement techniques, such as BMI, be both helpful and limiting in assessing obesity? How might cultural factors influence the interpretation of such measurements in different populations?
- 4 Discuss the role of longitudinal research designs in studying the development of anxiety disorders over time. How can these designs help to establish the impact of environmental stressors, such as chronic work stress, on both physical and mental health?
- 5 How can mixed-methods research (combining qualitative and quantitative data) be employed to evaluate the effectiveness of SSRI treatments for anxiety, and what measurement challenges arise when comparing biological data (for example, neurotransmitter levels) with subjective reports of well-being?

Perspective

- 1 How do biological, cognitive and sociocultural perspectives explain the etiology and treatment of anxiety disorders such as GAD? In what ways does combining these perspectives offer a more holistic approach to understanding mental health?
- 2 Discuss how an emic and etic approach might influence the treatment of anxiety disorders in different cultural settings. How could a psychologist incorporate both perspectives when designing treatment for anxiety in patients from diverse backgrounds?
- 3 To what extent can the sociocultural perspective explain the differences in how mental health is perceived and treated across different cultures? Consider how cultural norms might impact the acceptance of biological treatments for disorders such as depression.
- 4 In what ways do cognitive models, such as CBT, offer alternative explanations to biological models in the treatment of mental health disorders? How do both approaches contribute to a multi-perspective understanding of well-being?
- 5 How can deductive and inductive research methods be used to explore the relationship between mental health conditions, such as anxiety, and well-being across different cultures? What are the strengths and limitations of each methodology in this context?

Responsibility

- 1 To what extent does the use of informed consent and protection from harm in research on anxiety disorders align with social responsibility in psychology? How might these ethical principles impact the well-being of participants?
- 2 When investigating mental health disorders such as PTSD or eating disorders, how can psychologists balance the cost–benefit analysis of using potentially distressing methods while maintaining ethical responsibility and promoting participant well-being?

- 3 Discuss how the ethical responsibility of reducing stigma, particularly in relation to anxiety disorders, can influence both the public's understanding of mental health and the well-being of individuals diagnosed with these disorders. How can psychologists advocate for better governmental policies based on their research findings?
- 4 In the context of animal research on the biological explanations of mental health disorders, how should researchers refine and replace animal models to uphold ethical standards and contribute to better human health and well-being outcomes?
- 5 How might the ethical considerations of anonymity and the right to withdraw affect the validity of self-reported data in research on mental health and well-being? What are the implications of these ethical practices for advancing treatments such as CBT for anxiety disorders?

Human development

Introduction to human development

Human development is the broad process of growth and maturation across various aspects of a person's life, including physical, cognitive, emotional and social dimensions. Development includes *measurable changes* in physical size and capabilities, and also the acquisition of knowledge, abilities and behaviors that occur in a person's lifespan.

Human growth refers to the physical aspects of development, such as changes in height and weight. Growth is a significant aspect of development, but focusing solely on physical changes does not capture the qualitative nature of development, which includes psychological, emotional and social aspects.

Human development is the holistic progression and evolution of people over time and encompasses both quantitative aspects (physical growth) and qualitative aspects (skills, abilities and behaviors).

You should have an understanding of one or more of the following: cognitive, social, moral or language development.



Conceptual question

How do qualitative aspects of development such as emotional and social *change* contribute to the overall understanding of human development?

Models of development

Area of study	Learning objectives
Brain development	<p>The role of brain maturation in human development.</p> <p>The extent to which critical periods explain human development.</p> <p>The role of neuroplasticity in human development.</p>
Sociocultural factors in development	The influence of sociocultural factors in human development.
Stage theories and continuous models	The effectiveness of stage theories and continuous models in understanding human development.
Theory of mind	The role theory of mind has in understanding human development and cognition.

Do models in psychology help our understanding of behavior or do they over-simplify and so hinder our understanding?



Table 3.10 Models of development learning objectives from Subject Guide, pages 29–30.

Critical thinking

In what ways can models of development, such as cognitive and social models, be applied to real-life scenarios in education or parenting?

Brain development

Brain maturation is the process that occurs during a person's physical development. During brain maturation the brain develops and refines its neural connections to optimize cognitive efficiency. By the age of 5, the human brain is about 90 percent developed, with significant growth in synapse formation occurring in early childhood. Full maturation, especially of the prefrontal cortex, which is responsible for higher-level cognitive functions, continues until around age 25.

Critical thinking

What are the potential social or psychological impacts of delayed brain maturation during adolescence on decision-making and impulse control?

Neurons and **glial cells** are essential components of the nervous system and they are involved in process of brain maturation (Figures 3.13 and 3.14). Neurons are the primary signaling cells of the nervous system and are responsible for receiving, processing and transmitting information through electrical and chemical signals (Figure 3.12). They have a complex structure that includes a cell body (soma), dendrites (which receive signals) and an axon (which sends signals). The axon often ends in synaptic terminals that release neurotransmitters to communicate with other neurons. Neurons generate action potentials (electrical impulses) that travel along the axon to transmit information rapidly over long distances.

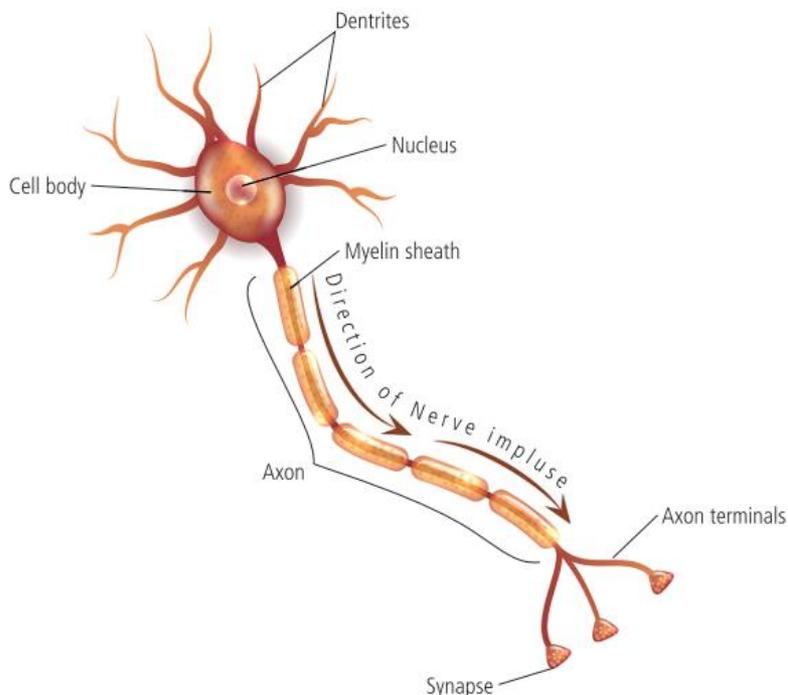


Figure 3.12 A neuron.

Glial cells, or glia, provide support and protection for neurons. They play a variety of roles, including maintaining homeostasis, forming myelin, providing support and nutrients, and participating in signal transmission in the nervous system. Glial cells are generally smaller than neurons and do not have complex structures like dendrites and axons.

Myelogenesis is the formation of myelin, which is layered around axons and insulates the nerve fibers from interference and so speeds up electrical signals. Myelination improves communication between neurons and enhances learning and memory.

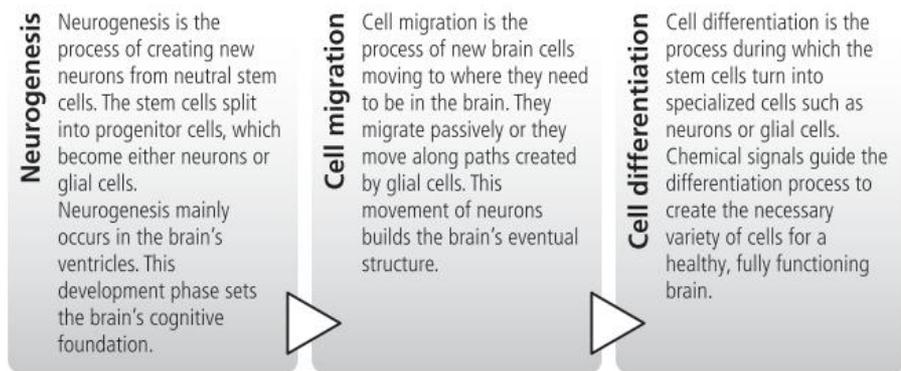


Figure 3.13 The process of brain maturation: neurogenesis, cell migration and cell differentiation.

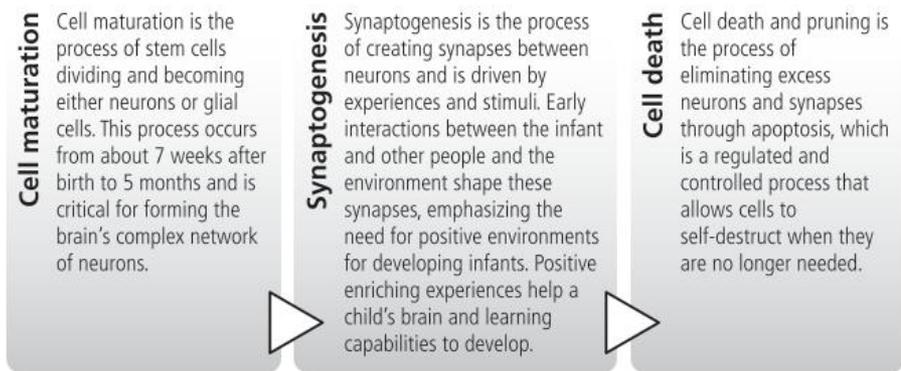


Figure 3.14 The process of brain maturation: cell maturation, synaptogenesis and cell death.

Critical thinking

How does brain maturation contribute to an individual's ability to make complex decisions, and what implications does this have for adolescent behavior?

Key study

Johnson (2001)

Aim To review the current understanding of human brain development and to provide an overview of the most significant developmental stages from prenatal to adolescence.

Method A literature review of peer-reviewed articles of longitudinal studies, cross-sectional studies, neuroimaging research and neurophysiological studies that used MRI, fMRI, electroencephalograms (EEG) and histological studies as evidence. The participants were humans in the prenatal to adolescence stages, and the studies typically involved large cohorts.

Results Johnson (2001) showed the following results.

- The brain continues developing after birth, to the extent that experience affects neural growth. Brain volume and cognitive function increase significantly in a child's first 1–2 years.
- Most neurons are present at birth, but synaptogenesis (the creation of synapses between neurons to facilitate communication between neurons) occurs rapidly during a child's first year, with synapse numbers reaching about 150 percent of adult levels. Brain activity patterns evolve, and most myelination happens, after birth, with different brain locations maturing at different times.
- Young children struggle with some cognitive tasks, such as reaching for hidden objects or detecting changes behind surfaces. While some abilities mature early on, full visual processing only develops by year 2. Young children are naturally drawn to faces, which helps social development.
- Three theories explain functional brain development: the maturational *perspective*, where cognitive abilities emerge as cortical areas mature; the interactive specialization approach, where abilities develop through the interactions of cortical networks; and the skill-learning hypothesis, where specific regions are active during skill acquisition in infants, with other regions taking over once skills are learned. There is evidence to support all three theories.
- Brain development relies on experience, neural activity and brain maturation.

Conclusions Johnson's (2001) literature review supports the five-stage model of brain maturation.

- During Stage 1, known as the Prenatal Development stage, one of the key processes is neurogenesis, during which neurons are created from neural stem cells. Cell migration follows. This involves neurons moving to specific locations in the developing brain. Then cell differentiation occurs, resulting in specialized neurons and glial cells. Research methods during the Prenatal Development stage rely mainly on histological studies and neuroimaging techniques to observe these intricate processes. Findings from these studies show rapid production and movement of cells, contributing to the formation of fundamental brain structures critical for future cognitive functions.
- During Stage 2, the Early Postnatal Development stage, important developmental processes include synaptogenesis. At the same time, the process of myelogenesis is occurring. This means myelin sheaths begin to wrap around the axons. This improves the transmission process between neurons. Researchers use longitudinal neuroimaging and EEG studies to study these processes.
- In Stage 3, the Infancy and Early Childhood stage, the main developmental process is neural pruning. This means excess or unnecessary neurons and synapses are destroyed to streamline neural networks. At the same time, the brain's regions differentiate themselves to specialize in specific cognitive functions. Researchers use fMRI and behavioral studies to study how neural pathways are refined and neural processing efficiency is increased in this developmental period.

- During Stage 4, known as the Middle Childhood stage, the processes of synaptogenesis and neural pruning continue, to enhance the specificity and efficiency of neural circuits. At the same time, there is a significant development in the child's complex cognitive and motor skills. Researchers use neuroimaging techniques and cognitive testing to these developmental changes.
- In Stage 5, known as the Adolescence stage, the final stages of brain maturation begin to occur in the prefrontal cortex, which is responsible for overall functions such as decision-making and impulse control. Also in this phase, myelination of the frontal and temporal lobes occurs, and this improves the speed and efficiency of neural transmission and communication. Researchers use longitudinal MRI studies and psychological assessments to investigate these processes in detail. It is commonly accepted that this phase continues until the mid-20s.

Critical thinking

While many researchers support the five-stage model described above, others have argued in favor of a seven-stage maturation process: neurogenesis, cell migration, cell differentiation, cell maturation, synaptogenesis, cell death and pruning, and myelogenesis.

It is unclear whether the participants included in the literature review represent a broad cultural base or come from Western, upper-socioeconomic segments of the population. This raises questions about the diversity and representativeness of the study samples and the potential impact on the generalizability of the findings.

There appears to be a *bias* in the literature review as many of the brain scans were conducted on patients or participants experiencing health issues, thus potentially limiting the generalizability of findings to the wider, healthy population.

To what extent could literature reviews and meta-analyses be considered unethical, given that participants in the original studies did not consent to their data being used in subsequent analyses?

TOK

Activity 89

Interview 3–5 peers aged 16–19 about whether they feel their brain and ways of thinking are mature like an adult's. Then, interview a similar number of individuals in their mid- to late-20s and ask if they feel they think more maturely now compared to their teenage years. Summarize your findings and share with the class to discuss how perceptions of brain maturity change with age and personal experiences.

The term **critical periods** refers to periods of time during which a person is especially sensitive to environmental stimuli or experiences.

These periods are significant for the development of some skills, behaviors or physiological systems; for example, there is a critical period in early childhood when the brain is very receptive to language input, and children who are not exposed to language in this critical period may face challenges in developing language skills. There are also critical periods during infancy and early childhood when visual experiences are necessary for visual pathways to develop.

Critical periods stress the significance of experiences and environmental influences in human development. They emphasize the idea that timing is important in the acquisition of certain skills and abilities.

Critical thinking

To what extent are critical periods in development fixed, and how do exceptions to these periods (such as later language acquisition) challenge the concept of rigid windows for development?

Attachment theory 1950s–60s

John Bowlby is known for his work in critical periods as they relate to social development. His research focused on the formation of attachment bonds during critical periods in infancy and early childhood. Bowlby proposed that children are physiologically predisposed to form emotional bonds with caregivers for survival and protection (Figure 3.15).



Figure 3.15 Bowlby described attachment as a deep and enduring emotional bond between an infant and their primary caregiver, usually the mother.

Bowlby proposed a critical period, from birth to about 2–3 years, during which children are most able to form secure attachments. He argued that in this critical period, consistent and responsive caregiving is required for the child's emotional and social development. Children who experience responsive caregiving in this period are more likely to develop a secure attachment style resulting in trust, exploration and positive relationships later in life.

Bowlby's research showed that disruptions to, or inadequate, care during the critical period from birth to 2–3 years can lead to attachment insecurities, such as avoidant or anxious attachment styles. His research showed that children who do not form secure attachments during this critical period tend to struggle with emotional regulation, interpersonal relationships and behavioral problems later in life.

This research has significant implications for clinicians, for child rearing and childcare policies and for therapeutic interventions and treatment. The findings are the basis for attachment-based therapies and interventions aimed at supporting positive relationships between caregivers and children.

Bowlby's attachment research into critical periods underlined the significance of early caregiving experiences in forming emotional bonds and affecting developmental outcomes.

Key study

Bowlby (1940)

Aim To investigate the link between early attachment experiences and juvenile delinquency. Bowlby aimed to understand whether interruptions to early attachment relationships contributed to antisocial behavior in older children.

Method A retrospective case study. It examined the histories of 44 adolescent boys who had been referred to a Child Guidance Clinic in London (UK). The boys had all been accused of stealing, hence the study's common name, "44 Juvenile Thieves". Bowlby and his research team collected detailed information about each boy's early family life, focusing on the attachment relationships with each boy's primary caregiver – usually their mother.

The participants were 44 British adolescent boys, aged 5–16 years, who had been referred to the clinic for stealing. As an experimental control, the study also included 44 more adolescent boys who had not committed theft. The researchers collected information from case files, interviews with the boys and their families, and overt observations conducted while at the clinic.

Results The study found that a significant number of the target group had experienced disruptions in early attachment relationships, such as separation from their mothers, inconsistent caregiving or time spent in institutional care. Many of the boys showed signs of attachment insecurity, especially an anxious-ambivalent attachment style characterized by clinginess, outbursts of anger and significant difficulty in trusting others.

The study also noted that these disturbances were usually associated with other behavioral problems, such as delinquency and theft. He noted a correlation between early attachment disruption and a propensity for antisocial behavior.

Conclusions Bowlby (1940) concluded that early attachment experience plays an important role in forming children's behavioral and emotional development. Secure attachments provide the basis for social competence and emotional regulation. Disruptions in attachment can lead to behavioral challenges and insecurity. Bowlby (1940) highlights the significance of nurturing and stable caregiving relationships during infancy and early childhood for establishing strong and positive developmental outcomes and preventing delinquent behaviors in later life.

Critical thinking

Bowlby's research focused on Western cultural contexts, but it is important to understand how attachment and critical periods are related in other cultures where caregiving practices and social norms can vary significantly. Understanding cultural differences can give a more comprehensive view of attachment development.

Bowlby's theory proposes that interruptions to early attachment relationships can have long-term effects on social and emotional development. It is important to understand the mechanisms involved – that is, how interruptions to caregiving experiences, such as neglect and abuse, during critical periods affect attachment security and psychological resilience in later life. This can inform interventions and treatments for individuals who experience adversity.

While Bowlby's research highlighted critical periods for attachment formation, other research has shown that developmental plasticity provides a degree of flexibility and adaptation with respect to later caregiving experiences. More nuanced research should consider how early attachment behavior can develop and be affected by subsequent relationships and experiences. This challenges Bowlby's idea of irreversible consequences.

Bowlby's research emphasizes the biological basis of attachment behaviors and critical periods. Genetic predispositions and biological variables contribute to the sensitivity of children to their caregiving experiences. Critical thinking can explore the relationship between genetic factors, brain development and environmental factors in critical periods. This may help to understand the intricate mechanisms underlying attachment and development.

Bowlby's longitudinal studies and observational research have given deep insight into the development of attachment behavior. However, ethical considerations arise regarding consent, confidentiality and the possible effect of findings on policies and practices. Critical thinking should consider ethical guidelines in conducting research with children to be sure the findings are used *responsibly* to enhance child welfare and family support systems.

Bowlby's research influenced parenting practices and treatment that promoted secure attachments and supporting children's emotional development. Critical thinking should assess the efficacy and cultural appropriateness of attachment-based interventions and parenting strategies: Can research based on Western participants' behavior be applied to treatment of non-Western patients? Evaluating outcomes and adapting treatment approaches based on cross-cultural research ensures interventions are evidence-based and responsive to diverse cultural contexts.

Activity 90

Bowlby's "44 Juvenile Thieves" study was conducted with only male participants. To what extent does this significant methodological characteristic affect the generalizability of the results and the applicability of the theory? Discuss in groups.

In groups of 3–4, create a series of wall charts that graphically summarize Bowlby's attachment theory and "44 Juvenile Thieves" study. Each chart should include key aspects of the theory, different attachment styles, the concept of critical periods in development, and findings from Bowlby (1940).

Critical thinking

How do Bowlby's conclusions on attachment insecurity align with current research on the effects of early trauma and neglect, and what interventions might effectively address these issues in later life?

The role of neuroplasticity in human development

Neuroplasticity is the process in which the brain's neural networks grow, reorganize and adapt in response to learning and life experiences (Figure 3.16). During critical development periods, such as infancy and adolescence, neuroplasticity is particularly pronounced, resulting in rapid cognitive and behavioral development through the creation and strengthening of neural connections. Neuroplasticity involves the generation of new neurons (neurogenesis), the strengthening of existing neurons (myelination) and the elimination of excess neurons (neural pruning). Neuroplasticity occurs as a reaction to experiences, learning or injury and is driven by a range of variables including sensory inputs, environmental changes, learning activities and injuries to the brain.

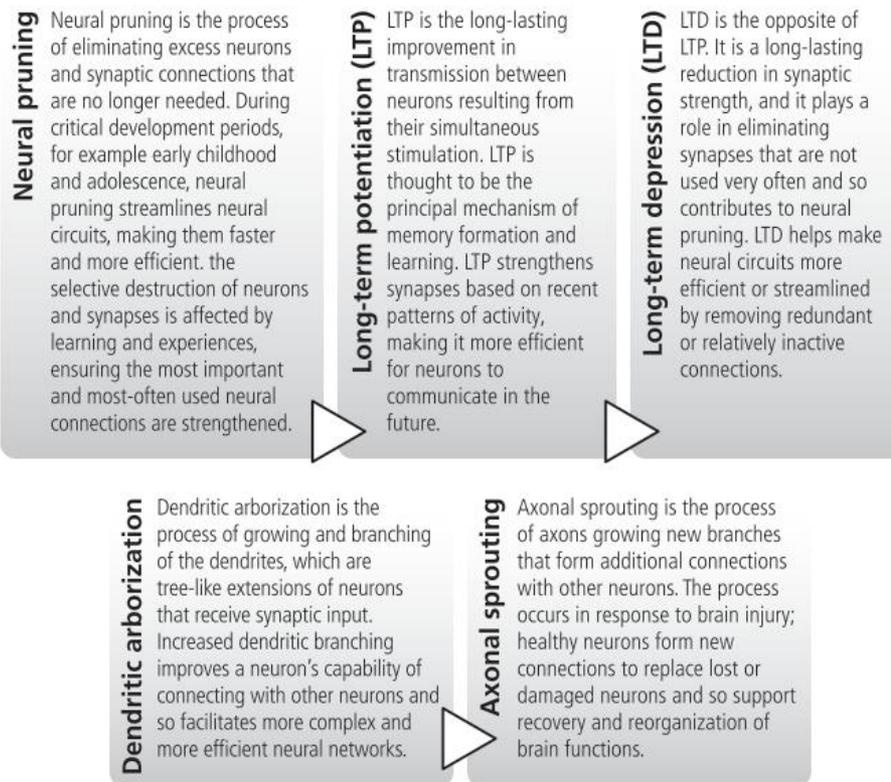


Figure 3.16 Neuroplasticity is the process in which the brain's neural networks grow, reorganize and adapt in response to learning and life experiences.

Key study

Sowell et al. (2004)

Sowell et al. (2004) discusses physical changes of the brain from childhood to old age and summarizes postmortem (Latin for “after death”) and in vivo (Latin for “in the living”) studies using a range of scanning techniques. The study reviews relatively recent studies that used advanced scanning techniques to assess age-related changes in brain structure. By integrating in vivo and postmortem findings, Sowell et al. (2004) explores when brain maturation ends and aging begins.

Aim To investigate structural changes in the human brain across different ages and to understand how such changes relate to development and plasticity.

Method A longitudinal study using MRI scans to map changes in the brains of human participants. The study included multiple scans of the same individuals over several years to map changes in brain structure.

Participants were a diverse age group (children, adolescents and adults), to cover a wide age range and to capture developmental changes over time.

Results Sowell et al. (2004) found that:

- significant changes in brain structure occur throughout life, with pronounced cortical thinning in adolescence and young adulthood and more gradual changes in later life
- regions of the brain, such as the prefrontal cortex, that are associated with the higher-order cognitive functions (for example, problem-solving, critical thinking and executive function) showed continued maturation and synaptic pruning into young adulthood (mid- to late-20s)
- there is ongoing myelination, which supports faster and more efficient neural transmission/communication.

Conclusions Sowell et al. (2004) concluded that there is significant and compelling empirical evidence supporting the concept of neuroplasticity during brain development, which demonstrates that the human brain undergoes significant structural changes due to environmental influences and developmental processes. These changes highlight the brain's ability to reorganize itself to support cognitive and functional development throughout life.

Sowell et al. (2004) provides strong empirical support for the theory that brain development is dynamic and characterized by ongoing structural changes. It highlights the significance of critical periods in development, during which the brain is especially responsive to environmental influences and experiences. The study emphasizes that neuroplasticity is not limited to childhood but continues to affect brain development and cognitive maturation well into adulthood.

Critical thinking

Sowell et al.'s (2004) longitudinal design allows for the observation of brain development over time within the same people, showing a clearer picture of how neuroplasticity affects brain structure throughout different stages of life. The longitudinal design method tracks the brain changes over time and minimizes the issues that can arise from comparing different individuals at different ages.

High-resolution MRI scans enable researchers to map cortical changes accurately and in detail, providing robust evidence of structural brain development and neuroplasticity. Such advanced imaging techniques enhance the findings' reliability and validity.

The study's sample of participants lacks diversity in terms of demographics such as socioeconomic status, culture, ethnicity and geographic location, which limits the generalizability of the findings. A more diverse sample would mean the observed brain development patterns are typical of the general population.

The study does not measure all aspects of cognitive function and focuses mainly on structural changes. Without a wide range of cognitive assessments, it is challenging to determine or conclude how structural brain changes translate into cognitive abilities and behaviors across the different developmental stages.

Helium is required for the operation of MRI scanners because helium, in its liquid form, is used to supercool the powerful superconducting magnets within MRI machines to extremely low temperatures, allowing the machines to function effectively.

Helium is a non-renewable resource, produced over millions of years through the natural decay of radioactive elements, and is found in limited quantities within natural gas deposits. Once used, helium is lost forever because it is light enough to leave Earth's atmosphere.

There are concerns about possible shortages of helium, which could increase the cost and reduce the availability of MRI scans.



Activity 91 (CAS)

In groups of 3–4, create a colorful and creative wall chart that illustrates the stages of brain development from before birth to the mid-20s. Begin by outlining the key stages: prenatal development, early postnatal development, infancy, early childhood, middle childhood, adolescence and early adulthood. Use bright colors, shapes and illustrations to show processes such as neurogenesis, myelination, synaptogenesis, neural pruning and the maturation of the brain. Label each stage with brief descriptions and highlight important developmental stages, such as the development of the prefrontal cortex and critical periods for memory formation and learning.

Sociocultural factors in development

The role of sociocultural factors in human development refers to the effects that culture and society have on an individual's cognitive, emotional and social growth. These variables include a broad range of factors, such as cultural norms and values, family and community environments, educational opportunities, socioeconomic status, peer relationships, exposure to broadcast media, and cultural beliefs (Figure 3.19). Collectively, these form individuals' perceptions of the world and influence the development of skills and behaviors throughout their lives.



Figure 3.17 Sociocultural factors play a significant role in human development.



Conceptual question

Socioeconomic and cultural factors often interact to shape cognitive and social development. How are researchers able to *measure* these interactions objectively? How do researchers identify *causal* relationships with these interactions?

Cultural norms and values shape people's behaviors, beliefs and attitudes from an early age. Societal expectations affect how people interact with others, solve problems and perceive the world. In collectivist cultures, where community and family are prioritized over individuals, individuals tend to develop a stronger sense of

interdependence and social *responsibility*. The family is the principal socializing unit, providing emotional support, teaching social norms and providing education. A stable and nurturing family environment ensures secure attachments and strong emotional development because children raised in supportive, communicative families typically have stronger emotional regulation and better social skills.

Critical thinking

In what ways do family structures and dynamics differ between collectivist and individualist cultures, and how might these differences affect emotional development?

Access to education and other socioeconomic resources significantly affects cognitive development and future opportunities; higher socioeconomic status often correlates with greater access to educational facilities, extracurricular activities and healthcare. Children from wealthier families tend to have more opportunities for better-quality learning experiences, which lead to higher academic achievement.

Peer groups are the basis of social learning and for practicing social norms, behaviors and problem-solving skills, so peer relationships are important during adolescence for identity formation and social development. Positive peer interactions and relationships tend to promote prosocial behavior and academic motivation, while negative peer interactions can promote risky behaviors.

Exposure to mass media and social media shapes perceptions, knowledge and social interactions. Media can provide educational content and social connectivity, but they can also generate risks such as exposure to inappropriate content, cyberbullying and personal crime. While educational programs and online resources typically enhance learning and cognitive development, too much screen time likely has a negative effect on attention spans and physical health.

The community environment affects safety, access to resources and social cohesion. Safe, resource-rich neighborhoods provide richer and better opportunities for physical and social activities. Children growing up in supportive and safe communities with parks and recreational facilities are likely to have more opportunities for physical, cognitive and social development.

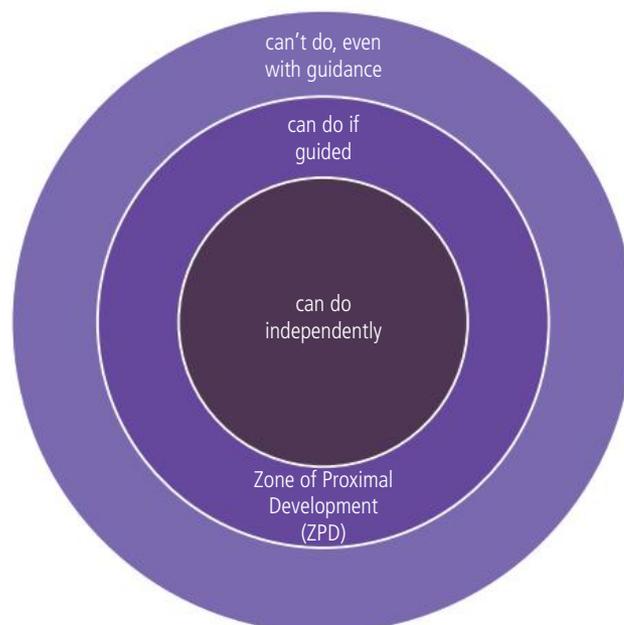
Cultural beliefs have a significant and profound effect on practices related to health, nutrition and raising children. These practices typically have direct effects on cognitive development; for example, cultural attitudes towards breastfeeding, diet, healthcare and physical activity affect children's physical growth and health outcomes.

Vygotsky's Sociocultural Theory of Cognitive Development (1962) emphasizes the critical roles that social interaction and cultural context play in the development of children's cognitive capabilities. Vygotsky believed that cognitive development is profoundly affected by social interactions; he argued that learning is inherently a social process and that children attain the tools and knowledge needed for cognitive development through interactions with more knowledgeable others, such as parents, teachers and peers. A More Knowledgeable Other (MKO) is someone who has a stronger understanding or a greater ability level than the learner (Figure 3.18).



▲ **Figure 3.18** This More Knowledgeable Other gives guidance and support to help the learner achieve greater understanding.

Vygotsky also introduced the Zone of Proximal Development (ZPD), which is the difference between what a child can do independently and what they can achieve with guidance and encouragement from an MKO. The ZPD highlights the potential for cognitive growth that can be achieved with appropriate support (Figure 3.19).



▲ **Figure 3.19** The Zone of Proximal Development.

Vygotsky also emphasized the significance of cultural tools such as language and beliefs in cognitive development. He asserted that these cultural tools are passed from generation to generation and are inherent to the way children think and learn within their culture.

Vygotsky emphasized language as a significant cultural tool. He proposed that language is the principal means through which adults provide information to children and that it has a critical role in the development of thought and other cognitive functions such as memory formation.

Key study

Vygotsky (1934)

Aim To investigate the relationship between language and thought. The study also aimed to understand how social interactions and cultural contexts influence a child's cognitive development.

Method Vygotsky used observations and experiments to study children's language use and cognitive processes, focusing on how children learn through social interactions and how they use language to organize their thoughts.

Results Vygotsky found that children's cognitive development is fundamentally associated with social interactions and that language is a significant tool for developing cognitive processes. He observed that with guided participation and scaffolding, children performed tasks beyond their unsupported capabilities.

Conclusions Vygotsky concluded that cognitive development is a social process. He emphasized the significance of social and cultural contexts in shaping how children learn and think. His work has had a fundamental impact on education in most Western societies, showing the importance of collaborative learning environments and culturally appropriate teaching practices.

Vygotsky's theory of development emphasizes the importance of sociocultural factors in development.

Critical thinking

Vygotsky (1934) promoted concepts like the ZPD and the significant role of social interaction in cognitive development. These concepts revolutionized the understanding of how children learn and develop within their cultural and social contexts, and they are still the basis of education almost 100 years later.

Vygotsky's theory has had a profound impact on educational practices in most countries. The emphasis on scaffolding and guided participation informs teaching methods that support students at all developmental levels.

Vygotsky's attention to the cultural context of learning promotes the importance of language and other cultural tools in cognitive development. This challenged the prevailing ideas of his time, which typically ignored sociocultural influences on cognition.

Lev Vygotsky died of tuberculosis in June 1934, aged 37. His last journal note was: "This is the final thing I have done in psychology – and I will like Moses die at the summit, having glimpsed the promised land but without setting foot on it. Farewell, dear creations. The rest is silence." How does this relate to the continuous development of knowledge and understanding?

TOK

Critics argue that Vygotsky's theories were based largely on observations and case studies rather than large-scale empirical research.

Some countries' education systems find Vygotsky's concepts difficult to implement because of their complexity and the need for skilled staff. Scaffolding, for example, requires knowledgeable adults who can guide learners rather than simply lecture or instruct.

Stage theories and continuous models

A stage theory of development proposes that all people move through different stages of *change* and growth. Each stage represents a distinct set of behaviors that are relatively stable within that stage, and which differ from those of other stages. According to stage theories, development occurs in sequential steps, with each stage building on earlier ones.

By contrast, a continuous model of human development proposes that growth and change is gradual and without distinct stages or transitions. This model considers growth and change as happening steadily and smoothly, with advancements building on previous levels of functioning. This model proposes that development is affected and driven by continuous interactions between a person and their environment, including other people, without discrete stages.

Continuous model: Lev Vygotsky (1896–1934)

Vygotsky's continuous model suggests that children learn and develop continuously as they age through social interactions with and teaching from more knowledgeable people. The ZPD represents the difference between what learners can achieve independently and what they can achieve with support and guidance. This concept implies a continuous progression during which development occurs through interaction with others.

Vygotsky highlighted the importance of social and cultural factors in cognitive development. He considered development to be a dynamic and continuous process heavily affected by what he called cultural tools, such as language and symbols, and by social interactions. Vygotsky's proposal is a continuous model in which development occurs through ongoing interactions within the person's culture and environment.

Critical thinking

How does Vygotsky's theory of cognitive development contrast with other theories that place a stronger emphasis on individual learning processes?

Stage theory: Jean Piaget (1896–1980)

Piaget proposed a four-stage theory of cognitive development (Figure 3.22). He described how children create knowledge and understanding by interacting with their environment, leading to four discrete stages of cognitive development: sensorimotor, preoperational, concrete operational, formal operational. Each stage describes a different way of perceiving the world.

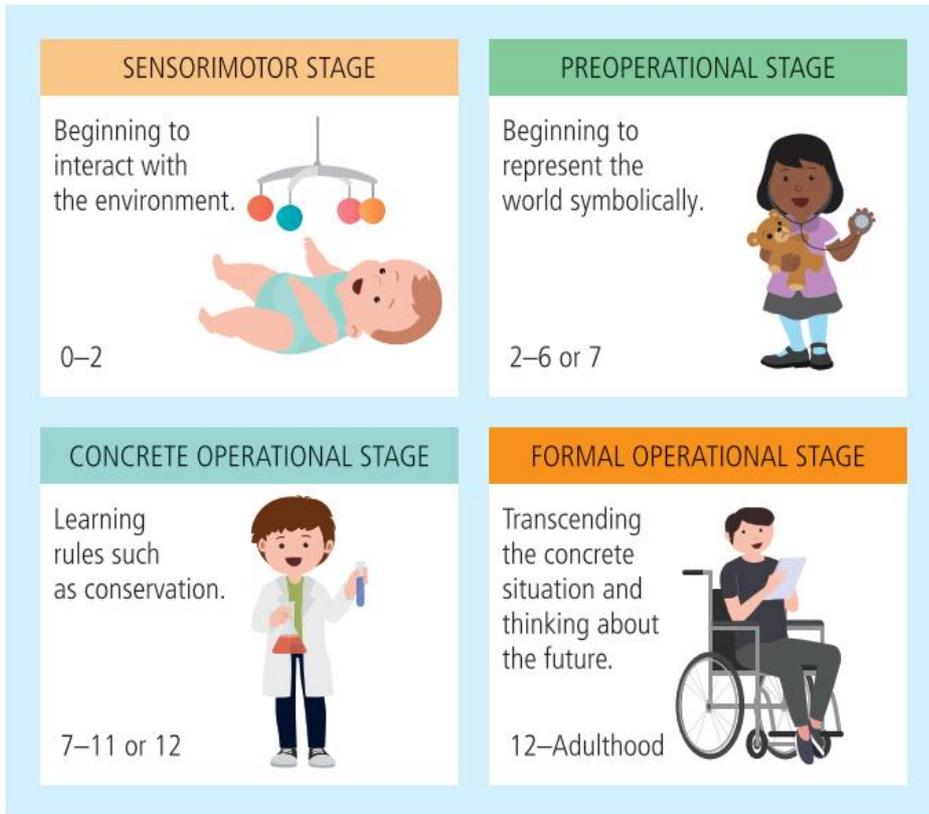


Figure 3.20 Piaget's theory of cognitive development.

Vygotsky's theory, while emphasizing social and cultural influences, is a continuous model that proposes development occurring through ongoing learning experiences. The ZPD suggests a continuous process of growth generated by social interactions and supported, guided learning.

Piaget's theory is structured in distinct, separate stages; Vygotsky's theory incorporates elements of both progression and continuous development through interactions. Both theories facilitate our understanding of development by emphasizing different factors in acquiring knowledge and understanding.

Activity 92

Form two groups to debate the topic: "Which model is better for understanding cognitive development, Piaget's stage theory or Vygotsky's continuous model?" Each group must gather evidence supporting their theory/model. The Vygotsky group should focus on social interaction and cultural context, while the Piaget group should focus on developmental stages. Each group should prepare opening statements, essential arguments, counterarguments and a closing statement. After the debate, note the strengths and weaknesses of each theory/model and discuss which aspects are most compelling.

Stage theories

Stage theories give clear developmental milestones that help organize and simplify complex developmental processes and are useful for understanding and predicting development. They categorize behaviors and cognitive abilities into distinct phases, which makes communication easier between researchers, educators and practitioners who work with children and adolescents.

Critical thinking

How do stage theories address or overlook cultural and social differences in the developmental milestones they propose?

Stage theories may be reductionist, oversimplifying the intricacy of development by stating that children simply progress through stages in a straightforward manner, when in reality, development tends to be variable and affected by many environmental and biological factors.

Stage theories often neglect to account for individual differences, such as unique life experiences, and this can limit their applicability to more diverse populations.

Critical thinking

What are the implications of oversimplifying development through stage theories when applied to children with atypical developmental paths, such as those with learning disabilities or developmental disorders?

Continuous models

Continuous models are more flexible and acknowledge that development is an ongoing and uniquely individual process. They allow for variations in the timing and rate of development.

Continuous models recognize the role of environmental factors, such as interactions with caregivers and peers, and cultural contexts. This *perspective* highlights the significance of contextual learning and continuous adaptation to changing circumstances.

Critical thinking

How can educators and practitioners use continuous models to create more individualized learning plans that accommodate diverse developmental needs?

Continuous models tend to be more complex, so predicting when development occurs is more difficult than with stage theories. The lack of distinct stages tends to make it more difficult to identify specific developmental transitions. The dynamic nature of continuous development tends to pose more challenges in educational and clinical situations, where guidelines and milestones tend to be preferred. Continuous models tend to require more individualized assessment tools and interventions tailored to individuals' unique needs.

Summary of critical analysis

Integrating stage theories and continuous models may provide a better understanding of development. Recognizing ongoing processes and specific stages would likely allow for a more realistic exploration of how children develop cognitively.

Both approaches are improved when contextual factors are considered, such as cultural factors, socioeconomic status, family situations and physical environments, which can shape development in different ways.

Researchers should evaluate which model/theory best fits the phenomenon they are studying in order to reach a better decision in education, research and therapy.

Theory of mind

Theory of mind (ToM) is the cognitive ability to attribute mental states, such as beliefs, emotions and knowledge, to oneself and others. ToM requires an understanding that others have thoughts, opinions and feelings that may differ from one's own. This is critical for effective relationships because it allows people to predict and interpret others' behavior, to empathize and to communicate effectively. The development of ToM is a significant milestone in early childhood, usually around age 4–5 years, and is indicated by children's ability to pass false-belief tasks, for example, understanding that others can believe something that is different from reality (Figure 3.21).



Figure 3.21 The development of ToM is a significant milestone in early childhood, and is indicated by children's ability to pass false-belief tasks, for example, understanding that others can believe something that is different from reality.

The development of ToM tends to continue as children age and experience life situations. ToM plays an important role in understanding cognitive development by showing how individuals develop the ability to understand others in social contexts. ToM is essential for navigating social interactions and forming relationships.

ToM allows children to develop empathy and prosocial behavior. By understanding others' perspectives and emotions, children can respond sensitively in social situations and foster supportive interactions and relationships. ToM improves a person's ability to appreciate others' perspectives and viewpoints, which is an important cognitive skill for effective communication, conflict resolution, teamwork and collaborative problem-solving.

There is thought to be a strong link between ToM and language development because the ability to talk about other's thoughts, beliefs and emotions tends to develop alongside ToM.

ToM also plays a role in moral reasoning and ethical decision-making because both require the child to think about a situation from another's perspective, for example: "How do you think Klition feels about you playing with his football?" Understanding the thoughts behind others' behavior helps children to make clearer decisions about right and wrong.

Educators use knowledge of ToM to create learning activities that encourage perspective-taking and empathy to enhance students' social skills and to make classroom interactions more effective (Figure 3.22). Understanding ToM is also important in clinical situations, especially for diagnosing and treating children and adolescents with developmental disorders such as autism spectrum disorder, in which ToM development may be atypical. Parents can foster ToM in their children with activities that include discussing other children's emotions, perspectives and experiences. Reading stories and engaging in pretend-play are good ways to enhance children's ToM.



▲ **Figure 3.22** Educators use knowledge of ToM to suggest activities that encourage perspective-taking and empathy.

Key study

Wimmer and Perner (1983)

Aim To investigate whether young children can understand that others can have false beliefs and therefore demonstrate an aspect of ToM.

Method Children watched a situation in which a doll named Sally placed an object in location *x* and then left the scene. The children then saw another doll, named Anne, move the object to a different location (location *y*). The observing children were then asked where Sally would look for the object when she returned to the scene. The participants were 36 children aged 3–9 years.

Results The study found that none of the 3–4-year-olds, 57 percent of the 4–6-year-olds and 86 percent of the 6–9-year-olds indicated that Sally would look for the object in location *x*. Indeed, 4- to 6-year-olds remembered the first location only 20 percent of the time.

Wimmer and Perner (1983) included a second task to test the stability of the children's understanding of false beliefs. In the second task, the story continued with a statement about Sally's intention to either deceive an antagonist (not a friend) or truthfully tell a friend about the object's new location. Regardless of their age, the children who correctly predicted that Sally would look in the original location (*x*) also correctly indicated that Sally would deceive the antagonist by directing them to the original location (*x*) and truthfully inform the friend by directing them to the new location (*y*) 85 percent of the time.

Conclusions Wimmer and Perner (1983) concluded that the ability to attribute false beliefs to others develops around the age of 4 years, indicating a significant milestone in ToM development, which is critical for understanding cognition and social interactions.

Critical thinking

ToM is important for understanding and predicting the behavior of others. It enables individuals to understand others' beliefs, intentions and emotions, which is essential for effective communication and empathy. How might deficits in ToM impact social relationships and mental health?

As evidenced by the ability to understand false beliefs at around age 4 years, it seems ToM is a gradual process. What variables affect the variation in the timeline of ToM development among children? Would a child's culture be a factor? Parenting styles? Individual cognitive differences? Physical environment?

Understanding ToM informs many educational strategies to support social and emotional development. How can teachers use ToM research such as Wimmer and Perner (1983) to create classroom environments that encourage empathy, cooperation and conflict resolution skills?

Wimmer and Perner (1983)'s use of the false-belief task (the Sally–Anne activity) was very effective in showing that some children had developed ToM and others had not, but there were limitations to the method (for example, its reliance on verbal responses and possible cultural biases) that may affect the validity and generalizability of the findings.

Wimmer and Perner (1983) found that understanding false beliefs typically occurs around age 4. The study was about 50 years ago. Is it possible that the proliferation of internet-based media may have *changed* the age at which ToM develops in children who are heavy users of computer games and mass media?

The second task, involving deception and truthful informing to a friend, gave the researchers greater insight into the children's understanding of other children's intentions and beliefs. How did this additional task strengthen the study's conclusion?

To what extent is the ability to empathize a valuable skill in high school?

TOK

Activity 93 (CAS)

Design and create a graphical representation of the two tasks conducted by the children in Wimmer and Perner (1983). Add a concise conclusion of the study.

Critical thinking

How can we improve our ability to empathize?

You should have an understanding of the areas of study in Table 3.11.



Development of self

Area of study	Learning objectives
Attachment	The role of attachment in the development of self.
Enculturation of social norms	The role of enculturation of social norms in the development of self.
Peer influence	The role of peer influence in the development of self.
Role of childhood experiences	The role of childhood experiences in the development of self.

Table 3.11 Development of self learning objectives from Subject Guide, page 30.

The development of self is the process in which a person becomes aware of themselves as an autonomous entity, able to reflect on their own thoughts, emotions and behaviors (Figure 3.25).

Self-awareness is the ability to recognize oneself as being distinct and different from others and to be able to think about one's own existence. It usually begins in early childhood when children can recognize themselves in a mirror or understand that their emotions and thoughts are their own.

Self-concept is the understanding and perception of oneself, including one's own physical characteristics, capabilities, attitudes and opinions. Self-concept develops by interacting with others and is affected by culture, social comparisons and feedback from others.



Self-esteem is the value one places on oneself and involves judgments about one's competence and worth.

Identity formation is the process of developing a unique personality or a clear sense of self. Identity is often related to personal, social and cultural variables and becomes especially critical during adolescence when people are exploring different characteristics of who they are and who they want to be.

Self-regulation is the ability to control one's own behavior, including emotions and thoughts, to achieve long-term goals. This typically requires developing skills such as goal-setting, impulse control and the control of emotions.

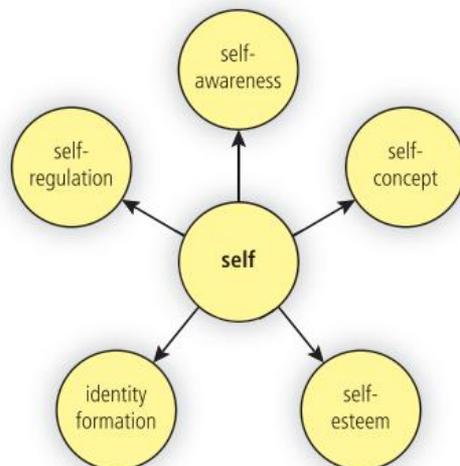


Figure 3.23 The development of self.

Attachment

Attachment is a strong and lasting emotional bond that forms between a child and their primary caregiver, usually developing during the first year of life. This bond affects a child's feeling of security and their ability to regulate their emotions. Attachment plays a critical role in the development of self, affecting a person's self-concept, self-esteem and identity formation.

Attachment relationships, particularly those formed during early childhood, provide children with a secure base from which to explore the world. When caregivers are consistent and responsive, young children feel safe and supported. This generates a sense of security and confidence in children as they navigate their physical and social environments. A secure attachment relationship is the basis of trust. When children trust their caregivers to meet their needs, they feel safe to explore and interact with the world. This trust is critical for the development of a positive self-concept.



Caregivers typically reflect their children's emotions through responses and reactions. This helps children to recognize and understand their own emotions, which contributes to self-awareness. Through their interactions with their caregivers, children start to see themselves as unique people. Caregivers' reactions to a child's behavior help the child to understand the consequences of their behavior and to develop a sense of self. When caregivers give children affection and positive reinforcement, children develop a sense of self-worth and they feel valued and appreciated, which increases their self-esteem. When caregivers validate and acknowledge a child's emotions, the child learns that these emotions are important and worthy of attention. This is important for developing positive self-esteem.

Critical thinking

How might caregivers' differing approaches to emotional validation affect a child's ability to recognize and express their emotions?

Attachment experiences affect people's working models of their sense of self and others. Secure attachment leads to a positive internal working model; the person understands themselves as worth being loved and others as being reliable and supportive. This positive model affects how people form relationships and how they perceive themselves in social situations.

Caregivers serve as children's role models with regards to behavior, attitudes and values. By identifying with their caregivers, children start to form their own identity and incorporate aspects of their caregivers' personalities and behaviors into their own self-concept.

Secure attachment helps children learn to control their emotions. Caregivers who give children comfort and guidance teach these children how to manage their feelings of stress and how to cope with negative emotions, contributing to more effective self-regulation. Securely attached children tend to feel confident in their ability to behave independently, so caregivers who encourage independence and exploration help their children to develop agency and competence.

Attachment affects the development of self by providing security, encouraging self-awareness and self-reflection, growing self-esteem, helping the formation of a unique identity and encouraging autonomy and self-control. The quality of early attachment experiences affects the internal working models that people take into subsequent relationships and social interactions, affecting their sense of self and overall mental well-being.

Key study

Sroufe et al. (2005) (The Minnesota Longitudinal Study of Risk and Adaptation)

Aim Initiated in the 1970s, Sroufe et al. (2005) was a longitudinal study that aimed to outline general trends in development and to describe the course of individual lives.

Method The study followed 180 American participants from before birth to about age 30. The study initially focused on families living with high stress and instability but transitioned to a longitudinal format due to early losses from the study. The initial participants were selected from first-born children of mothers qualifying for public (government) financial support.

Results Throughout the study, assessments generated over 10,000 variables, and supported conclusions on development, *change* and continuity. The study found effects of early caregiving on attachment styles and eventual life outcomes, such as associations between resistant attachment and anxiety disorders, and avoidant attachment with behavioral issues. The study found that the parenting styles and behaviors observed when the children were 2 years old predicted similar interactions in the next generation, decades later.

The study identified factors critical in breaking cycles of abuse, predicting high school dropout rates based on early caregiving quality, and linking childhood behavior issues with later relationship difficulties. The study's findings highlighted the predictive nature of developmental patterns and gave insights that proved valuable for clinical practice, intervention strategies and classification systems like the Diagnostic and Statistical Manual.

Conclusions Using rigorous assessment methods in multiple contexts, Sroufe et al. (2005) concluded that development follows predictable pathways.

Critical thinking

Sroufe et al. (2005) is a significant contribution to understanding development through attachment theory. Spanning nearly three decades, the study thoroughly tracked a cohort of children from before birth and provided clear insights into how early life experience shapes social and psychological outcomes in adulthood.

One of the study's strengths is its longitudinal design, which allowed researchers to observe development over an extended timeframe. This allowed researchers

to identify critical factors that affect attachment styles and later behaviors. By considering and *measuring* over 10,000 variables, the study was a comprehensive analysis of the intricacies of development, offering detailed insight into the relationship between early caregiving, attachment and long-term outcomes.

Furthermore, the study's ability to predict later-life outcomes, such as anxiety disorders and behavioral issues, based on early attachment experiences highlights its practical implications for clinical practice and treatment. The study's findings validated theoretical frameworks within attachment theory and highlighted the predictive validity of early assessments for understanding developmental problems.

Sroufe et al. (2005) has some limitations. The sample's initial selection criteria focused on families facing high stress and instability, which may limit the generalizability of findings to populations that do not experience such circumstances. The loss of participants throughout the study, particularly those from the most stressed families, raises the possibility of *biases* in the study's conclusion.

While the study provides qualitative insights into developmental pathways, the large number of variables makes it challenging to establish *causal* relationships with certainty. This complexity may hide more detailed interactions between variables.

Despite these limitations, the study's thorough approach and rigorous methodology have contributed significantly to the understanding of how early experiences shape development. Its findings have clear implications for policy makers, educators and clinicians. The findings emphasize the importance of early intervention and supportive childhood environments in promoting positive developmental outcomes in later life.

To what extent do longitudinal studies adequately record the intricacy and variability of development?

TOK

Activity 94

Write a one-page summary of Sroufe et al. (2005).

Enculturation of social norms

Social norms are unwritten rules and expectations about how people are expected to behave in a society or group. These norms guide group members' behavior and social interactions and help to maintain order and cohesion within a community. In the context of the development of self, social norms have a significant effect on a person's behavior, attitudes and self-concept by providing a template for what society considers acceptable and right or unacceptable and wrong. Conforming to social norms tends to reinforce a person's sense of identity and belonging, while deviating from social norms tends to lead to social sanctions and can affect one's self-perception and self-esteem.



Conceptual question

How do social norms differ across individualistic and collectivist cultures, and how might these *perspectives* influence the development of self-concept?

Enculturation is the process by which people learn and take on their own culture's values, customs, beliefs and behaviors. This process occurs through a range of means, such as family, school, peers, media and government. In the context of the development of self, enculturation molds a person's identity, attitudes and sense of belonging by forming cultural norms and expectations that affect how the culture's or group's members perceive themselves and relate to others.

Critical thinking

To what extent does enculturation create rigid self-identity, and how might exposure to diverse cultural experiences affect that identity?

Family members model behaviors and reinforce norms through daily interactions, shaping a child's understanding of acceptable and expected behaviors. This fundamental family influence is usually the basis of a child's identity and social behavior. From birth, children are taught cultural values and behaviors by their parents, sometimes by direct communication but often by role modeling. For example, a child raised in a culture that values collectivism will learn to prioritize the family's and the community's needs over their own preferences. This molds their self-concept to be community-focused and interdependent.

Kindergartens and schools play a major role in the enculturation process by providing structured environments where children learn the society's values and norms that contribute to their self-identity and correct social functioning. In almost all countries and communities, schools teach not only academic knowledge but also societal norms such as punctuality, respect for authority, collaboration and often patriotism.

In South Korea, children learn the highly valued concept of *jeong*, which means a deep, emotional connection based on the importance of the community and relationships. *Jeong* is reflected in the practice of shared meals at school, which South Korean children often eat together in their classrooms, serving each other and eating the same food. Children learn the importance of *jeong* through togetherness and mutual care and respect for others. *Jeong* teaches South Korean children that individuals' actions contribute to the well-being of the community, which reinforces the value of collectivism in South Korean culture.

In Fijian culture, the value of respect for elders and communal living runs deep. Young Fijian children participate in *meke*, which is traditional song and dance. These performances are artistic, but they are also a way of teaching children about their culture, their community and the respect they owe to their elders and ancestors. As they learn and practice *meke*, Fijian children also learn to work together in harmony, respect their traditions and understand their role within the community.

In Samoa, *Fa'a Sāmoa*, which means the Samoan way of life, emphasizes respect for family and the community. The 'aiga system requires even young children to be actively involved in family and community responsibilities. Activities such as helping prepare for communal feasts, participating in religious ceremonies and caring for younger siblings teach children family solidarity, respect and their role within society. Through this 'aiga system, Samoan children learn to value their family's and their community's well-being, reflecting the collective values of Samoan culture.

Critical thinking

How might the strong emphasis on community and family values in cultures like those of Samoa or Fiji impact an individual's sense of personal agency and independence?

Peers provide prompt social feedback and reinforcement, which influence a person's self-concept and behavior. Acceptance or rejection by peers is often determined by the extent to which children adhere to social norms and helps shape social identity and self-esteem. Adolescents often adopt language, dress and behaviors that are popular within their peer group. A teenager in the USA or Europe, for example, might adopt fashion trends and speak slang used by their friends to conform to group expectations and gain social acceptance.

Media and technology are effective enculturation tools. By constantly reinforcing cultural norms and ideals, the media shapes people's perceptions of themselves and the world around them. Media portrayals of gender roles, success and beauty influence how people perceive themselves and the roles to which they aspire. For example, exposure to media that idealizes thinness affects body image and self-esteem.

Religious and cultural traditions give people a sense of stability and reassurance and offer people a framework to understand their place in the world and their connection to their cultural history. Participating in religious practices and cultural rituals, such as attending church or celebrating cultural dance, music and sports events, reinforces a person's sense of identity and belonging to their culture (Figure 3.26).

The workplace is a critical arena for adult enculturation, where employees adapt to the norms and expectations of their professional community and so refine their social identity. Workplaces teach norms such as teamwork, professionalism and moral behavior. An employee learns social dynamics among colleagues, and this shapes their professional identity and perception of themselves.

How does the process of enculturation challenge the idea of a universal self-concept? What role does the researcher's own cultural background play in studying the enculturation of social norms and self-perception?

TOK



Figure 3.24 Participating in Diwali celebrations, for instance, teaches the cultural significance of the festival and allows the individual to feel connected to others from the community who also celebrate.

Key study

Markus and Kitayama (1991)

Aim To explore how cultural norms shape the self-concept and related cognitive, emotional and motivational processes.

Method A meta-study to review a number of empirical studies comparing individualistic cultures, such as the USA, and collectivist cultures, such as Japan.

Results The study found that people in individualistic cultures develop an independent self-concept, while people in collectivist cultures develop an interdependent self-concept.

Conclusions Markus and Kitayama (1991) concluded that cultural norms have a profound effect on the way individuals perceive themselves and their relationships, and that this affects their cognitive processes, emotions and motivations.

Critical thinking

Markus and Kitayama (1991) propose that cultural norms profoundly mold people's self-concept, with individualistic cultures creating an independent self and collectivist cultures creating an interdependent self. This may be reductionist, and too simplistic to truly reflect the rich variety of people within both types of culture. For example, the study does not consider Japanese emigrants to the USA or US immigrants in Japan. Researchers might ask if there are hybrid forms of self-concept that blend both independence and interdependence.

The studies employ cross-cultural comparisons to reach conclusions about the role of enculturation and social norms in self-development. However, one should critique the methods used to ensure cross-cultural appropriateness of the methods, such as the translation of questionnaires and perceived conformity and demand characteristics of participants. To what extent do these methods affect the validity of the findings, and are there *biases* introduced by researchers' cultural *perspectives*?

These studies often focus on specific cultural groups, such as Americans, Japanese, Germans and Mexicans, but these cultures are diverse, so it is important to consider whether the participants are actually representative of the culture they apparently represent. For example, there is significant cultural diversity within the USA. To what extent does the inclusion of more diverse subpopulations of these cultures affect the study's conclusions about aspects of the self-concept?

Activity 95

In groups of 3–4, read the following which is based on an idea from Markus and Kitayama:

American parents who are trying to encourage their children to eat often say, "Think of all the starving children in the world", whereas Japanese parents are more likely to say, "Think about the farmer who has grown this rice".

Use these two contrasting perspectives to create a poster or wall chart that shows the role enculturation plays in the development of self.

Peer influence

A peer is an individual who is of similar age, social or economic status, or ability as another person. Peers typically share common social contexts. Examples include classmates, teammates or friends within the same age group.



Peer influence refers to peers influencing each other's attitudes, emotions, behaviors and development. This influence can be both direct, through explicit encouragement to conform, and indirect, through the common adoption of the peer group's norms, values and behaviors. Peer influence plays a critical role in the development of self because it molds an individual's identity, self-esteem and social skills.



Conceptual question

How does peer influence *change* between adolescence and adulthood, and how might this affect the development of self-concept in each stage?

Activity 96 (CAS)

Identify three different peer groups to which you belong and note two positive influences from each group. Create a poster in your notebook that illustrates the three groups and the positive influences.

Critical thinking

To what extent do your peer groups affect the way you perceive yourself? When you ask yourself, "Who am I?", to what extent is your response influenced by your peers?

Interacting with peers helps people define their identity. Peer groups provide a mirror that reflects back self-perceptions, helping people to understand themselves. Peers are essential for social learning because they help people learn how to interact, communicate and form relationships, which are essential for developing social skills and norms.

Critical thinking

In what ways can peer influence be both a positive and negative force in shaping an individual's self-esteem and decision-making processes?

Positive reinforcement and acceptance received from peers boosts self-esteem and confidence, while negative peer interactions can erode self-worth and contribute to social anxiety and low self-esteem.

Peer groups establish and enforce behavioral norms to the extent that group members tend to adapt their behaviors to conform with their peer group's expectations and practices. This can affect lifestyle choices, academic or work performance, and social behavior.

Key study

O'Brien and Bierman (1988)

Aim To investigate developmental *changes* in perceptions of peer groups and group influence.

Methods The study used 72 participants: boys and girls from grades 5, 8 and 11–12 males and 12 females randomly selected from each grade. The participants were all pupils of a small, rural, predominantly white middle-class community in the USA and were aged from 10 years 5 months to 17 years 9 months.

The method used was interviews conducted on an individual basis at the participants' school during a free lesson. The interviewers were the research's primary author and two trained female undergraduate psychology students. The participants' audio responses were recorded and transcribed. The interviews assessed the participants' perceptions of their peer groups and peer influence. They also assessed the perceived emotional effect of peer group acceptance or rejection.

Results The study found that preadolescents defined their peer groups based on common activities and social behavior; they considered group influence to be greatest in these domains. Older, adolescent participants described peer-group influence as global and far-reaching, and they identified influences on appearance, illicit acts attitudes and values.

Conclusions O'Brien and Bierman (1988) concluded that developmental changes in perceptions of peer groups and peer influence correspond to age-related increases in the extent to which peer-group acceptance or rejection impacts a person's self-evaluation. The study also concluded that adolescents perceive peer groups as having a broader and more significant impact on their behavior, attitudes and self-concept compared to preadolescents.

Critical thinking

O'Brien and Bierman (1988) focused on a small, rural, predominantly white middle-class community in the USA, which limits the study's generalizability to more diverse populations. It is not clear if the same results would be achieved if the participants were of different ethnicities or socioeconomic statuses.

The study was conducted in 1988, and the findings may be influenced by the social and cultural norms of the time, which could differ significantly from contemporary contexts. Developments in technology, social media and cultural attitudes toward peer behavior may mean that current peer-group behavior and interactions are significantly different from those observed in the study.

The study relied on self-reported data collected through interviews, which may be subject to participant *biases* such as social-desirability bias or **recall bias**. Also, transcription of audiotaped responses may introduce subjective interpretation by the researchers. This may affect the consistency and reliability of the study's data.

Key study

Santos et al. (2017)

Aim To understand how peers influence each other's ethnic-racial identity (ERI), focusing on centrality (the significance of the ERI in a person's self-definition), private regard (the personal evaluation and emotional response to belonging to a peer group) and public regard (a person's perception of how others perceive their ethnic-racial group).

Method Using longitudinal social network analysis, Santos et al. (2017) investigated data from two US schools. One school was predominantly Latinx and the other was more diverse.

Results The study's results showed that peers in both schools influenced each other's public regard. Peer influence on centrality was seen only in the predominantly Latinx school. Influence on private regard was observed in the diverse school. These results underline the significance of peers in molding ERI during early adolescence.

Conclusions Santos et al. (2017) concluded that peer influence on ERI varies according to social context. Peer influence on centrality was significant in the predominantly Latinx school, while influence on private regard was more evident in the diverse school, suggesting that the ethnic composition of a peer group plays a significant role in how ERI is shaped. This shows the importance of context in research relating to the development of self.

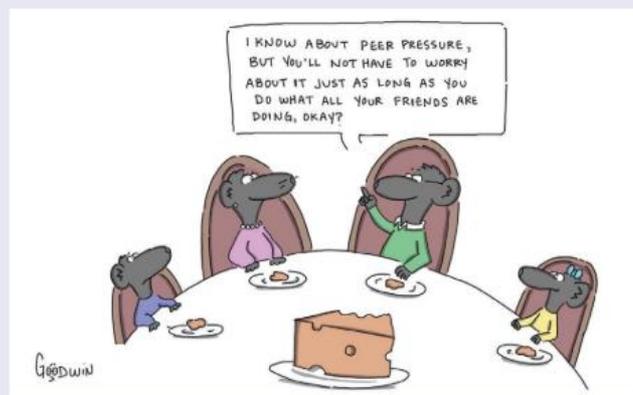
Critical thinking

By employing social network analysis, Santos et al. (2017) captured the dynamic nature of peer influence. This method allowed for an intricate understanding of how ERI evolves in early adolescence and provided strong evidence of peer influence.

Due to its reliance on longitudinal data, the study's conclusions depend on the consistency of the data collected at different times.

While the study included data from a mainly Latinx school and a diverse school, the characteristics of these schools limits the generalizability of the results. The results may not fully apply to schools with other ethnic compositions or in other locations.

The study focused only on early adolescence, so the results may not be as relevant to other developmental stages.



Role of childhood experiences

With respect to the development of self, childhood experiences refers to the events, interactions and situations that a child experiences during their early years, typically from birth through adolescence. These include parental relationships; the family environment; social interactions; educational experiences; cultural, religious and community influences; traumatic events; and play and leisure activities (Figure 3.25). These experiences can affect a child's personality, beliefs, emotions, behaviors and overall sense of identity.



Figure 3.25 The role of childhood experiences in the development of self.

The nature of interactions and attachments with primary caregivers, including aspects of warmth, support, discipline and attachment styles, can affect the development of self. For example, a young child who receives consistent affection, comfort and support from their parents is likely to develop a secure attachment, while a child who experiences neglect or inconsistent care is likely to develop an insecure attachment.

The dynamics within the family, such as the presence of brothers and sisters, the family structure (for example, a single-parent, nuclear or extended family), socioeconomic status and the holistic emotional environment within the home, all play a role in the development of self. For example, a child living in a two-parent home with financial problems may face different challenges and stressors to a child in a financially well-off, single-parent home.

Relationships and interactions with peers, teachers, community leaders and other relevant people outside the family contribute to social learning, relationships and social-skills development. For example, a school-age child who forms a strong friendship with a classmate will likely learn cooperation and empathy, and an adolescent who uses a sports coach as a mentor will likely improve their confidence and raise their aspirations.

The nature and quality of a child's schooling (including academic achievements, relationships with staff and peers, and involvement in extracurricular activities) can have a strong and positive effect on a child's development of self. For example, a student who achieves good grades and participates in the school-led community service programs and a sports team will likely develop a sense of accomplishment.

A child raised in a community with strong cultural traditions is likely to develop a sense of identity and belonging through participation in culture-based activities. A child who enjoys drawing, making music or playing with building blocks develops fine motor skills and creativity. Children involved in team sports typically develop self-discipline and teamwork skills.

Conversely, negative or traumatic experiences – such as neglect, abuse, loss of a parent, sibling or close friend, or witnessing violence – can have lasting effects on a child’s development. For example, a child who often observes domestic violence is likely to experience anxiety and trust issues later in life.

How do relationships with peers and mentors outside the family contribute to the development of social skills and self-esteem in children and adolescents? How can research reach a robust conclusion regarding this question?

TOK

Class practical

Research method: Observation

Observation is a research method that involves systematically watching and recording behaviors, events or interactions in their natural or artificial settings. The purpose of an observation is to gather real-time data, enabling researchers to understand behaviors, social interactions and environmental conditions as they naturally unfold. A feature of the observation method is direct data collection: the observer records information firsthand without interacting with the participants. Observations are usually structured around a specific focus, with predefined behaviors, interactions or phenomena to observe. Observations are context-specific; they are often used to capture data within a natural environment or controlled setting to analyse how participants behave or respond in each situation. Observers try to maintain objectivity, although this can be challenging in certain forms of observation, such as participant or covert observation.

There are different types or variants of observation, and each is suited to different research goals.

Naturalistic observation involves observing participants in their natural environments without any manipulation or interference. This method allows the researchers to study behaviors as they naturally occur. Subjects are often kept unaware of the observation, to prevent them altering their behavior. The researcher remains non-intrusive, allowing for the exploration of complex social behaviors, habits or interactions. For example, observing children playing in a park provides insights into spontaneous behaviors.

Controlled observation occurs in a structured or laboratory setting where the researcher manipulates the environment to observe specific responses. Controlled observation allows for greater control over external variables and is often used to test hypotheses, although it may affect participant behavior due to their awareness of being observed.

In overt observations, participants are aware that they are being observed. The researcher’s presence and the study’s purpose are transparent, which addresses ethical concerns by ensuring participants give informed consent. However, overt observation risks influencing participants’ behavior due to the “Hawthorne effect”, whereby participants alter their actions because they know they are being watched. An example of overt observation is a workplace study where employees are informed that they are part of a research project.

On the other hand, covert observation involves participants being unaware that they are being observed, which can reduce reactivity and ensure more natural behaviors. Covert observation raises ethical concerns, as participants have not consented to being studied, but it is often used in studies where natural, unaltered behavior is crucial, such as observing customer behavior in a store.

Participant observation requires the researcher to be actively involved in the group or environment they are studying. This immersive approach gives deeper insights, as the researcher experiences the context firsthand. However, this involvement can lead to *bias* if the researcher becomes too engaged or emotionally involved with the participants. Participant observation is commonly used in ethnographic studies or fieldwork that requires long-term immersion. For instance, a researcher living in a remote community to study its cultural practices might adopt the role of a community member.

In non-participant observation, the researcher remains an outsider, merely observing and recording data without getting involved in the activities. This method reduces the risk of bias and allows for a more detached and objective *perspective*. For example, a researcher might observe classroom dynamics without interacting with the students or the teacher.

These variants of observation can be combined to suit the research objectives. For example, a researcher might choose naturalistic, covert, non-participant observation to study interactions in a public space without interfering or revealing their identity. Conversely, a controlled, overt, participant observation approach might be employed in a laboratory setting, where the researcher creates a structured activity and actively participates while observing the outcomes.

While observation offers several advantages, such as providing real-time data and allowing the study of natural behaviors, it also presents challenges. The method is often time-consuming, requiring extended periods of observation to capture sufficient data. Ethical issues arise, particularly in covert observation, where participants are unaware of being observed. Furthermore, observer bias can impact the validity of findings, especially in participant observation, where the researcher's involvement may influence their interpretations. Despite these limitations, observation remains a valuable research method, offering rich and detailed insights into social behaviors, environmental interactions and psychological processes.

Possible research questions for investigating human development using observational methods

- 1 How do children develop social skills during free play in early childhood education settings?
- 2 How do peer interactions in adolescence affect the development of self-esteem?
- 3 What role does non-verbal communication play in parent–infant bonding during the first year of life?
- 4 What coping strategies do children use when experiencing peer rejection in a school environment?
- 5 How do siblings' interactions shape the development of conflict resolution skills in middle childhood?
- 6 What role does cultural background play in shaping children's play preferences and peer-group formation?

- 7 How do children in different cultures approach problem-solving tasks in group settings?
- 8 What impact does teacher feedback have on children's engagement and participation during classroom activities?
- 9 How do adolescents modify their behavior in response to peer pressure in social settings?
- 10 How do parenting styles influence the development of autonomy in children during middle childhood?

Class practical: example

Note: For the purpose of the class practical, the observation will be a naturalistic, overt, non-participant observation. This is an example only. You may create your own observation study.

Research proposal Investigating the impact of a teacher's feedback on children's engagement and participation during classroom activities.

Research method This study will employ a naturalistic, overt, non-participant observation method to investigate the impact of teacher feedback on children's engagement and participation during classroom activities. Naturalistic observation ensures that the behavior is observed in its typical setting without interference, providing authentic insights into how feedback from teachers influences students' involvement in classroom tasks. The observation will be overt, meaning the students and teacher will be aware of the observation but will not interact with the observer. Non-participant observation ensures the researcher does not interfere with or influence the classroom dynamics.

Ethical considerations The study involves children and an educational setting, so several ethical considerations will be addressed.

- **Informed consent:** Written consent will be obtained from the school administration, the teachers and the parents or guardians of the participating children before any observations are conducted.
- **Assent from children:** Children will be informed, in age-appropriate language, that they are being observed during regular classroom activities. Although participation is non-invasive, their assent will be obtained to ensure ethical compliance.
- **Confidentiality:** All data collected will be anonymized, and the identity of the students, teachers and the school will not be revealed in any reports or publications.
- **Right to withdraw:** Participants, including the school, teachers and children, will have the right to withdraw from the study at any time without any negative consequences.
- **Minimizing disruption:** Observations will be conducted in a way that minimizes any disruption to the normal functioning of the classroom.

Participants The study will focus on children between the ages of 7 and 9 enrolled in an elementary school. These children are at an age when they are learning to engage with more structured classroom activities and receive regular feedback from teachers, making them an ideal group for this study.

Participant selection method A purposive sampling method will be used to select participants. A local elementary school will be approached to participate in the study. The researcher will work with the school administration and teachers to identify one or two classrooms that are suitable for observation. The focus will be on classrooms where the teacher regularly provides feedback to students during classroom activities. All students within the selected classroom(s) will be observed, provided that parental consent and child assent are obtained.

Procedure

- 1 **Pre-observation meetings:** The researcher will meet with the selected teachers and school administration to explain the study and ensure the teachers understand the focus on feedback and its potential impact on students. This will help clarify any queries before the study starts.
- 2 **Observation period:** The researcher will observe the selected classrooms over a period of one week, for two hours per day, during regular classroom activities. The focus will be on periods when the teacher is actively giving feedback to students, such as during class discussions, group work or individual activities. The researcher will sit unobtrusively at the back of the classroom, making no contact or intervention with the teacher or students.
- 3 **Data collection:** Data will be collected by recording detailed field notes. The researcher will specifically observe and record: instances of teacher feedback (for example, positive, neutral and corrective); the type of feedback (for example, verbal, written and non-verbal); the children's immediate responses to feedback; and changes in engagement and participation before and after receiving feedback (for example, increased focus, raised hands and participation in group activities).

Data analysis method The data analysis will follow a qualitative approach, using thematic analysis to identify patterns in how teacher feedback influences children's engagement and participation. The field notes will be coded based on recurring behaviors, such as types of feedback and corresponding student reactions. Essential themes will be drawn from the data, including:

- the types of feedback that result in increased engagement (praise, constructive criticism, etc.)
- the immediate impact of feedback on children's participation (increased participation, improved task focus, etc.)
- variations in how different children respond to feedback (for example, differences based on personality or previous performance).

In addition to thematic analysis, frequency counts will be used to quantify the occurrence of specific types of feedback and the number of engagement instances that follow feedback. This mixed-method approach will provide both qualitative depth and some quantitative insights into the relationship between teacher feedback and student engagement.

HL extensions

The role of culture in shaping human behavior in the context of human development

Note: You should be able to discuss and explain how culture can affect human development in some way. This is one example of how culture can have an effect on human development. You are not required to learn this material for an examination.

Culture plays a pivotal role in shaping human behavior throughout the course of development, influencing everything from values and beliefs to social interactions and identity formation. Human development is deeply embedded in cultural context, as culture provides the framework through which individuals interpret their experiences, understand relationships and make decisions. Psychologists study culture by examining its multiple layers, including local culture (the norms, practices and behaviors specific to a community), cultural traditions passed down through generations (enculturation), and the broader impact of global culture (the ways in which globalization shapes behavior and identity). Cultural influences can be seen in how people approach education, work, family dynamics and personal growth across different stages of life. For example, individualistic cultures may emphasize personal achievement and autonomy, while collectivist cultures prioritize community and family responsibilities, each shaping distinct pathways of human development.

One of the key challenges in studying the role of culture in human development is operationalizing cultural variables and understanding how they influence behavior. Cultural differences manifest in complex ways that are difficult to isolate and measure, and researchers must be cautious of overgeneralizing cultural norms. For instance, the assumption that individuals in collectivist cultures always prioritize group harmony may overlook significant variations in individual behavior and personal aspirations within that culture. This issue, known as the ecological fallacy, underscores the need to recognize individual differences even within broadly defined cultural groups. Additionally, researchers face the challenge of capturing cultural dynamics that change over time due to factors such as migration, technological advancement and global cultural exchange.

CONCEPT: Bias

Bias is the distortion or misinterpretation of findings due to the researcher's assumptions, beliefs or methodological errors, which may lead to inaccurate conclusions. Researcher bias, particularly imposed etic bias, is a significant concern in the study of culture and human development. This occurs when researchers apply their own cultural frameworks to another culture, which can lead to inaccurate conclusions. For example, using more individualistic cultures' concepts of independence and personal agency to assess development in a more collectivist context may miss key cultural values such as interdependence and community responsibility, which are central to development in collectivist societies. The importance of considering cultural specificity in research is critical, as assumptions made from one cultural perspective may not fully capture the experiences and developmental trajectories of individuals in different cultural contexts.

Cultural influences on development also extend to areas such as language acquisition, moral reasoning and emotional regulation. The way children are socialized to express emotions, learn language or approach problem-solving varies widely across cultures, influencing cognitive and emotional development. Globalization further complicates these dynamics by introducing hybrid cultural identities and blending traditional values with global norms. As technology, media and migration increase cultural exchanges, understanding how these global influences interact with local traditions becomes increasingly important in studying human behavior.

Culture profoundly shapes human behavior and development by providing the lens through which individuals interpret their world and navigate life transitions. However, understanding the role of culture in development requires careful consideration of cultural variability, avoiding overgeneralizations and being mindful of potential researcher biases. As globalization continues to influence how cultures evolve and interact, research must adapt to explore how cultural contexts shape behavior across diverse populations and developmental stages.

CONCEPT: Perspective

Culture shapes a person's *perspective* by affecting how they interpret the world, make decisions and interact with others. For example, while people from collectivist cultures may prioritize group harmony, assuming that this perspective applies uniformly to all individuals can overlook personal aspirations or variations within the same culture. This highlights the importance of recognizing diverse perspectives even within cultural groups.

Key study

Shahaeian et al. (2014)

Aim Shahaeian et al. (2014) aimed to contrast and compare the sequence through which Western and non-Western children develop a theory of mind (ToM).

Background Over the past 30 years, researchers have put significant effort into studying how and when children begin to understand the minds of others. Multicultural studies help to identify which parts of this cognitive development are universal and which are influenced by culture. However, the research in this area is limited and lacks a clear, organized approach.

Participants A total of 164 children aged 3 to 9 participated in the study, with 80 children (47 girls, 33 boys, with an average age of 74.8 months) from Shiraz, Iran, and 84 children (43 girls, 41 boys, with an average age of 73.5 months) from Brisbane, Australia. All Iranian children spoke only Farsi and were born in Iran, while all Australian children spoke only English and were born in Australia. The children were recruited through invitation letters sent to parents via preschools, schools and email lists, targeting middle- to upper-class families in both cities. Parental consent was obtained for all participants. The average sibling age was 6.6 years for Iranian children and 6.2 years for Australian children.

Method In Iran, children were tested individually in a quiet room at their preschool or school, with a teacher or familiar member of staff present. In Australia, testing took place in child development test rooms at a university, with a parent present. Most tasks were translated to Farsi and then back-translated to ensure they matched the English version. The order of tasks followed the reported difficulty level for each country, with

the Sarcasm task being last. A pilot study was conducted in Iran for the Diverse Beliefs task, because owning a pet cat (the original scenario) is uncommon there. Instead, culturally familiar alternatives, like a man looking for his wife, or a boy searching for his shoes, were tested. Results from forty-two 4- to 5-year-old children showed no difference between the three versions, so the original version of the Diverse Beliefs task (the boy and the lost cat) was used for both cultural groups. All tasks were similarly administered in both countries. Testing took around 15 to 20 minutes for each child.

The tasks:

- 1 **Diverse Desires task:** Children are asked to understand that two people can have different desires or preferences about the same object or situation.
- 2 **Diverse Beliefs task:** Children must recognize that others may hold different beliefs about the same situation. The task involves a story about a boy who lost his cat, testing the child's ability to understand differing beliefs.
- 3 **Knowledge Access task:** This task assesses whether children can understand that someone else may not have access to information that they do, testing the child's ability to realize when others lack specific knowledge.
- 4 **Hidden Emotion task:** Children are asked to identify if someone is hiding their true emotions, followed by a "why" question to explore their understanding of emotional concealment.
- 5 **False Belief task:** Instead of the original "Surprise Contents task", children are tested on their ability to understand that someone will look for an object where it was last seen, even if it has been moved without their knowledge.
- 6 **Sarcasm task:** Children are tested on their ability to detect sarcasm in speech, requiring them to understand the difference between literal and non-literal language.

Findings/results Cross-cultural comparisons by task:

Source 1 (Table 3.12) shows the number and percentages of children who passed each test:

Task	Total	
	Iran, n = 80 (%)	Australia, n = 84 (%)
Diverse Desires	69 (86)	82 (97)
Diverse Beliefs	36 (45)	73 (87)
Knowledge Access	75 (94)	69 (82)
False Belief	46 (57)	48 (57)
Hidden Emotion	39 (48)	34 (40)
Sarcasm	21 (26)	8 (9)
Mean total ToM	3.63	3.83

Table 3.12 Source 1.

There was no significant difference in overall ToM scores between the Iranian ($M = 3.63$) and Australian ($M = 3.83$) children. However, more Australian children passed the Diverse Desires and Diverse Beliefs tasks, while significantly more Iranian children passed the Knowledge Access task. On the False Belief and Hidden Emotion tasks, children from both cultures performed similarly. As expected, more Iranian children succeeded in the Sarcasm task. These findings align with previous research, where Iranian children performed better on Knowledge Access but struggled with Diverse Desires and Diverse Beliefs.

Source 2 (Table 3.13) shows the number and percentages of children who passed each task in both countries based on age groups: (M = Mean, SD = Standard Deviation)

Task	3- to 5-year-olds		5- to 7-year-olds		7- to 9-year-olds	
	Iran, <i>n</i> = 22 (%), M (age) = 50.95, SD = 6.58	Australia, <i>n</i> = 25 (%), M (age) = 47.32, SD = 7.24	Iran, <i>n</i> = 32 (%), M (age) = 69.93, SD = 5.33	Australia, <i>n</i> = 37 (%), M (age) = 73.27, SD = 6.83	Iran, <i>n</i> = 26 (%), M (age) = 101.19, SD = 10.21	Australia, <i>n</i> = 22 (%), M (age) = 102.18, SD = 9.41
Diverse Desires	19 (86)	24 (96)	27 (84)	36 (97)	23 (88)	22 (100)
Diverse Beliefs	6 (27)	20 (80)	15 (47)	31 (84)	15 (57)	22 (100)
Knowledge Access	19 (86)	12 (48)	31 (97)	35 (95)	25 (96)	22 (100)
False Belief	4 (18)	10 (40)	24 (75)	24 (65)	23 (88)	22 (100)
Hidden Emotion	3 (14)	1 (4.2)	16 (50)	13 (35)	20 (77)	20 (90.9)
Sarcasm	2 (9)	0 (0)	7 (22)	2 (5)	12 (47)	6 (27.3)
Mean (SD) total ToM	2.45 (0.73)	2.37 (0.82)	3.47 (1.32)	3.83 (0.92)	4.53 (1.55)	5.00 (0.61)

Table 3.13 Source 2.

There were no gender differences in task performance or overall ToM scores for either cultural group. To better understand age-related differences, the sample was divided into three age groups: 3–5 years, 5–7 years and 7–9 years, based on school transition milestones. The results showed that for the youngest group (3–5 years), more Australian children passed the Diverse Beliefs task, while more Iranian children passed the Knowledge Access task. For the 5–7 age group, Australian children continued to do better on Diverse Beliefs, but more Iranian children passed the Sarcasm task. For the oldest group (7–9 years), the Australians still outperformed the Iranians on Diverse Beliefs, but performance on other tasks was similar across both cultures. Overall, there were no gender differences in any age group, and both cultures had similar ToM scores across all ages.

This study analyzed the developmental sequence of ToM tasks for children in Iran and Australia. It found that 83 percent of Australian children followed the expected sequence of mastering ToM tasks, from easiest to hardest, while 62 percent of Iranian children did the same, but in a different order. Australian children typically mastered Diverse Beliefs before Knowledge Access, while Iranian children did the opposite. The results confirmed that understanding sarcasm is the most challenging ToM task for both groups, supporting previous research. The statistical analysis showed that the progression of ToM tasks is consistent and reliable in both cultures, though the order of mastery differs between the two countries.

Source 3 shows the results:

1. Age effect on Theory of Mind (ToM)

Significant positive correlation between age and total ToM scores for both groups:

- Iranian children: $r = .59, p < .001$
- Australian children: $r = .85, p < .001$

Note: The “r” number refers to Pearson’s “r”. It is the correlation coefficient, which measures the strength and direction of the correlation between age and ToM scores. The “r” value (.59) for the Iranian children indicates a moderate positive correlation. This means that as the children’s ages increase, ToM scores increase. The “r” value of .85 for the Australian children indicates a stronger positive correlation, showing a stronger relationship between age and ToM scores.

The “p” value (p-score) shows the probability that the observed correlation between age and ToM scores occurred by chance. A “p” value of less than .001 ($p < .001$) means there is less than a 0.1% probability that the observed correlation is due to random chance. Such a low p-score means there is a high level of statistical significance to the correlation result. This means the results are very likely to show a genuine relationship between age and ToM scores for both the Iranian and Australian children because the p-scores are much lower than the generally-accepted significance threshold of .05.

2 Parental education

No significant correlation between parents’ education and ToM scores for either group.

- Iranian children: $r = .05$, $p = .67$
- Australian children: $r = .14$, $p = .18$

3 Effect of siblings

For Australian children, having siblings aged 1–12 years was significantly associated with higher ToM scores ($r = .25$, $p < .01$).

For Iranian children, the number of siblings had no significant effect on TOM scores ($r = .11$, $p = .35$). This result for Iranian children may be due to the limited variation in sibling numbers within the sample.

Conclusions This study found clear differences in how Iranian and Australian children acquire ToM concepts, with each group following a pattern that aligns with their cultural and epistemological context. These findings highlight the importance of including participants from diverse cultures in psychological research to avoid interpreting cultural development norms as universal. Without cross-cultural data, our understanding of global patterns in ToM development remains incomplete.

HL practice questions

- 1 Explain one issue that limits the interpretation of the data in Source 1.
- 2 Analyze the findings from Source 2 and state a conclusion linked to the claim that culture can shape human behavior in the context of human development.
- 3 Choose **one** of the following:
 - i. Discuss how the researcher could improve the credibility of the findings.
 - ii. Discuss how the researcher could avoid bias.
 - iii. To what extent are the findings transferable to other populations or contexts?
- 4 To what extent can we conclude that culture may have a positive effect on human development. In your answer, use your own knowledge and at least two of Sources 1–3.

The role of motivation in shaping human behavior in the context of human development

Note: You should be able to discuss and explain how motivation can affect human development in some way. This is one example of how motivation can have an effect on human development. You are not required to learn this material for an examination.

Motivation plays a crucial role in shaping human behavior and driving actions, both consciously and unconsciously, throughout the stages of human development. It influences how individuals pursue goals, overcome challenges and adapt to various life stages. In the context of human development, motivation can be categorized into primary and secondary forms. Primary motivation is associated with basic needs, such as hunger, thirst and safety, which are essential for survival and physical well-being. These fundamental drives are deeply rooted in biological processes and can be observed across all stages of life. For example, a child's motivation to seek nourishment is essential for growth, while an adult's drive for safety is critical for long-term stability. Meeting these primary needs supports physical development and lays the groundwork for higher-level motivational pursuits.

Secondary motivation encompasses more complex and socially driven goals, such as the desire for achievement, autonomy and social connection. These motives become more pronounced as individuals grow and are shaped by external influences, such as family, peers and societal expectations. In human development, secondary motives drive behaviors related to education, career choices, relationships and personal growth. For instance, an adolescent's motivation to perform well in school may stem from a desire for academic success or peer approval. Understanding these secondary motives is essential for examining how individuals navigate developmental milestones and make decisions that impact their future.

Motivation is further divided into intrinsic and extrinsic types, both of which play significant roles in human development. Intrinsic motivation arises from internal satisfaction and personal interest, often driving behaviors that align with an individual's goals or passions. For example, a child may be intrinsically motivated to explore their environment, driven by curiosity and a desire to learn. As they grow, this intrinsic motivation can fuel the pursuit of personal goals, such as mastering a skill or achieving self-fulfillment. In contrast, extrinsic motivation is influenced by external factors, such as rewards, praise or societal expectations. For instance, a teenager may be motivated to excel in sports due to parental encouragement or the prospect of receiving accolades. While both types of motivation shape behavior, intrinsic motivation is often associated with more sustained and meaningful engagement in developmental tasks.

CONCEPT: Change

The concept of *change* is closely linked to motivation, as shifts from extrinsic to intrinsic motivators often drive personal growth and long-term development. As individuals develop greater autonomy and competence, intrinsic motivation fosters more meaningful and sustained engagement in their goals, enabling continuous adaptation and positive change across various life stages.

Self-determination theory offers valuable insights into how intrinsic motivation drives human development by emphasizing the importance of fulfilling psychological

needs such as autonomy, competence and relatedness. When people feel in control of their actions, capable of achieving goals, and connected to others, they are more likely to experience positive developmental outcomes. This is particularly relevant in educational and social contexts, where fostering intrinsic motivation can lead to greater perseverance, creativity and personal growth. In contrast, over-reliance on extrinsic motivators, such as external rewards or punishments, may hinder the development of self-regulation and intrinsic goal setting, which are critical for long-term success.

Understanding motivation in human development is important for examining how people grow, adapt and make choices throughout their lives. Research shows that intrinsic motivation, particularly in educational and personal development, leads to greater resilience, emotional well-being and the pursuit of long-term goals. Motivation is a driving force that not only influences immediate behavior but also shapes the developmental trajectory of people as they navigate various life stages and challenges.

Key study

Józsa et al. (2019)

Aim The study aimed to understand the relationship between parenting styles, motivation and academic success in Hungarian adolescents, with a particular focus on how parental support can mitigate the decline in motivation often observed during the adolescence phase of human development. The goal was to understand how parenting influences adolescents' mastery motivation, a crucial driver of their development as learners.

Background Research shows that motivation to master challenging tasks is a key factor in academic success during the adolescence stage of development. However, motivation tends to decline as children transition into adolescence, affecting their development as learners. Since parenting plays a vital role in shaping motivation, this study investigates how different parenting approaches affect adolescents' motivation for learning, with the goal of identifying strategies to support ongoing academic achievement during this developmental period.

Method The study used a survey to collect data on parenting styles and motivation. Both adolescents and their mothers completed questionnaires that assessed various parenting factors (such as care/warmth, support for volitional functioning and encouragement of independence) and the adolescents' motivation for learning.

Participants 296 Hungarian adolescents and their mothers provided ratings on parenting factors and the youths' motivation for learning in relation to their engagement with challenging learning tasks.

Method Surveys were administered to both the adolescents and their mothers, including measures of:

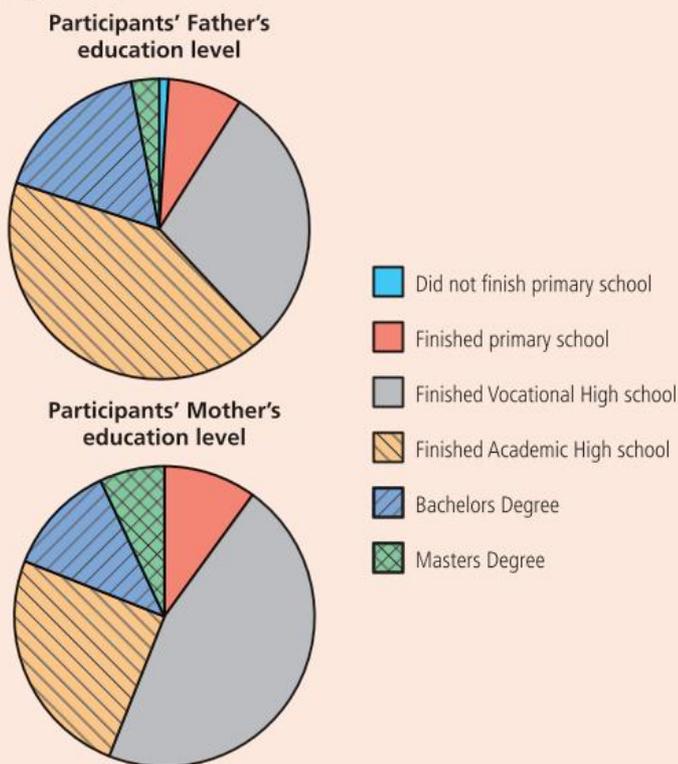
- parenting factors, such as care/warmth, support for volitional functioning (a person's ability to make choices and decisions based on their own preferences) and encouragement of independence, as rated by both parties
- mastery motivation, referring to the adolescents' motivation to persist in challenging tasks, rated by both the youths and their mothers
- school grades, used to operationalize learning and correlate with motivational factors.

Ethical considerations

- Informed consent was obtained from participants and their parents.
- Confidentiality was maintained to ensure all data remained anonymous and protected.
- Participants were informed that they could leave the study at any time without penalty.
- The researchers ensured participants' safety and respect throughout the research process.

Findings/results The results highlighted that parental care/warmth and volitional support were significantly associated with higher levels of mastery motivation, which directly affected academic achievement.

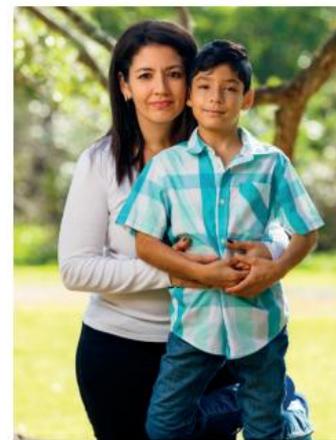
Source 1 (Figure 3.26)



▲ **Figure 3.26** Students' distribution based on the parents' level of education (%).

Source 2 shows parenting styles influencing adolescent motivation:

Józsa et al. (2018) studied 296 Hungarian seventh graders and their mothers and concluded that parenting plays an important role in developing motivation and achievement. Maternal support for volitional autonomy, i.e. teenagers making their own decisions, and parental warmth, are strongly associated with greater mastery motivation in children, as reported by both mothers and youths.



▲ **Figure 3.27** Do you think it was a limitation or a strength that the study only focused on maternal parental styles?

Source 3 outlines Józsa et al.'s findings:

- Adolescent-rated parental care/warmth predicted the adolescents' motivation to engage in learning, which in turn improved school performance.
- Similarly, mother-rated parental care/warmth predicted maternal assessments of motivation, which also positively influenced academic outcomes.
- Adolescent-rated encouragement of independence influenced mother-rated motivation and had both direct and indirect effects on school success/learning.
- Mother-rated volitional support was predictive of both adolescent and mother assessments of motivation, leading to better academic performance.

Conclusion The study concluded that parenting factors such as care, warmth and volitional support are essential in fostering mastery motivation in adolescents, which in turn promotes academic success. The findings underscored the importance of considering both adolescent and parental perspectives when evaluating the influence of parenting on motivation. Interventions aimed at enhancing parental support and warmth may help sustain adolescents' motivation, thus supporting their ongoing development as learners.

HL practice questions

- 1 Explain one issue that limits the interpretation of the data in Source 1.
- 2 Analyze the findings from Source 2 and state a conclusion linked to the claim that motivation can shape human behavior in the context of human development.
- 3 Choose **one** of the following:
 - i. Discuss how the researcher could improve the credibility of the findings.
 - ii. Discuss how the researcher could avoid bias.
- 4 To what extent can we conclude that motivation may have a positive effect on human development? In your answer, use your own knowledge and at least two of Sources 1–3.

The role of technology in shaping human behavior in the context of human development

Note: You should be able to discuss and explain how technology can affect human development in some way. This is one example of how technology can have an effect on human development. You are not required to learn this material for an examination.

The rapid advancement and widespread use of technology – including smartphones, social media, video games and AI – has significantly influenced human behavior and development. Technology now shapes the way individuals communicate, learn, work and interact with their environments, from childhood through adulthood. While technology provides many benefits, such as enhancing learning opportunities, promoting social connectivity and offering access to information, it also presents challenges that impact cognitive, emotional and social development across the lifespan.

One major difficulty in studying the effects of technology on human development is the difficulty of isolating its influence from other developmental factors. For instance, while video games can enhance problem-solving skills, they may also contribute to reduced attention spans, making it difficult to determine whether technology use alone is responsible for these changes or other environmental factors play a role. Similarly, the use of educational apps or online platforms can promote cognitive development in children, but distinguishing the specific contributions of technology from parental involvement, quality of education and socioeconomic status can be challenging.

CONCEPT: Causality

The concept of *causality* is central to understanding the role of technology in human development, as it is often difficult to isolate the direct effects of technology from other influencing factors. Determining whether changes in behavior, such as improved problem-solving skills or reduced attention spans, are caused solely by technology use or are the result of a combination of factors like parental involvement or socioeconomic conditions is a key challenge in establishing clear causal relationships.

Another issue faced by researchers is the variability in technology use across different age groups and cultural contexts, which can lead to sampling *biases*. Many studies focus on younger populations, such as adolescents or college students, who are often more tech-literate and frequent users of social media and digital platforms. This can lead to an overrepresentation of certain demographic groups, limiting the generalizability of findings to older adults or individuals in less technologically integrated regions. As a result, drawing broader conclusions about the impact of technology on development across all age groups and cultural contexts remains difficult.

A key consideration in understanding the role of technology in shaping human behavior is the bidirectional nature of its influence. For example, while excessive screen time may negatively affect social skills or emotional regulation in children, it is equally possible that children who already struggle with these issues are more likely to use technology as a coping mechanism. This bidirectional ambiguity makes it difficult to determine whether technology is the cause or consequence of certain developmental outcomes. This complicates efforts to draw clear, causal conclusions.

Furthermore, researcher bias and funding sources can impact the interpretation of findings in this field. Studies that are sponsored by technology companies may focus on the positive aspects of technology use, such as how it enhances learning or facilitates social interactions, while research funded by health organizations may emphasize potential harms, such as increased screen time contributing to anxiety or developmental delays. This selective focus can skew public understanding of the effects of technology on development, emphasizing one side of the argument while overlooking others.

The relatively new nature of research on technology and human development presents additional challenges. Given the pace at which technology evolves, many studies may become outdated before findings are fully replicated or validated. This is particularly relevant in areas such as social media use or AI, where new features or platforms rapidly change the way people interact with these technologies. Replication and methodological rigor are essential for drawing reliable conclusions, but the rapid changes in technology require constant adaptation from researchers.

In conclusion, while technology plays an undeniable role in shaping human behavior throughout development, understanding its full impact requires navigating several challenges. These include sampling bias, bidirectional influences, researcher bias and the need for continuous methodological rigor in light of evolving technologies. As technology becomes even more embedded in daily life, future research must adapt to provide comprehensive insights into how technology influences cognitive, emotional and social development across diverse populations.

Key study

Cristia et al. (2017)

Aim Cristia et al. (2017) aimed to evaluate the impact of the One Laptop per Child (OLPC) program through a large-scale randomized trial, using data collected over 15 months from 319 elementary schools in rural Peru, to assess its effects on academic achievement and cognitive development in children.

Background The OLPC program aims to enhance learning in impoverished areas by providing school children with laptops for use in school and at home. Since its inception, the program has been implemented in 36 countries, distributing over two million laptops. Despite the significant investments (each laptop costs about \$200), there is minimal evidence of the program's effectiveness in improving learning outcomes. This study aimed to address this lack of information by conducting a large-scale randomized evaluation of OLPC in 319 public schools in rural Peru, where the program has been implemented on a large scale. The study investigated whether increased access to laptops affected academic achievement in mathematics and language, as well as cognitive development, measured through tasks such as Raven's Progressive Matrices and verbal fluency tests. Given existing research linking computer use to improved cognitive skills, this study explored the possible impact of laptops on both children's academic performance and their general cognitive abilities.

Source 1 (Table 3.14 below and continued on the next page) shows all schools in Peru in which instruction is performed in Spanish and which have more than four students enrolled in second grade. Column (1) includes all schools in Peru. Column (2) focuses on schools prioritized by the government for the OLPC intervention. Columns (3) and (4) include the original research sample and the final research sample, respectively.

	All (1)	Prioritized for intervention (2)	Original research sample (3)	Final research sample (4)
Panel A: Data from the 2007 school census				
<i>Type, Location</i>				
Rural	0.380	0.955	0.933	0.927
Private	0.190	0.005	0.004	0.000
Multigrade	0.222	0.864	0.919	0.940
One-teacher	0.056	0.101	0.044	0.012
Bilingual	0.074	0.236	0.098	0.000
Years opened	27.766	23.948	24.670	24.186
Coastal region	0.486	0.082	0.099	0.018
Andean region	0.371	0.837	0.777	0.804
Jungle region	0.144	0.080	0.124	0.178

	All (1)	Prioritized for intervention (2)	Original research sample (3)	Final research sample (4)
Panel A: Data from the 2007 school census				
<i>Students</i>				
Enrollment	111.715	51.208	64.374	65.384
Overage	0.338	0.496	0.492	0.467
Native language Indigenous	0.190	0.479	0.358	0.269
Repetition rate fourth grade	0.081	0.112	0.106	0.099
Drop-out rate fourth grade	0.042	0.065	0.065	0.070
<i>Teachers</i>				
Number of teachers	13.539	3.204	3.431	3.419
<i>Services</i>				
Running water	0.678	0.455	0.506	0.583
Sewage	0.714	0.396	0.438	0.446
Electricity	0.744	0.804	0.822	0.844
Library	0.490	0.268	0.295	0.334
<i>Technology access</i>				
Any computer	0.597	0.352	0.393	0.452
Computer lab	0.445	0.081	0.109	0.147
Number of computers	10.566	1.001	1.293	1.668
<i>N</i>				
Schools	36,037	1,909	741	320
Students	4,025,877	97,757	47,701	20,923

▲
Table 3.14 Source 1.

Method This study employed a randomized-controlled trial (RCT) at the school level, as the OLPC program was implemented at this level. Schools were randomly assigned to either the treatment group, which received laptops, or the control group, which did not. Randomization was stratified by region, the proportion of over-age students and school size to ensure a balanced distribution. The study focused on comparing the outcomes between the treatment and control groups to evaluate the impact of the OLPC program on academic achievement and cognitive development.

Participants The participants were selected from a pool of 1,909 public, rural, multigrade schools prioritized by the government, all located in the poorest districts and with access to electricity. The initial sample was reduced to 741 schools, which had administrative data and test scores available from previous years (2005–07). Further reductions were made to the sample by excluding one-teacher schools and schools where the language of instruction was not Spanish, and focusing on schools in the eight largest regions with at least 80 percent OLPC coverage. This final sample included 319 schools, with 209 assigned to the treatment group and 110 to the control group.

Procedure Data collection took place in October and November 2010, approximately 15 months after the OLPC program's implementation. The study focused on academic achievement and cognitive skills in students from three groups: second graders, students who took the second-grade national standardized exam in 2008 and sixth graders. Five students from each group were randomly selected for testing in each school.

Achievement tests in mathematics and reading were administered using items from previous national standardized exams, while cognitive skills were assessed using Raven's Progressive Matrices (to measure non-verbal abstract reasoning), a verbal fluency test (measuring executive function and vocabulary) and an adapted coding test from the Wechsler intelligence test (measuring working memory and processing speed). Cognitive measures were standardized separately for each student group.

Laptop usage logs were extracted from 76 percent of the children's laptops to determine usage patterns. Personal interviews were conducted with students and their caregivers to gather sociodemographic data and computer-usage habits. Non-cognitive outcomes, such as motivation and self-perceived competence, were measured through questionnaires. Teachers and school directors also completed questionnaires to provide information on computer access and usage at school.

Findings/results The study found that increased access to laptops did not have a significant effect on academic achievement in mathematics and language. Small standard errors allowed researchers to rule out even modest effects, indicating that the OLPC program did not lead to measurable improvements in these subjects. This is consistent with previous studies on technology in education, which have similarly found no significant impacts on test scores in core academic areas.

Source 2 (Table 3.15) shows the effects on computer access and use – interviewed sample:

	Treatment (1)	Control (2)	Raw difference (3)	Adjusted difference (4)	N (5)
<i>Access</i>					
School has computers	0.986	0.545	0.440 (0.048)	0.418 (0.048)	318
Computers per student at the school	1.178	0.118	1.060 (0.043)	1.046 (0.046)	313
Student has a computer	0.874	0.090	0.784 (0.028)	0.782 (0.027)	2,619
<i>Use</i>					
Used a computer last week	0.843	0.319	0.524 (0.044)	0.518 (0.041)	2,612
Used a computer at school last week	0.819	0.264	0.556 (0.045)	0.550 (0.042)	2,612
Used a computer at home last week	0.418	0.038	0.380 (0.030)	0.391 (0.031)	2,612
Used a computer in a private center last week	0.072	0.081	-0.009 (0.019)	-0.008 (0.018)	2,612
Ever used internet	0.177	0.114	0.063 (0.024)	0.065 (0.023)	2,607

Table 3.15 Source 2.

Source 2 shows estimated differences between the treatment and control groups at the school and student level. Statistics at the student level are calculated including those from the interviewed sample. Columns (1) and (2) present means, and columns (3) and (4) present estimated coefficients and standard errors.

The study found positive effects on cognitive skills. Statistically significant improvements were observed in Raven's Progressive Matrices, with smaller but positive effects in the verbal fluency and coding tests. The magnitudes of these effects ranged from 0.09 to 0.13 standard deviations, indicating an overall

improvement in general cognitive skills. When combining the results into a cognitive skills index, the improvement was equivalent to approximately 5.1 months of expected progression over the 15-month period of the study.

Source 3 (Table 3.16) shows the effects on behavior and non-cognitive outcomes – interviewed sample:

	Treatment (1)	Control (2)	Raw difference (3)	Adjusted difference (4)	N (5)
<i>Behavior</i>					
Enrollment	55.874	56.538	-0.663 (3.651)	-1.754 (2.514)	313
Attendance	0.800	0.761	0.039 (0.020)	0.024 (0.019)	4,981
Studied at home less than one hour daily last week	0.334	0.342	-0.008 (0.034)	-0.010 (0.031)	2,618
Studied at home one to two hrs daily last week	0.514	0.497	0.018 (0.032)	0.017 (0.032)	2,618
Read a book last week	0.782	0.811	-0.030 (0.029)	-0.017 (0.027)	2,612
<i>Non-Cognitive Outcomes</i>					
Intrinsic motivation index	0.846	0.856	-0.010 (0.006)	-0.009 (0.006)	2,617
Self-perceived school competence index	0.791	0.807	-0.017 (0.010)	-0.021 (0.010)	2,615

Table 3.16 Source 3.

Source 3 shows findings/results for the treatment and control groups. Statistics for hours of study, reading and motivation measures are calculated from students in the interviewed sample. Statistics for attendance are generated focusing on all students in the followed cohort and sixth grade. Columns (1) and (2) present means, and columns (3) and (4) present estimated coefficients and standard errors.

Source 4 (Table 3.17) shows the effects on academic achievement and cognitive skills:

	Treatment (1)	Control (2)	Raw difference (3)	Adjusted difference (4)	N (5)
<i>Academic achievement</i>					
Math	0.062	0.000	0.062 (0.070)	0.046 (0.061)	4,111
Language	-0.030	0.000	-0.030 (0.065)	-0.039 (0.057)	4,098
Average academic achievement	0.016	0.000	0.016 (0.064)	0.003 (0.055)	4,096
<i>Cognitive skills</i>					
Raven's Progressive Matrices	0.119	0.000	0.119 (0.065)	0.112 (0.057)	4,110
Verbal fluency test	0.156	0.000	0.156 (0.101)	0.134 (0.090)	4,110
Coding test	0.103	0.000	0.103 (0.103)	0.086 (0.097)	4,108
Average cognitive skills	0.125	0.000	0.125 (0.068)	0.110 (0.060)	4,100

Table 3.17 Source 4.

Source 4 shows statistics and estimated differences between the treatment and control groups. The sample includes students in second grade, the followed cohort and sixth grade. Columns (1) and (2) show means, and columns (3) and (4) show estimated coefficients and standard errors.

The results showed that the positive effects on cognitive skills were consistent even when accounting for timing issues in test administration.

Conclusions This study found that while the OLPC program significantly increased computer use at school and home, it had limited effects on academic achievement in mathematics and language. The OLPC program did not boost academic achievement, although it had a significant effect on the development of general cognitive skills in the participating children. The findings suggest that while laptops alone may not enhance academic performance, they can improve cognitive abilities. To boost achievement in curricular areas, laptops should be integrated with high-quality instructional methods. Future research should focus on exploring the long-term effects of technology use on cognitive development and educational outcomes.

HL practice questions

- 1 Explain one issue that limits the interpretation of the data in Source 1.
- 2 Analyze the findings from Source 2 and state a conclusion linked to the claim that technology can shape human behavior in the context of human development.
- 3 Choose **one** of the following:
 - i. Discuss how the researcher could improve the credibility of the findings.
 - ii. Discuss how the researcher could avoid bias.
- 4 To what extent can we conclude that technology may have a positive effect on human development? In your answer, use your own knowledge and at least two of Sources 1–4.

[End of HL extension section]

Context: Human development Concept–Context practice questions

Bias

- 1 How might cognitive biases, such as confirmation bias or cultural bias, influence a researcher’s interpretation of developmental milestones in children across different cultures?
- 2 In what ways could gender bias in psychological research affect our understanding of social and emotional development during adolescence?
- 3 To what extent do sampling biases in studies of childhood brain development affect the generalizability of the findings across diverse populations?
- 4 How can a psychologist control for participant bias when studying the influence of critical periods in brain maturation, ensuring the validity of the research outcomes?

- 5 How might cognitive biases such as availability bias or anchoring bias impact a teacher's judgment about a child's developmental stage or needs, and how can this be mitigated?

Causality

- 1 How can researchers distinguish between correlation and causation when studying the influence of early attachment styles on later social relationships?
- 2 To what extent can the complexity of brain development during critical periods be attributed to multiple interacting variables, and how does this challenge reductionist approaches to understanding cognitive growth?
- 3 In studies examining the effect of socioeconomic status on cognitive development in early childhood, how do researchers control for extraneous variables to improve internal validity and establish causality?
- 4 What challenges arise in determining causal relationships between language development and social interaction in infancy, considering the bidirectional nature of these variables?
- 5 How might the use of a double-blind control in a longitudinal study of parenting styles help to establish a clearer cause-and-effect relationship between parenting behaviors and emotional development in children?

Change

- 1 How does planned change, such as educational interventions during early childhood, impact cognitive development over time, and what factors might resist such interventions?
- 2 In what ways do sudden changes, such as bereavement, interact with environmental factors to influence emotional development, and how might these changes be measured in longitudinal studies?
- 3 How do intrinsic motivations, such as a desire for self-improvement, affect the social development of adolescents, and how might resistance to change be explained in terms of cognitive development theories?
- 4 To what extent can unplanned changes, such as trauma or illness in early childhood, affect long-term brain maturation, and how do psychologists promote resilience in such cases?
- 5 How might a child's ability to manage stress, shaped by both environmental influences and personal agency, evolve as they develop, and what role does brain maturation play in this process?

Measurement

- 1 How can the operationalization of variables in a study on childhood brain maturation ensure both reliability and validity when using MRI imaging to track synaptic growth and neural pruning?
- 2 To what extent does the choice of research method (for example, longitudinal vs. cross-sectional studies) affect our understanding of critical periods in language acquisition and cognitive development during early childhood?
- 3 How might triangulation of research methods (for example, questionnaires, brain imaging and observational studies) enhance our understanding of the role of neuroplasticity during adolescence?

- 4 What are the strengths and limitations of self-reported data in understanding the influence of sociocultural factors on a child's social and emotional development?
- 5 How might indirect measurements, such as observational data of peer interactions, complement brain imaging studies in understanding the development of empathy and moral reasoning during middle childhood?

Perspective

- 1 How do biological, cognitive and sociocultural approaches to psychology help us understand the different stages of human brain maturation, and what role does neuroplasticity play in these stages?
- 2 To what extent does the sociocultural approach to psychology explain the influence of peers and family on a child's identity development during middle childhood and adolescence?
- 3 How might Vygotsky's concept of the ZPD be used to explain the cognitive development that occurs during brain maturation, particularly in early childhood?
- 4 How do different psychological models (for example, Piaget's and Vygotsky's) account for changes in human behavior and learning across various stages of development, and what are the implications for educational practices?
- 5 In what ways can attachment theory, particularly Bowlby's research on critical periods, be interpreted using the sociocultural perspective to explain emotional and social development in early childhood?

Responsibility

- 1 How do ethical considerations in psychological research, such as informed consent and protection from harm, influence our understanding of cognitive, social or moral development in children?
- 2 In what ways might the critical periods of brain development, such as language acquisition or social bonding, be influenced by socially responsible research practices, especially when studying sensitive populations like children or minorities?
- 3 How can the concept of neuroplasticity be ethically researched using vulnerable populations such as children, and what ethical guidelines are essential to ensure that the study maximizes benefits while minimizing harm?
- 4 To what extent do ethical responsibilities in research, such as reducing harm and avoiding stigma, impact the study of moral development across different cultures?
- 5 How might the use of animals or child participants in developmental psychology research be justified from an ethical standpoint, considering the long-term benefits to our understanding of human growth across cognitive and social domains?

Human relationships

Introduction to human relationships

Studying human relationships has its challenges, and it is tempting to oversimplify complex social and psychological issues. One approach to the study of human relationships concentrates on the role of hormones and genetics. However, this gives a limited understanding of how relationships develop. Cognitive theorists have also contributed to the understanding of relationships by applying schema theory, while social psychologists have focused on beliefs, social identity theory and the role of culture.



The notion of an ingroup ('us') being contrasted with an outgroup ('them' or 'the other') is a key notion underpinning social psychology.

However, it should be noted that groups are dynamic and represent social and personal constructions. For instance, an individual may perceive someone as belonging to several groups, whereas the individual may not identify with those groups or may have a different understanding of what those group labels mean. Overall, the key goals of social psychologists are to understand the complexities of relationships, improve interpersonal relationships, promote social responsibility, and reduce violence. As such, notions such as credibility and trustworthiness, as well as a consideration of ethics, are important throughout. Social psychologists who study human relationships have a responsibility to themselves, the profession and the individuals they work with to conduct their research and practice in an ethical manner. Acknowledging one's own perspective, demographics and background when conducting research is a way to counteract our own *biases* by engaging in epistemological reflexivity.



You can read more about ingroups and outgroups, in the context of social identity theory on pages 77–79.



Conceptual question

Human relationships deal with many constructs that are hard to *measure*, like love, aggression and culture. How might the approach to measuring data (for example, collecting qualitative or quantitative data), impact the findings of a study?

You should have an understanding of the areas of study in Table 3.18.



Group behavior

Area of study	Learning objectives
Acculturation	Different acculturation strategies and their effect on behavior and mental health.
Compliance techniques	The application of one or more compliance techniques to change group behavior(s).
Conformity	The role of conformity in understanding group behavior(s).
Cultural dimensions	The role of one or more cultural dimensions in understanding group behavior(s).
Social identity theory	The application of social identity theory to explain and change group behavior(s).
Social learning theory	The application of social learning theory to change group behavior(s).



Table 3.18 Group behavior learning objectives from Subject Guide, page 31.

Individuals belong to many groups and derive much of their identity from the behavior of other people within these groups. (For example, when your favorite sports team wins, you feel elated, even though the players' behavior was far removed from your own.) Psychologists investigating group behavior often study to what extent a person's behavior is influenced by membership of a group.

One of the most important groups we belong to is our culture or cultures, and the bidirectional relationship between our culture and our individual behavior is heavily researched in psychology. An increasing body of culturally informed research has made cross-cultural psychology, as well as cultural psychology, a contemporary topic of debate among psychologists working in the field. Theories, concepts and research studies provide the background for a more nuanced understanding of the variety and complexity of human behavior. This is important in the modern, globalized world where issues related to migration and integration are on the rise.

Acculturation

A large part of growing up and establishing our own identity is understanding our role within our culture and the socially acceptable ways to act within our group. This process of cultural learning is called enculturation (Figure 3.28).

Activity 97

Enculturation doesn't just happen on a national level; each group or institution has its own culture. What would new students entering your school learn about how to operate within your school culture? Work with the person next to you to write down three "unspoken rules" of your school culture that affect how students behave. For example, is there a specific place different year groups or social groups sit at lunch? Is there some slang terms that have specific meaning within the school? Is there an unwritten code about how people personalize their lockers/notebooks/devices or uniforms?

You can read more about enculturation on pages 73–74.



Figure 3.28 Australian children learn through interacting with adults around them that the word “barbie” most often refers to an outdoor cooking grill and not a doll as it does in the rest of the world.

Cultures are dynamic systems. They are constantly changing, interacting and developing, and this process is supercharged in our interconnected, globalized world (Figure 3.29). People belong to many cultures and often move from one culture to another, for example, by migrating to a new country or, on a smaller scale, by joining new groups (a new sports team, a new company, etc.). When people find themselves within a new culture, it can change their cognition and behavior. This process of changing one's thoughts or behaviors due to contact with a new culture is known as acculturation.

You can read more about acculturation on pages 75–77.



Figure 3.29 Finding one's place in a new culture is a complex endeavor.

Berry and Annis (1974) suggested that humans use one of four different acculturation strategies when they come into contact with additional cultural groups: assimilation, integration, separation and marginalization (Table 3.19). Assimilation is the abandonment of an individual's original culture and the adoption of the cultural norms and beliefs of their new culture. Integration is when an individual still values their original culture but is motivated and curious to adopt some aspects of the new culture. Separation is when new arrivals to a culture maintain their original culture and minimize contact with the new culture where possible. Lastly, marginalization is when it is no longer possible to maintain one's original culture, but the individual is faced with exclusion and/or discrimination from members of the new culture, which inhibits assimilation.

Berry and Annis's (1974) model outlines why it is important for individuals not only to maintain ties to their culture, but to balance this against lifestyle factors that can inhibit successful assimilation in the new culture.

		Positive Relationship with New Culture?	
		Yes	No
Important to Maintain Original Culture?	Yes	INTEGRATION	SEPARATION
	No	ASSIMILATION	MARGINALISATION

▲
Table 3.19 Berry and Annis's Acculturation Model.

Joining a new culture can produce all kinds of stressors for individuals, from not knowing the social "scripts" of how to buy groceries at the supermarket through to not seeing one's values reflected or respected in the media. This stress of living in a new culture is called **acculturative stress** and can result in physical and mental disorders. It is a burden that anyone who is not part of the dominant social group in a culture must live with on a daily basis.

Activity 98

Do all people think about color in the same way? Do you think all people "like" or think positively about colors such as green, yellow and blue? Discuss with your friends whether a person's culture affects the way they think about, or like or dislike, colors. Do you think people from cultures around the Mediterranean coast think about colors in the same way as people from Patagonia, Scandinavia or the Yukon? To what extent does this discussion reveal a person's assumptions about culture's effect on behavior (that is, whether people adopt a universalist or relativist perspective to studying behavior)? Are some things universal for all humans, or is their value relative to the cultural context they are found in.

Key study

Miranda and Matheny (2000)

Aim To investigate what factors could decrease acculturative stress for Latinx immigrants to the USA.

Method Two social service agencies were used as a sample of opportunity, and a random sample of 197 clients participated in this questionnaire study that looked at acculturative stress and coping strategies.

Results The study found that Latinx immigrants who had strong English language skills and a supportive family environment reported less acculturative stress. They also found that there was a negative correlation between years lived in the USA and acculturative stress.

Conclusions Miranda and Matheny concluded that supportive factors can mitigate the negative impacts of moving to a new culture, such as acculturative stress.

Critical thinking

It is often assumed that integration into a new culture is the desirable form of acculturation. However, if an individual faces constant prejudice and discrimination, this may not be possible, or even desirable. We are social animals and desire to belong to a group. However, if the group does not accept us, this state of not belonging can be a catalyst for social change, particularly against injustice.

If a culture does not allow for our own *perspective* to be seen and heard, it can be an empowering force to unite with those with similar views and push back against the dominant culture. It can be argued that many civil rights movements have been caused by a lack of ability of individuals to acculturate to a mainstream culture, not by any fault of their own, but because of discriminatory, resistant cultural structures.

This also raises issues of construct validity around successful acculturation. It is unclear from Berry's (1974) or any other model exactly what successful acculturation looks like.

Activity 99

Consider the situation a new family from a different culture faces when arriving in your neighborhood. Give three reasons why they might move to your area. List ten things that the family would find familiar and ten that would be unfamiliar. How can people in the host country help newcomers adapt and assimilate?

Researchers investigating culture must be aware of *biases* that can undermine their research findings. One example where bias can come into play is when materials must be translated and participant responses back-translated. For example, in Miranda and Matheny (2000), questionnaires had to be translated into Spanish and participants' responses translated back into English. This is also an ethical issue relating to the researcher's *responsibility* to their participants, ensuring the participants have been informed of the study and have willingly given consent to take part and are not taking part out of a sense of obligation. This is particularly important if researchers wish to study a vulnerable population such as undocumented migrants. One tool at psychologists' disposal to control for this is to engage in **response validation**, that is, to check with participants, or a subset of participants, that the meaning they intended to convey is what was captured by the researcher.

TOK

Can knowledge be separated from the values embedded in the process of creating it?



Conceptual question

Miranda and Matheny (2000) had to take extra care when translating their text to avoid *biases* in translation. What other biases might the researchers have considered when designing this study?

Activity 100

Try to meet someone who came into your cultural group some time ago, and discuss with them the process they went through to adapt/assimilate. (This may not necessarily be someone from another country.) What did they find most difficult about their acculturation process? What was not difficult? Did they have to learn a new language? How do they feel they have changed as a result of their acculturation?

Compliance techniques

Compliance is when an individual modifies their behavior in response to a direct request from another person (Figure 3.30). It often happens at a surface level, and results only in a temporary change in behavior to avoid punishment or to fit into a group; it doesn't usually result in a long-term change of perspective.

One prominent compliance technique in social psychology is the "foot-in-the-door" technique. This involves first getting a person to agree to a small request, which increases the likelihood that they will comply with a larger request later on. This technique relies on our desire to have a consistent self-image, so that once we have committed to the idea of something, we are invested in seeing it through.

Activity 101

Where might you see the use of compliance techniques around your school? Have you seen them used for positive purposes (such as encouraging people to recycle or turn off the lights) or with negative consequences (such as peer pressure)? Now that you know about compliance techniques, is it *responsible* to use them if you have positive aims? For example, if you are involved in a CAS project raising awareness for a cause, is it responsible to use compliance techniques to encourage people to attend an event you are organizing?

For example, Freedman and Fraser (1966) first asked homeowners if they would be willing to place a small sign supporting safe driving in their windows, then followed up the request with a large sign a few days later. Unsurprisingly, they found that those who were willing to put a small sign up were willing to put a large one up too.

You can read more about the foot-in-the-door technique on page 68.



Figure 3.30 An example of compliance is people slowing down to 2 kilometers per hour below the speed limit around the area where there is a known speed camera but reverting back to driving 5 kilometers per hour above the speed limit (or whatever the societal norm is) directly after.

Critical thinking

Compliance techniques, like conformity (see below), are neither a good or a bad thing; they are just an influence on human behavior and can be used to increase the likelihood that individuals do both societally beneficial and harmful acts. It is important for psychologists and individuals to think of their ethical *responsibility* when using these compliance techniques. Indeed, it raises the question of whether they should be used at all. These ethical questions do not stop corporations from using them, and if you pay attention to your experiences when watching ads, entering a supermarket, or trying to buy flat-pack furniture without buying a plate of meatballs, you will see them in use everywhere.

Acting ethically is an example of **psychological literacy**. Psychological literacy is the understanding of psychology and the application of problem-solving skills and psychological principles to real-life problems in different contexts. It also includes thinking critically, **cultural competence** and self-awareness.

Activity 102

Now that you understand the foot-in-the-door technique, how do you feel going into a supermarket knowing that compliance techniques are being used to encourage you to buy certain products? Is it fair for companies to take advantage of human nature in this way? Walk around a supermarket and note specific examples of compliance techniques. Do they have an impact on you?

TOK

What are the moral implications of possessing knowledge about human behavior?

Conformity

Conformity is the psychological phenomenon whereby individuals adjust their attitudes, beliefs or behaviors to align with the norms or standards of a group, often in response to real or perceived group pressure. It is a change in behavior when there is no direct request to do so. Conformity is a natural part of human experience and comes from a fundamental need to belong to a group, as humans are a social species. Conformity is neutral (neither inherently good nor bad) and can result in positive behaviors (such as everyone in an audience conforming to an individual's decision to rise to their feet to give performers a standing ovation at the theater) as well as negative behaviors (such as people feeling empowered to post hurtful comments online once a few negative comments have already been posted). Examples of conformity highlight the power of the situation in influencing our own individual behavior. Conformity levels are not universal across cultures; they vary accordingly to different cultural norms and values.

Key study

Berry (1967)

Aim To investigate cultural differences in conformity

Method Berry researched two subsistence cultures, the Temne (from Sierra Leone, who are agricultural and rely on rice and farming) and the Inuit of Baffin Island in Canada (who rely on hunting and fishing and are a more individualistic culture). He conducted experiments with participants from both cultures using the Asch line paradigm to see at what rate participants would conform.

You can read more about individualism and collectivism on page 71.



Results The study found that in the Temne culture, in which individuals relied on each other more closely, the culture was more collectivist and there were stricter behavioral norms. Conformity rates were much higher than in the Inuit sample, as the latter culture's food accumulation strategy is based on the more individualist pursuits of hunting and fishing, which do not require the same degree of interdependence as farming and agriculture do (Figure 3.31).

Conclusion Berry concluded that culture influences levels of conformity among individuals.

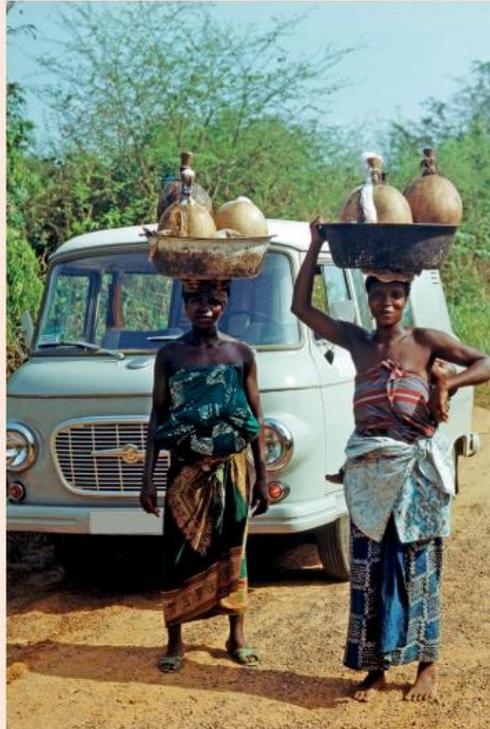


Figure 3.31 Cultural context can influence the way we relate to one another.

Critical thinking

Berry (1967) shows us that conformity is an adaptive human behavior and that conformity levels vary across cultures, as different cultures have different perspectives on social harmony and individual distinctiveness. This can be exemplified by contrasting the North American saying “the squeaky wheel gets the grease” (if you draw attention to yourself, you will get the assistance you require) with Japanese saying “the tall nail gets hammered down” (anybody that stands out from the group will be punished).

Berry's study was conducted a long time ago, and globalization has changed the way both the Inuit and Temne people live. This raises issues of temporal validity. We cannot be sure, if this study were repeated today, that the results would be the same. As globalization increasingly moves most cultures along the individualism vs. collectivism continuum towards individualism, it is likely that conformity levels are reducing globally.

Should key events in the historical development of the human sciences always be judged by the standards of their time?



Cultural dimensions

Culture is popularly defined by Hofstede (1980) as “the collective programming of the mind”. Cultural dimensions refers to the academic frameworks used to describe and compare the underlying values, behaviors and attitudes that differentiate cultures from one another. These dimensions provide insight into how societies prioritize various aspects of life and interaction, affecting communication, business practices, government policies and individual behavior. One cultural dimension is the individualist/collectivist dimension.

Activity 103

Discuss with your friends or family members their attitude toward honesty. Are there any situations where it is acceptable to be dishonest? Discuss their attitudes toward punctuality – why do you think some people think and behave as if absolute punctuality is essential for respectful living, while others have a more casual attitude toward arriving at events on time? To what extent does the discussion reveal cultural attitudes toward specific values?

A value is a subjective belief relating to a desirable outcome or behavior, and one that transcends specific situations.

In individualistic cultures:

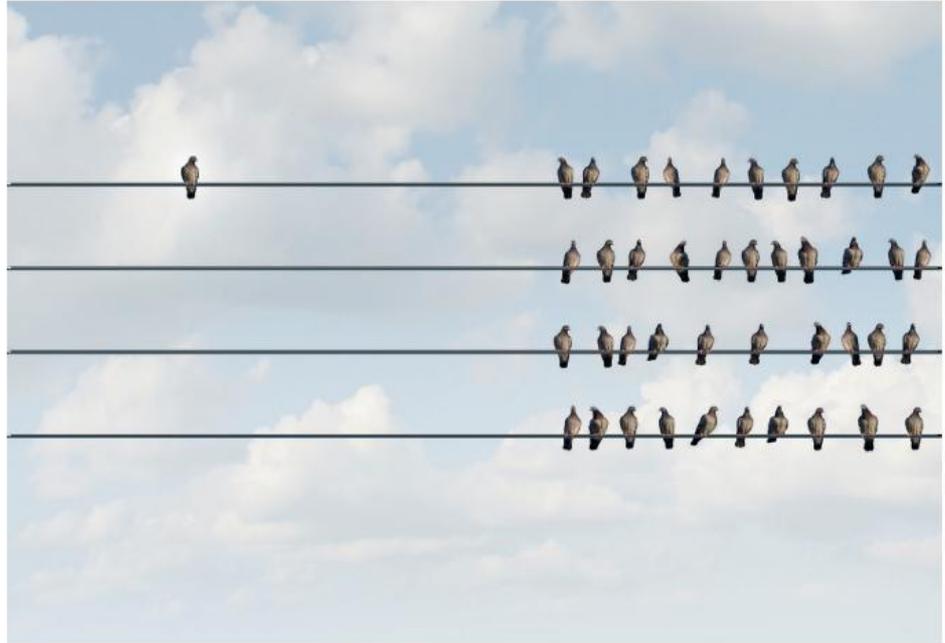
- the personal is emphasized more than the social
- individual autonomy and self-expression are encouraged, and people are viewed as unique
- there is more of an emphasis on individual achievement than achieving group harmony
- competitiveness and self-sufficiency are highly regarded
- priority is placed on the goals of the individual
- conformity to group norms is low.

In collectivist cultures:

- the social is emphasized more than the personal
- individual autonomy and self-expression are not encouraged
- there is more of an emphasis on achieving group harmony than on individual achievement
- a person’s identity is largely based on membership of the group (Figure 3.31)
- priority is placed on the goals of important groups (extended families, work groups, etc.)
- conformity to group norms is high.



Markus and Kitayama (1991) investigated how self-construals differ between individualistic and collectivistic cultures. For more on individualistic and collectivist cultures, see pages 71–72.

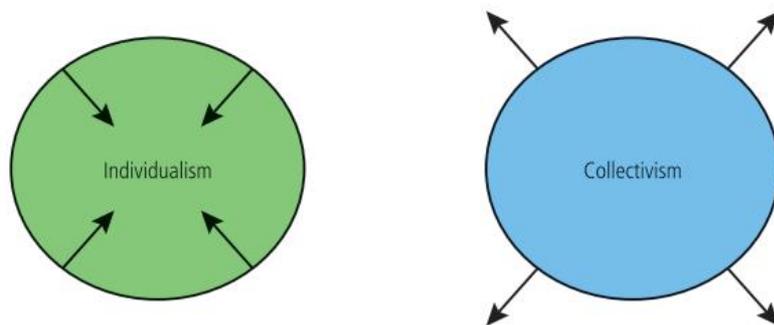


▲ **Figure 3.32** How do you see being apart from the group? Is it a sign of leadership or exclusion?

To what extent is the IB Learner Profile a set of cultural dimensions?

TOK

These differences in self-construal influence various aspects of behavior, such as communication styles, conflict resolution and decision-making. For instance, in individualistic cultures, direct communication and asserting one's opinion are valued, whereas in collectivistic cultures, indirect communication and maintaining social harmony are prioritized (Figure 3.33).



▲ **Figure 3.33** Is your outlook more focused inwards on you as an individual, or outwards toward your role in a community or group?

TOK

Is it possible to discover laws of human behavior in the same way that the natural sciences discover laws of nature?

Critical thinking

While Markus and Kitayama (1991) highlight cultural differences, they also implicitly suggest underlying human universals that transcend cultural boundaries. For instance, regardless of cultural background, all individuals navigate a complex interplay between the need for autonomy (associated more with individualism) and the need for connectedness (associated more with collectivism). Every culture has mechanisms for addressing these fundamental aspects of human experience, albeit in different ways. Thus, the similarity lies in the universal human challenge of balancing self-interest with the interests of the group, which all societies must manage. Therefore, the study illustrates that, despite cultural differences in how self-concept is constructed and expressed, the underlying human needs driving these constructions, such as belonging, esteem and understanding, remain consistent across cultures.

The relationship between cultural dimensions and behavior also raises issues of *causality* and bidirectional ambiguity. Researchers cannot be sure if it is the culture's position on the individualism/collectivism continuum that is driving the difference in behavior, or if these differences in behaviors between cultures is what positions cultures on different points on the continuum. The reality is that it is likely to be a combination of both of these forces.



Conceptual question

Cultures are dynamic systems that are constantly *changing*. Consider the culture you feel most connected to. How has it changed over the past two years? 10 years? 100 years? How might it be different a decade from now?

Social identity theory

Social identity theory (SIT) proposed by Tajfel and Turner (1979) assumes that people define themselves in relation to social groups. Therefore, a person's sense of who they are is based on their membership of social groups.

In SIT, a person does not have just one “personal self”, but rather several social selves that correspond to widening circles of group membership. For example, you might have multiple identities as a student at your school, as part of a sports team, as a member of your family and as a citizen of your country. Sometimes one of your “social selves” can become more salient – that is, you become more aware of that facet of your identity. If you are a French national living in Singapore, for example, you may find that you take seemingly contradictory positions depending on the situation you find yourself in. When French people or media criticize Singapore, you may find yourself defending Singapore, and when Singaporeans are critical of France, you may find yourself defending France. In other words, your relationship to each country becomes more salient to you in different situations, and this part of your identity becomes sensitive to specific criticism.

Everything that your individual self can do, your social selves can do. You can feel depressed or ecstatic just because you are a member of a group (think about the last time your sports team won/lost a big match), and you can feel a sense of pride because



For more on SIT, see pages 77–79.

you are affiliated with a group (pep rallies at schools aim to foster this sense of group pride in school identity). People belong to many groups and derive much of their identity from the behavior of other people within these groups.

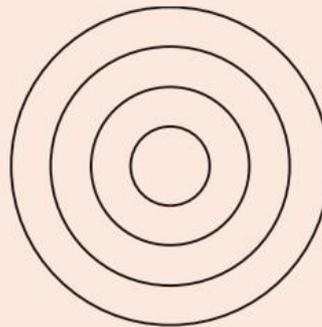
Activity 104

Interview three people from your class by just asking them who they are. To what extent do they define themselves by identifying groups they belong to? Did they provide an alternative perspective on their identity that SIT did not capture?

Conversely, people tend to perceive people in other groups (outgroups) negatively. This process can lead to the outgroup homogeneity effect whereby members of ingroups will perceive members of their own group as being more diverse than an outgroup and perceive members of an outgroup as being more similar to one another.

Activity 105

How do you define your own identity? Using a series of concentric circles, group words that define who you are and reflect important parts of your identity. Place the words that are more central to your identity closer to the center, and those words that are less central to your identity further from the center.



What did you notice? How many words did you use that represent a relationship to a group (for example, your role in your family, your nationality, your favorite sports team, your school membership or your role as a student)? In what ways do these groups shape your behavior?

More detail on this study can be found on pages 77–79.



Park and Rothbart (1982) noticed how sorority members found more individual differences (particularly positive characteristics) amongst members of their own sorority compared to members of other sororities.

Therefore, SIT can be used to explain behavior because it shows the process of ingroup favoritism and outgroup stereotyping via outgroup homogeneity on the women's attitudes towards their own and other sororities.

Critical thinking

There are issues relating to *measurement* when considering the Park and Rothbart (1982) study, in that the results may not be generalizable beyond the sorority system. The study is ethnocentric and gynocentric in that it studies a very small subculture of only women with a YAVIS *bias* (university students are often referred to as younger, more attractive, more verbal, more intelligent and more social than the general population). However, the study does demonstrate SIT in action in that it demonstrates ingroup favoritism and how participants denigrate outgroups.

SIT was largely developed within Western contexts and offers a Western *perspective*. Yuki (2003) suggests SIT is less reliable in explaining behavior in non-Western communities. Yuki investigated the extent to which SIT is applicable within US and Japanese contexts and found:

- loyalty to and identification with their ingroup was greater with American participants than with Japanese participants
- evidence suggests that discrimination against outgroups is more pronounced in individualistic cultures
- there is no evidence to support the theory that there is ingroup favoritism.

Yuki (2003) concluded that SIT “may not accurately represent group behaviors among East Asians”.

TOK Using the research by Yuki (2003) and your understanding of the key concept of *bias*, what forms of protection against research error and bias are available to human scientists?

SIT can also be harnessed as a vehicle of social protest and *change*. SIT has shown how collective protest can sometimes be predicted by people’s level of identification with their ingroups (Figure 3.34).

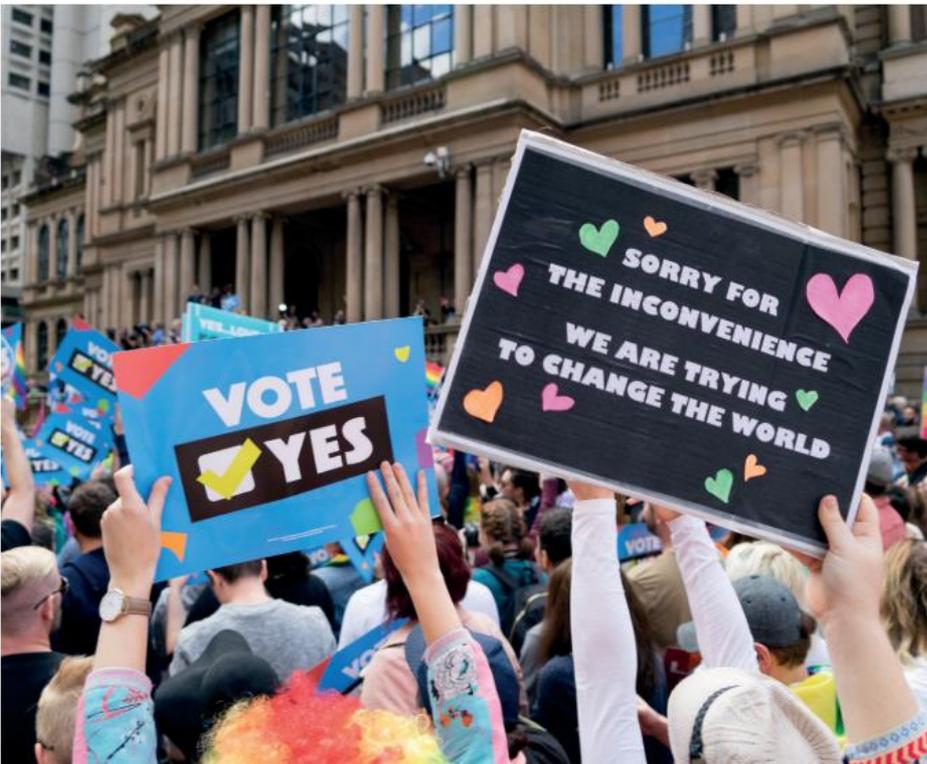


Figure 3.34 Identification with ingroups can be harnessed to create meaningful change.

Participation in trades union, LGBTQI+ and elderly people's protests was generally predicted by the strength of people's identification with their ingroups (Kelly and Breinlinger, 1995). Wright and Taylor (1990) unjustly deprived a group of people and then offered individuals the possibility of leaving the group. The study found that collective protest only occurred when people felt they could not leave their group and concluded that even when just a few members of the deprived group could join a more privileged group, collective protest was unlikely to occur.

SIT assumes that ingroup bias is driven by the desire to perceive one's ingroup, and oneself, positively. There should, therefore, be a *causal* relationship between intergroup differentiation and self-esteem; that is, positive intergroup differentiation should cause people to feel better about themselves when they judge or treat their ingroup better than their outgroup. Research such as Yuki (2003) has not supported this claim.

Social learning

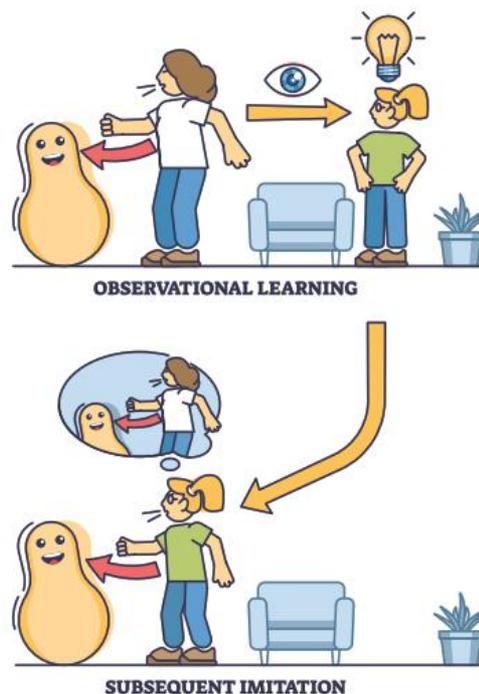
Social learning theory (SLT) (Bandura, 1977) proposes that behavior is modeled by other members of a social group and acquired through observation or imitation based on consequences of a behavior.

Activity 106

Can you identify five things you do that you have learned by observing others, perhaps family members or school friends? It may be a way of thinking, talking or walking. It may be the way you tie your shoelaces or eat your breakfast.

Bandura et al. (1961) aimed to find out when and why children display aggressive behaviors. They conducted a study where adults demonstrated verbal and physical aggression toward an inflatable doll (called a Bobo doll) in the presence of preschool-aged children, many of whom subsequently reproduced the aggressive behavior (Figure 3.35).

Figure 3.35 The Bobo doll experiment.



For a more detailed discussion of SLT, see pages 79–81.



Key study

Bandura et al. (1961)

Aim To find out why and when children display aggressive behaviors.

Method An experiment was conducted with 72 children (36 boys and 36 girls) aged 3–6, all of whom were enrolled in Stanford University’s day-care program. While the participants played with books and stickers, an aggressive adult model (sometimes a male model, sometimes a female model) played briefly but shortly afterwards spent the rest of the time behaving aggressively (both physically and verbally) toward the Bobo doll, in a standardized way that would be used with each of the children. At the same time, another (adult) model played in a subdued, non-aggressive way. The children were then taken to another room where they played with some toys for about two minutes. A researcher then took these toys away, but the children were left with other toys they could play with. The children were then taken (individually) into another room that contained toys that were considered aggressive or non-aggressive. The aggressive toys were a Bobo doll, a mallet and dart-guns. The non-aggressive toys were a tea set, cars and dolls. Several researchers observed the children and recorded details of their behavior.

Results Of the children who were exposed to the aggressive adult model, the boys showed an average of 38.2 physically aggressive acts and the girls showed 12.7 physically aggressive acts. Boys and girls imitated the male models more than the female models with respect to physical aggression but imitated the model of their gender more with respect to verbal aggression.

Conclusion The study concluded that children can learn behavior by observing an adult’s behavior. It also concluded that boys are more likely to mimic the behavior of men, and girls are more likely to mimic the behavior of women, and that females tend to be less aggressive than males.

If SLT can be used to explain how we learn aggressive behavior, it follows that it can be used for humans to learn constructive behaviors too. By exposing children to role models who demonstrate empathy, communication skills and constructive conflict-resolution skills, we can influence the behaviors children learn and are more likely to demonstrate themselves.

Critical thinking

An extension of SLT is Social cognitive theory (SCT). SCT includes the effects of cognitive processes, such as judgment, conceptions and motivation, and has been used by governments to *change* social behavior. For example, in 1975 a soap opera, *Ven Conmigo (Come with Me)*, was created in Mexico to entertain, but primarily to promote, adult literacy. The soap opera centered on the lives of adults in a literacy class and captured large viewing audiences. The program generated a 900 percent increase in enrollments in adult literacy classes compared to the previous year. After an episode that mentioned how to access free literacy booklets, 25,000 people approached the organization to get copies of the same booklet.



See page 81 for examples of initiatives designed to use the principles of SLT.



Bandura et al.’s study has raised issues of *responsibility*. Think about the ethical considerations that are relevant in this research. To what extent are the methods used in the human sciences limited by the ethical considerations involved in studying human beings?

Theories and models are simplified explanations of human behavior. These theories are often adapted over time as research attempts more detailed explanations. Being simplifications, they come with limitations as well as strengths. Always offer balanced discussions of theories and models.



SCT is derived from studies that have been replicated. While the original studies (such as Bandura's Bobo doll) lacked ecological validity and were conducted with a group of participants who limited the study's ability to be generalized, SCT has been studied with broader ranges of participants and the conclusions support SCT's basic hypothesis that people learn some behaviors by observing others' behaviors.

SCT is a broad and ill-defined theory of learning- or behavior-acquisition that is still evolving. It neglects the role of emotions and cognitive learning in explaining behavior, and it does not explain why some people replicate or mimic behavior that has been modeled and some do not.



Conceptual question

Bandura et al.'s (1961) study is often used to justify the *responsibility* of censoring of information and content for young children so that they do not learn anti-social behaviors. Think of age restrictions on violent video games. But is it really fair to claim that observing violence causes people to be violent? What about all the people who see violence but do not become violent in turn?

Interpersonal relationships

Area of study	Learning objectives
Chemical messengers	The role of one or more chemical messengers in interpersonal relationships.
Cognitive explanations	One or more cognitive explanations for interpersonal relationships.
Communication/language	The role of communication in interpersonal relationships.
Strategies for improving relationships	One or more strategies for improving interpersonal relationships.



Table 3.20 Interpersonal relationships learning objectives from Subject Guide, page 31.

In this section, personal relationships will be discussed in the context of romantic love and romantic relationships. Lindholm (2006) has defined romantic love as an intense attraction that involves the idealization of the other.

The study of interpersonal relationships is complicated by *measurement* issues of construct validity: we cannot all agree on what we mean by romantic "love", and it can look very different in different cultures. To tackle this issue, some researchers try to divide love into different sub-categories. Hatfield and Rapson (1993) divide love into compassionate and passionate love, where compassionate love is the appreciation and respect for a long-term life partner who has shared many of the same impactful life events and experiences. This type of love requires trust and affection and develops over time. In contrast, passionate love is associated with the desire and infatuation that occurs when thinking of the object of our affections.



You should have an understanding of one or more of the following: social relationships or interpersonal conflict/aggression.

Activity 107

Hatfield and Sprecher's (1986) Passionate Love Scale instrument aims to give users an idea of how in love they are.

Adapted from Hatfield and Sprecher (1986) Passionate Love Scale

Some common terms for passionate love are romantic love, infatuation, love sickness, or obsessive love.

If you have never been in love, think of the person you came closest to caring for in that way.

**Try to describe the way you felt when your feelings were most intense.
Answers range from (1) Not at all true to (9) Definitely true.**

Whom are you thinking of?

_____ Someone I *love right now*.

_____ Someone I *once* loved.

_____ I have never been in love.

	Not at all true								Definitely true
	1	2	3	4	5	6	7	8	9
I would feel deep despair if _____ left me.									
I feel happy when I am doing something to make _____ happy.									
I would rather be with _____ than anyone else.									
I'd get jealous if I thought _____ was falling in love with someone else.									
I want to know all about _____.									
For me, _____ is the perfect romantic partner.									
_____ always seems to be on my mind.									
I want _____ to know me – my thoughts, my fears, and my hopes.									
I get extremely depressed when things don't go right in my relationship with _____.									
Total _____									



Figure 3.36 Passionate Love Scale instrument (Adapted version).

Chemical messengers

There are a range of chemical messengers that play a role in interpersonal relationships; these include neurotransmitters and hormones. Hormones are chemical messengers that are produced in glands and are secreted into the bloodstream where they can

bind with receptors and affect our behavior. This process is called the endocrine system. As hormones operate in the bloodstream, they take longer to affect behavior than neurotransmitters (minutes, hours or days as opposed to seconds for neurotransmitters). However, as they linger in the bloodstream for longer than an action potential is active for, their effects are longer lasting.

Hormones flowing through the bloodstream bind with target cells (which have receptor sites, much like lock and key theory explains in neurotransmission (Figure 3.37)). They have no effect when they come into contact with other cells that are not target cells. When they do bind to target cells, they produce a reaction that either increases or decreases the target cell's function. There are more than fifty types of hormones, and they are involved in a wide range of behaviors. This section will explore the role of oxytocin in interpersonal relationships, specifically in relation to love and attraction. However, other hormones such as vasopressin and adrenaline are also involved.

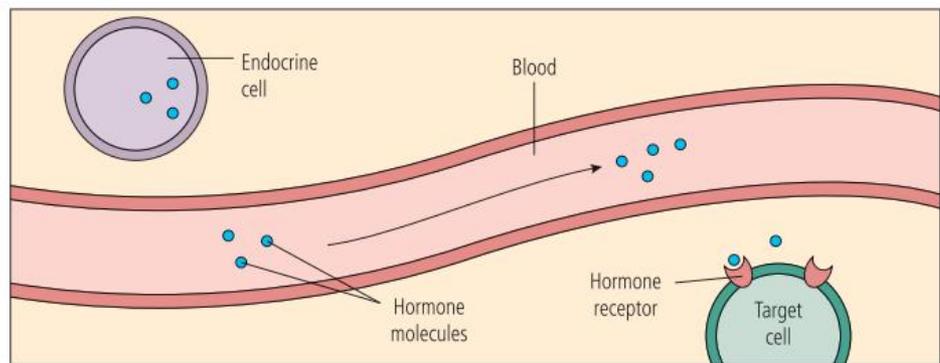


Figure 3.37 Endocrine glands create hormone molecules that get released into the blood stream and then bind with target cells that have “matching” receptors.

Oxytocin is a hormone produced in the hypothalamus and then secreted by the pituitary gland. It is involved in many behaviors involved in interpersonal relationships such as pair bonding, feelings of love, mother–child attachment and social trust.

Adrenalin is a stress hormone produced and secreted by the adrenal glands that sit above the kidneys and plays a role in the fight or flight response.

Vasopressin is produced in the hypothalamus and plays a similar role as oxytocin in pair bonding and attachment but is in relatively much higher concentrations in males when compared to oxytocin.

Psychologists investigating the role of chemical messengers in love and attraction would argue that deep infatuation and an all-consuming sense of love (and lust) is the result of a mix of chemical messengers swirling around our systems. These chemical messengers affect us physically (giving us a nervous feeling in our stomach, pumping blood to other organs, etc.) as well as mentally, by clouding our judgment or giving us a sense of elation.

Researcher Helen Fisher (2004) has famously called this a “love cocktail”. Through her work focusing on dopamine, adrenaline and serotonin, she suggests that seeking this feeling of being in love is hardwired into the reward systems in our brains and motivates us to seek love in others. She goes further, suggesting that this is based on the evolutionary principle of wanting to pass on our genes, and that this “love

Hormones can also be studied in Biology and Chemistry. How do we decide whether a particular discipline should be regarded as a human science? Do the boundaries between different disciplines and different areas of knowledge help or limit understanding?

TOK

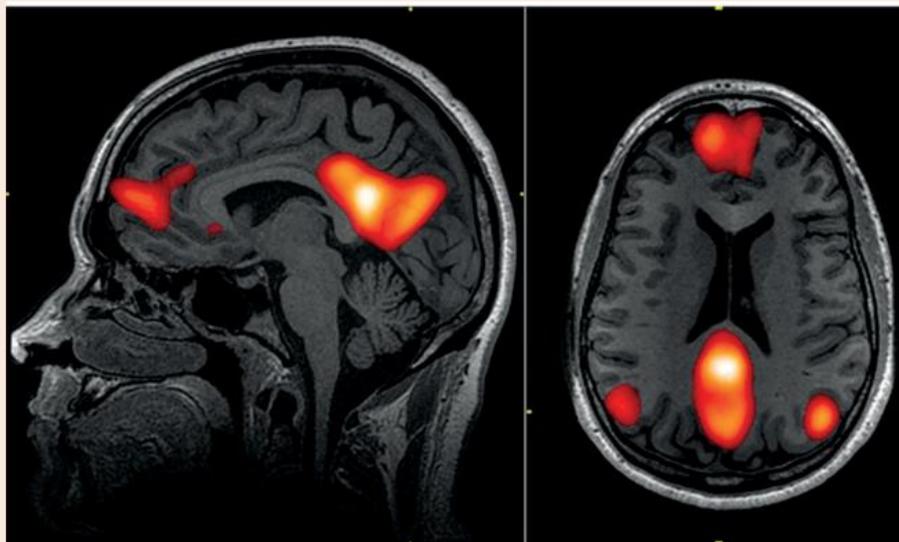
cocktail” makes it rewarding to mate with those we are in love with. She speaks of adrenaline’s role in the stress response: decreasing the need to eat and sleep and increasing the ability to focus on a target, in this case a potential mate. Serotonin is also a neurotransmitter involved in attention and the “feel good” emotions associated with being in love. Dopamine appears in high concentrations in the rewards pathway of the brain and is highly activated when people are experiencing interpersonal love. While we do not know the exact role of these (and many other chemical messengers in the “love cocktail”), we do know they are involved.

Key study

Fisher, Aron and Brown (2005)

One set of studies which does shed light on the role these chemical messengers play was conducted by Fisher, Aron and Brown (2005), who conducted fMRI scans (Figure 3.38) on the brains of over 50 people in love (both men and women). While participants were in the fMRI machine, the researchers asked them to look at photos of their partners (treatment condition) or photos of acquaintances (control condition). As you would expect, participants’ reward pathways were more active, as were concentrations of dopamine, adrenaline and serotonin, when participants were looking at photos of their partners when compared to photographs of acquaintances. The right caudate nucleus was particularly active in this study when participants were viewing partners with whom they were in love. This section of the brain is associated with noticing and the expectation of rewards. Another brain area, the right ventral tegmental area, which is at the heart of the brain’s “reward system” and is associated with pleasure and motivation, was particularly active.

What was even more interesting was that before the fMRIs, participants were asked to self-report on a questionnaire how in love with their partners they were, and she found a correlation between brain activity in the reward pathways and self-rated “love” scores on her pre-fMRI measures.



▲ **Figure 3.38** fMRIs show activity patterns in parts of the brain.

Critical thinking

There are issues of *causality* associated with Fisher, Aron and Brown's studies. The issue of bidirectional ambiguity between the role of chemical messengers and romantic love is still present. We cannot be sure if these chemical messengers make us feel love or if feeling love boosts the activity of these chemical messengers. Similarly, the use of fMRIs has a range of limitations as a data collection tool. They collect data in a very unnatural environment (while lying flat in a loud, donut-shaped machine). fMRIs measure blood flow (they are only an indirect measure of brain activity) and the colors associated with fMRIs amplify "noise" and may represent more activity than is present.

Similarly, Fisher's *responsibility* as a researcher and to the field of psychology could be called into question as she was employed by match.com, a large internet dating company, at the time of the research. It might be argued that her employment compromised her study, which produced positive results. This does not negate the validity of the research, and she is honest about her funding, but it should be considered when interrogating the findings of the study.

You can read more about brain imaging techniques on pages 39–40.



Structural imaging like MRIs focus on what parts of the brain look like in relation to each other, whereas functional imaging like fMRIs focus on the activity within the brain.

Cognitive explanations

A cognitive explanation for interpersonal relationships assumes that cognitive processes influence who people form relationships with. One cognitive factor involved in attraction and intimate relationships is self-esteem. Self-esteem is your overall opinion of yourself and your view of your self-worth.

Kiesler and Baral (1970) aimed to test whether boosting the feelings of self-esteem in male participants would increase their chances of talking to an attractive woman. They issued a fake IQ to male participants. The participants were then given fake scores that were either high or low. The men were asked to wait in a room and an "attractive" female entered. They found that the men who had been given high IQ scores were quicker to talk to the woman. Kiesler and Baral (1970) concluded that self-esteem influences the chances of individuals interacting.

The stereotype that "opposites attract" is common in movies and popular culture. However, psychological research tends to support the opposite theory, that we are actually attracted to those who are similar to us (Figure 3.39). This is called the attraction–similarity model (Morry, 2007). This supports Kiesler and Baral's (1970) work as it proposes that when we surround ourselves with people who are similar to us – people who reinforce our own viewpoints and beliefs – our self-esteem rises, making us feel more attractive ourselves. Byrne et al. (1971) suggest not only that being around those who agree with us boosts our self-esteem, but that having one's own ideas and beliefs constantly validated is rewarding in itself.

Across a range of variables such as personality, cultural background, IQ, physical attractiveness, religion, socioeconomic status, education levels and age, people tend



Figure 3.39 Cognitive explanations of human relationships often draw on the notion of similarity, the idea that we gravitate to those like ourselves.

to be more attracted to, and to form interpersonal relationships with, people who are similar. Even in the era of globalization, people tend to live in communities with people who share many of the same characteristics. Additionally, people often seek out those with similar hobbies and interests, increasing the time they spend around similar people. A large-scale questionnaire study by Markey and Markey (2007) supports the attraction–similarity model.

Key study

Markey and Markey (2007)

Aim To investigate the extent to which perceived similarity is a factor in the way people choose partners.

Method Markey and Markey recruited 103 single female and 66 single male undergraduate students through advertisements. The participants first completed a questionnaire in which they rated their own personality in terms of values and attitudes, and then described the personality of their romantic ideal, also in terms of values and attitudes. They also completed filler questionnaires that disguised the true purpose of this study.

Results Participants' perception of their own values was similar to their perception of their ideal partner's values and attitudes.

Conclusion The study provides empirical support for the notion that people are attracted to partners they perceive to be similar to themselves.

Critical thinking

The methodology of this study raises issues of *measurement* as it measures perceptions of an ideal partner, rather than the behavior of actively seeking to select a mate with similar attitudes and beliefs. As we know, in the heat of the moment, emotions – especially those associated with passionate love – often overrule logic, reason and what we may perceive as our ideal partner. The other issue with this study is its use of questionnaires, a form of self-report data that often lacks validity and reliability, even when completed confidentially. The sample was also very ethnocentric and subject to the YAVIS *bias*, as only young Americans were involved in the study. There is also the question of *causality* as there is bidirectional ambiguity, with the phenomena of “attitude alignment” occurring when people form a romantic relationship. Davis and Rusbult (2001) have found that when people form a romantic partnership and are attracted to each other, their attitudes become in-sync and they become more similar to each other, so while similarity might breed attraction, attraction might also increase similarity.

Activity 108

Think of some celebrity couples you know from the media. Do these relationships fit the requirements of the attraction–similarity model? Is there another *perspective* you could bring to analyzing celebrity couples? What might an alternative explanation for these matches be? Discuss in a group.



TOK

Is human behavior too unpredictable to study scientifically?

Communication/language

Interpersonal communication refers to the exchange of information between two or more people using direct or indirect methods. The focus of the study of interpersonal communication is not only the message itself but also whether the receiver understands the message.

Communication plays a large role in the formation and maintenance of romantic interpersonal relationships. However, the type of role can vary depending on the type of romantic relationship. Fitzpatrick and Ritchie (1994) argued that people have internalized ideologies that act as marital schema. These are internal cognitive models that then frame their actions and perceptions regarding communication. For example, participants who saw themselves as “traditional couples” viewed themselves as more dependent on each other, which led them to have high levels of assurance but low levels of openness; that is, they were very assured in their relationship but did not necessarily share every thought with their partners. “Independent couples” communicated more in highly expressive styles, with unconventional values and moderate levels of interdependence. It could be argued that “traditional” couples wanted to avoid conflict and so were less open, whereas “independent” couples wanted to solve problems rather than avoid them. Therefore, communication plays different roles in different relationships.

When used to affirm and in a positive light, communication can be extremely beneficial and support a romantic relationship. However, when communication breaks down or destructive communication styles and patterns are used, communication can lead to relationship degradation and breakdown.

Key study

Driver, Gottman et al. (2003)

Aim To investigate communication styles amongst people in committed relationships.

Method Driver, Gottman et al. (2003) studied 156 married couples in a “love lab” (their words), where they were video recorded having a conversation about three topics after not speaking for 8 hours. Physiological measurements such as galvanic skin response (GSR) and heart rate were recorded during the conversations. The couples discussed what events had happened that day and agreed on one pleasant topic and another topic that they knew they would disagree about. The discussions were video recorded, and different emotions were observed.

Results Driver, Gottman et al. found that the older couples, with longer marriages, communicated more affection to their partner during the discussions, but middle-aged married couples displayed more negative emotion. Couples in unhappy marriages also expressed more negative emotions. Couples in happy marriages were better able to manage their emotional displays, showing more positive emotions while withholding negative emotions. Therefore, in successful relationships, people communicate with their partner in a way that avoids negative results.

Conclusion Driver, Gottman et al. argue there are four major emotional reactions that come through in communication patterns that are destructive within relationships and can be used to predict divorce: criticism, defensiveness, stonewalling and contempt. Driver, Gottman et al. have labeled these negative emotional reactions the “four horsemen of the apocalypse” in terms of relationships (Table 3.21 and Figure 3.40). Of these four, Driver, Gottman et al. consider contempt to be the most potent.

Couples who avoid these emotions in their relationships will have more successful couplings, but it should be noted that the presence of negative emotions does not mean that there is a problem in the relationship.

TOK

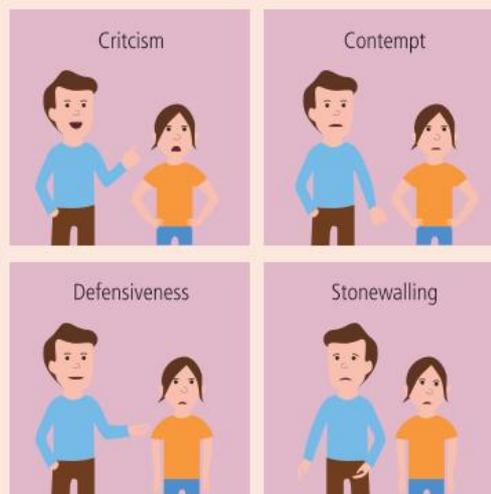
How can complex and deeply personal phenomena such as communication be *measured* in the human sciences? Researchers may focus on elements they can quantify to allow for statistical analysis to take place and to allow their research to be replicated by others.

According to Driver, Gottman et al., anger does not necessarily have a negative impact on relationships. Happy couples can be as frequently angry as unhappy couples, and if anger is communicated appropriately, it can actually help maintain relationships. Furthermore, living with an unresolved conflict can be a normal and healthy part of relationship maintenance.

Driver, Gottman et al. (2003) found that 69 percent of happy couples still have the very same unresolved conflicts after ten years yet remain happy because they do not get stuck in the conflict and manage to work around it.

	Definition	Example
Criticism	Always seeing yourself as right and attacking your partner's perspective or actions	"You always . . .", "You never change", "Why can't you ever . . ."
Contempt	Coming from a place of superiority and believing your partner is inferior	Name calling, gaslighting, eye-rolling, mocking, making the partner the butt of a joke. Calling them "dumb, worthless, unmotivated, ugly, overweight", etc.
Defensiveness	Making yourself the victim and turning what your partner has to say around on them	"I don't say that; you say that", "I'm not the one that started doing that", "It's not my fault that you can't . . ."
Stonewalling	Disengaging and waiting for the conversation to finish. Either leaving the room or switching off from listening	Avoiding conflict, internally stewing, trying to change the subject, not engaging in discussion about conflict

▲ **Table 3.21** Driver, Gottman et al.'s "Four horsemen of the communications apocalypse".



▲ **Figure 3.40** Driver, Gottman et al. argue that there are four major emotional reactions that are destructive within relationships and can be used to predict divorce: criticism, defensiveness, stonewalling and contempt.



Conceptual question

Studying personal relationships is a sensitive topic. What *responsibilities* do researchers working in this space have to their participants, to the profession of psychology and to society as a whole?

Key study

Saunia and Reid (2008)

Aim To investigate whether couples who believe in traditional roles in a marriage have less satisfaction.

Method Saunia and Reid asked 114 married people of South Asian descent living in Canada to complete a questionnaire. Only one partner completed the questionnaire, and the researchers used a snowball method to contact participants: the first participants were given copies of the questionnaire to give to friends and family. The questionnaire contained questions about their attitudes toward marriage, their communication style in the marriage and their marital satisfaction

Results The study found that traditional role beliefs did not result in lower marital satisfaction. However, there was a connection between satisfaction and the listening style in the relationship. Those who had traditional beliefs and did not listen to understand their partner were less likely to be satisfied. What is insightful about this particular study is the use of the arranged marriage sample. Despite having less choice in their partner, listening played a key role in producing satisfaction in the relationship. Therefore, arranged marriages with traditional role beliefs can be satisfying, but it is necessary for the partners to practice listening to understand how their partner feels. This is important because it suggests that communication may have a stronger role in maintaining happy relationships than the cultural factors that cause people to marry.

Conclusion Saunia and Reid argue that it is necessary for people to practice listening to understand how their partner feels and to respond in a way that shows they have actually understood what has been communicated.

Critical thinking

While Saunia and Reid (2008) did show that the role of communication perhaps outweighed the role of the type of marriage, it is important to consider issues of *perspective* and *bias* when considering research on communication in romantic relationships. The majority of research on romantic relationships comes from the *perspective* of Western researchers. This raises issues of generalizability to those in other cultures.

These issues of generalizability are even greater when we consider that sampling *bias* is often present in psychological research, in which the majority of samples are made up of university students (and mostly university students in the USA). University is a time in which people are often exploring their identity, so to base theories of romantic relationships on university students' experiences might be misleading. Research such as Driver, Gottman et al.'s, which investigates the role of communication in relationship breakdown, also comes from a perspective of privilege; the couples studied could dissolve their relationships if they wanted to.



You can read more about the snowballing sampling method on pages 126–27.

To what extent are the methods used to gain knowledge in the human sciences “scientific”?

TOK

People in relationships in other cultures do not always have that luxury where societal (and sometimes legal) pressures make divorce or separation near impossible. This also suggests that research on the role of communication in interpersonal relationships will be inherently *biased*, as only participants in places where relationship dissolution is an option will take part.

Issues of *measurement* are also a factor as some of this research lacks temporal validity – in many parts of the world, what people expect from romantic relationships has changed in the last 50 years, yet theories from the 1970s or earlier are still relied upon in psychology. Researchers of romantic relationships also have a great *responsibility* to maintain ethical standards. It would be unethical to conduct experimental research on many of these topics, which means correlational methods are highly relied upon by researchers in this field.

Strategies for improving relationships

One perspective that can be applied to romantic relationships is to view them through the economic lens of giving and receiving, or of costs and benefits. This theory is called social exchange theory (SET) (Thibaut and Kelley, 1959). SET proposes that relationships are maintained through a constant cost–benefit analysis and that costs must not outweigh the benefits for a long period of time; the more one invests in a relationship, the more one expects in return. A further assumption of SET is balance. It argues that balance must be maintained over the long term with regards to partners’ investment and returns.



Key study

Carlson et al. (2014)

Aim To investigate the relationship between housework and sex.

Method Carlson et al. (2014) analyzed data on housework and sex from the 2006 Marital and Relationship Survey of a representative sample of 600 married and cohabiting low- to moderate-income couples with children.

Results They found that couples who shared the routine housework equally had the most intercourse (7.74 times a month). They reported the highest level of satisfaction with that frequency compared to the other couples, and also the highest quality of the sexual relationship.

Conclusion When men are expected to take part in the housework and share in the upbringing of children and perceive this as fair within a cost–benefit analysis, it can lead to increased intimacy in Western societies.

SET assumes that relationships are maintained through a constant cost–benefit analysis and the costs must not outweigh the benefits (Thibaut and Kelley, 1959).

However, cost–benefit analysis is dependent on perception and expectation. If a marriage is built on traditional expectations, then the perception of costs and rewards will be different to one built on non-traditional expectations. “Traditional marriage” refers to a model where the man (the “breadwinner”) focuses on providing economically for the family and the woman focuses on taking care of the home and being the main care provider for the children.

Despite Norway having high levels of gender equality, divorce rates for the couples who did equal housework is approximately 50 percent higher than that of more traditional couples, where the woman does it all (Hansen and Slagsvold, 2012). This could be interpreted as traditional roles providing clear rules for each person, where costs and benefits are also clear, and suggests relationships are more likely to be maintained when agreed roles match each partner’s expectations and each partner feels that they are being fairly treated within a cost–benefit paradigm.

Within this social exchange theory, there are lots of ways to invest in the relationship as a strategy to improve the relationship (Figure 3.41).

- Financially: Earning more or getting a higher paid or second job.
- Domestically: Doing more housework or child care.
- Physically: Improving one’s appearance (new clothes, plastic surgery, weight/muscle loss/gain, etc.).
- Social status: Gaining fame, popularity or a higher socioeconomic status.
- Education: Receiving a higher level of educational attainment.
- Offspring: Producing more children, if that is desired by a partner.
- Activities: Engaging in hobbies that a partner enjoys.
- Communication: Adopting more positive and affirming communication styles.
- Sexually: Greater levels of intimacy.



Figure 3.41 Investments in a relationship.

Activity 109

What would you add to the list on the previous page? What would you be willing to invest in a relationship, and what would you wish your potential partner to invest in the relationship?

Critical thinking

Social exchange theories are criticized as being highly reductionist for trying to minimize one of the most joyful parts of being human, experiencing love and affection, and reducing it to an economic equation. These issues of *measurement* are compounded by the fact that it is not “actual investment” in relationships that people consider; it is their perception of these investments. It is more accurate to talk of perception of imbalances and inequality because each is dependent on an individual’s perspective. In addition, the theory cannot be tested rigorously because it is difficult to quantify costs and benefits in a relationship, particularly when they are so open to individual differences and perceptions.

Trying to study and understand *change* in relationships, such as steps that can be taken to improve relationships, has also been criticized as an ethnocentric *perspective*. In many cultures, there are barriers that inhibit the possibility of change within a relationship or the option of leaving it entirely. For example, divorce is largely illegal in several countries. In others, the divorcing party might have to convince a court of the following, which can be challenging in many cases:

- physical abuse
- infidelity
- sexual abuse
- criminal activity
- sexually transmitted diseases
- drug addiction
- failure to provide basic material obligations
- abandonment
- alcoholism.

Is the role of the human scientist only to describe what the case is or also to make judgments about what should be the case?

TOK



Conceptual question

Social exchange theories come from a Western *perspective*, where individual agency is assumed to be high, and there are low societal barriers to change. For example, in many Western cultures it is considered very normal for an individual adult to consider changing where they live, their job, religion, hobbies or lifestyle for their spouse or for a relationship. However this is not universal. How might other perspectives interpret social exchange theories?

Research method: Questionnaire

Questionnaires are often used as a research method to investigate human relationships. A questionnaire (also known as a survey) is a research tool or instrument consisting of a set of questions asked of a participant. A questionnaire is written (or typed online) as opposed to an interview, which is done verbally. However, to make some questionnaires more accessible to those who cannot access written text, they can also be read aloud by a researcher.

Because they can be mass distributed (either by mail-out or an email to a group), questionnaires are particularly useful in studying large populations. They are also useful for studying a wide range of subjects, such as participants' opinions, preferences, behaviors, attitudes, thoughts and feelings. They often use both open-ended questions (in which participants can respond freely and at length) and closed questions (such as multiple choice or yes/no responses). Open-ended questions are useful for generating rich, deep qualitative data, which may take longer to analyze but will lead to detailed depictions of the topic. Closed questions are useful for generating quantitative data, which does not take much time or effort to analyze but may only provide surface-level insights.

Benefits of questionnaires	Weaknesses of questionnaires
Cheap, quick and easy to administer	Self-reporting: participants may lie
Can gather large amounts of data from a large sample	Potentially low response rate, survey fatigue
Can gather both qualitative and/or quantitative data	No flexibility or opportunity to follow up
Potentially high levels of anonymity and confidentiality, so useful for sensitive issues	

Class practical

Designing your questionnaire

Questionnaires are often used in the study of human relationships. Examples of questionnaires you may wish to make use of in your class practical are Buss' (1989) Cross-cultural Differences in Attraction or Hatfield's (2013) Passionate Love Scale. You may, however, wish to design your own. If you are going to design your own questionnaire to investigate an aspect of human relationships, consider the following guidance on survey construction.

Considerations when designing a questionnaire

- Ensure you have well thought out research questions. This treats participants with respect and does not waste their time with irrelevant questions or poor survey design.
- When writing questions, ensure only one phenomenon is being addressed per question. This avoids double-barreled questions – a hallmark of poorly designed questionnaires.
- Consider the length of the questionnaire. It should be as short as possible to get the highest completion rate possible.

- Conduct a pilot study: give the questionnaire to some friends or family members so that they can give you some feedback and help troubleshoot any issues in your design.
- Consider the question order: questionnaires are used to investigate many sensitive issues in human relationships, and when they do, questions should begin with the least sensitive and progress to the most sensitive.
- If a questionnaire is long, it will likely be subjected to the order effect. This is where an answer to one question biases a participant to respond in a certain way to a subsequent question. To avoid this, consider adjusting the order of questions when giving the questionnaire to different participants.
- Ensure that questions are written in plain language and avoid any technical, “jargonistic” or slang terms.
- Ensure your survey looks professional and displays the endorsement of whoever is issuing it (your school logo, your signature or your teacher’s name, for instance).
- Consider how the questions will determine the data you will collect. Are you trying to make statistical claims of significance – in which case you will need to collect quantitative data – or are you looking for rich, deep data with which to conduct a thematic analysis? This should drive the type of question, and response format, of your survey.

Activity 110

We have already included one example of a questionnaire used in investigating human relationships (the Passionate Love Scale). What other examples can you find?

Issues of responsibility

- Researchers must keep responses confidential and anonymous so that participants feel confident reporting on sensitive issues like human relationships. However, for the purpose of your class practical, no sensitive issues will be investigated due to the fact that students are trainee researchers. Ensuring confidentiality also reduces the risk of causing psychological harm such as embarrassment.
- Participants must provide informed consent before beginning a questionnaire, must be offered the right to withdraw during the process and must be debriefed afterwards.

Possible research questions to investigate using a questionnaire about human relationships

- How do people of different ages (for example, parents and teenagers), define love?
- Is there a gender difference in ways people show love or signal attraction?
- What makes people feel like they belong in a group?
- How do people experience acculturative stress, and what steps do they take to mitigate it?

After your class practical

Once you have completed your class practical, reflect on your experience. With hindsight, consider if a survey was actually the most appropriate form of research method for the topic you investigated. What alternative method(s) could you have used? No research method is perfect, and each will have its own strengths and limitations. Can you explain what some of the limiting aspects of surveys are and how the advantages of an experiment, interview or observation might address some of these limitations?

Class practical: example

Note: For the purpose of the class practical, an established survey is cited that can be utilized by a teacher, or teachers may work with students to make up their own.

Research proposal Investigating the differences in a sense of belonging between students who have been at a school for a long time compared to students who have recently joined.

Research method This study will use a survey (Goodenow, 1993) to gather data about students' sense of belonging at school. The survey used will be the Psychological Sense of School Membership (PSSM) survey, as developed by Goodenow (1993). Results will be compared between students who have been at the school for greater than two years to students who have been at the school for less than two years. Statistical analysis will be conducted to see if there is any significant difference.

Ethical considerations

- **Sensitive subjects:** A sense of belonging to school may be a sensitive subject if participants are not feeling like they belong at school or if the process of moving schools was traumatic. Care should be taken when introducing the topic, and the right to withdraw or not participate must be made clear.
- **Informed consent:** Participants must be made aware of the content of the survey before taking it. This will allow them to make an informed decision to opt out if it may cause them psychological distress.
- **Right to withdraw:** Participants must be informed about their right to withdraw from the study at any time. No justification is required of participants to exercise this right.
- **Responsible use of data:** Researchers must consider how they will use the findings of the study in a responsible way. This may include how the findings may be used to improve conditions for new students starting at a school.

Participants Participants in a cohort of students (for example, all year 11 students) will be given the survey.

Participants selection method A head of grade will be approached and asked if the survey may be administered during a homeroom period by students in the psychology class. Including time for gaining informed consent and a debrief, this is estimated to take 5–10 minutes.

Procedure

- 1 Participants will be read a plain language statement with information about the study so that they can make an informed decision about whether or not to participate.
- 2 Participants will sign an informed consent form.
- 3 Participants will fill out the PSSM (Goodenow, 1993). For the purpose of this study, a question should be added about the years the student has attended the school (greater than or less than two years). If the psychology class or teacher wish to investigate other variables, questions to address these could be added in as well.
- 4 Surveys will be collected and participants thanked for their time and debriefed.

Data analysis method As this survey gathers quantitative data, statistical analysis is appropriate. A measure of central tendency, the mean and the standard deviation between the two groups should be calculated. It would be interesting to also conduct an inferential statistical test to see if there is a significant difference between the means of the two groups. As this is an independent sample design, and the conditions to conduct parametric tests cannot be assumed to be met, a Mann–Whitney U test is the most appropriate test to conduct. This test will allow the researchers to answer if there is a significant difference in a sense of belonging felt by students who have been at a school for a long time (greater than 2 years) compared to students who are more recent arrivers (less than two years).

Reference for survey

<https://youthrex.com/wp-content/uploads/2019/10/PSSM-Scale.pdf>

HL extensions

The role of culture in shaping human behavior in the context of human relationships

Note: You should be able to discuss and explain how culture can affect human relationships in some way. This is one example of how culture can have an effect on human relationships. You are not required to learn this material for an examination.

Culture influences relationships in many ways. It is apparent when looking at the role of culture in interpersonal relationships. One way to study interpersonal relationships is to consider views on love and marriage. Lindholm (2006) has defined romantic love as an intense attraction that involves the idealization of the other. When looking for the definition of love, the answer will depend on the culture you find yourself in. Consider how perceptions and portrayals of love are communicated in your culture (Figure 3.42).



Figure 3.42 Bollywood actors Rakesh Bapat and Richa Pallod star in the Indian Hindi-language romantic movie *Kaun Hai Jo Sapno Mein Aaya*.

Activity 111

How do you define love? Is it different from your classmate sitting next to you? What about the depictions of love you see in the media you consume? Discuss what love means to you.

From an academic perspective, Hatfield and Rapson (1994) define different types of love, including passionate and compassionate love, but even these look different depending on one's cultural context and the impact it might have on your human relationships. A common way to investigate the role of culture in human relationships is the preference for marriage types, either "love" marriages, where two people fall in love and then get married, or "arranged" marriages, where the families of the people involved find suitable matches for them to marry. The reality is that this is a reductionist view of marriages. There is some degree of choice in arranged marriages (they are not forced – forced marriage is illegal in most of the world); the bride and groom are often given some options to end the courtship before the marriage. Similarly, in love marriages, people are often introduced to each other by friends or family members. It is not unusual for relatives or friends to "set up" a meeting that might appear accidental but is actually part of a plan to get together people who should make a successful partnership. It is best to think of marriages on a continuum with love at one end and arranged at the other.

Key study

Gupta and Singh (1982)

Aim To investigate the role of type of marriage on people's love and satisfaction with their relationship.

Method In a longitudinal study, they studied 100 professionals working in Jaipur, India. Fifty participants had found their match through their families (arranged) and the other 50 were in love marriages. They compared participants' feelings of love, using Rubin's love scale, and satisfaction with their marriages at one year, five years and ten years after their weddings.

Results The results can be seen in Figure 3.43 .

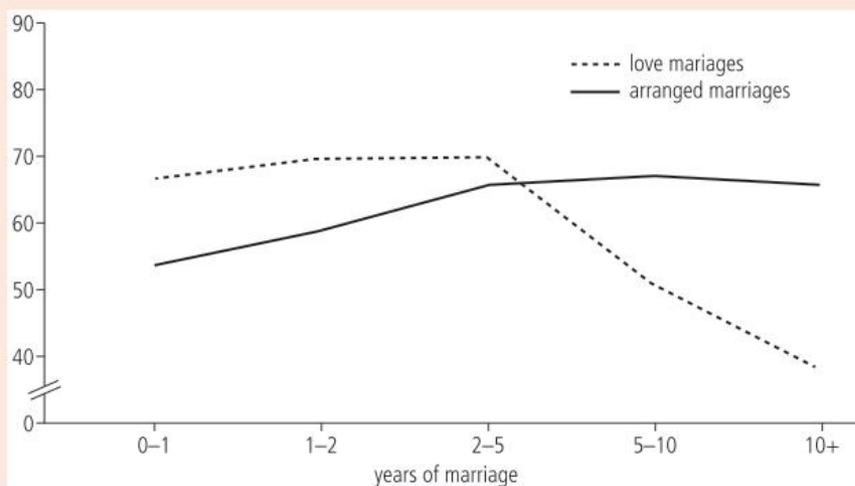


Figure 3.43 Different types of marriages follow different trajectories when it comes to feelings of passionate love.

Conclusion Figure 3.43 shows that love marriages start off with intense feelings of passionate love, but this decreases after about two years of marriage. In arranged marriages, there is a "slow burn": feelings of love increase for the first five years before plateauing, but they remain higher than in love marriages in the long term.

This reflects what sociologists have been telling us about relationships for a long time. The idea that love is something that is needed for marriage is a very Western concept, but the idea that love can grow and be the product of a successful arranged marriage is a very non-Western idea. In fact, Levine et al. (1995) found that in more individualistic countries, the absence of love alone was a sufficient reason to end a marriage. Whereas Huang (2005) studied the rapid increase in divorce rates in Asian countries and summarized the causal factors as:

- lessening of social/parental control over marriage
- rapid urbanization and the stress of modern life
- increasing leniency or abolition of divorce laws
- increasing importance of romantic love
- enhanced choice of partner through exposure to more people through education and employment
- growth of individualism through globalization.

Activity 112

Research the top ten reasons for divorce in your own culture. Compare with another group or student who has a different culture. Does one gender initiate divorce more than the other? What might be the reasons for this?

In the West, a marriage is often seen as a declaration of love between two people, while in the rest of the world, it is often a celebration of the joining of two families and is connected with economic and social obligations and support (Dion and Dion, 1993).

In a study of a highly globalized population – the Indian diaspora in the USA – Regan et al. (2012) found through a survey that for 58 couples, half of which were in love marriages and half of which were in arranged marriages, there were no significant differences in ratings of marital satisfaction, passionate or committed love. This blending of relationship styles, particularly within this Indian-American community, has recently been explored by the hit Netflix show, *Indian Matchmaking*.

CONCEPT: Measurement

There are issues of *measurement* when researching the effect of culture on relationships. Many empirical studies use subjects in the USA, and often university students, for their sample and try to generalize their findings universally. However, we know that culture influences the types of relationships we seek and what we find attractive. This is only amplified in a globalized world as different cultures influence each other and the types of relationships we form.

It is also very difficult to conduct experiments on human relationships: you cannot manipulate the variable of marriage to measure a direct variable to see a cause-and-effect relationship. This makes most of the research on human relationships, particularly cross-culturally, correlational. A lot of data about interpersonal relationships is self-reported, often through interviews and surveys, meaning that there are issues around the social-desirability effect and other demand characteristics – nobody likes to see themselves as a bad partner. Additionally, there may be some confirmation bias at play. If someone is in a bad relationship but there are many barriers to leaving, they may prefer to self-justify why they stay in the relationship, rather than report all the negatives.

Are predictions in the human sciences inevitably unreliable?

TOK

CONCEPT: Bias

There are many *biases* at play in research on human relationships. We have covered sampling biases and issues with recruiting largely Western university students for these studies, but there is also a heteronormative bias, which means most of the research looks at heterosexual relationships. There is sparse research on queer relationships and how behavior might differ within them. There is also a bias towards monogamous relationships, when polygamist and polyamorous relationships exist across the world. Some commentators suggest this too is better thought of as a spectrum, with monogamous relationships at one end and polyamorous ones at the other. Dan Savage has famously advocated for “monogomish” relationships, where people in committed, love-filled relationships do not worry so much about the occasional instance of intimacy with others, within agreed upon and transparent guidelines.

HL practice questions

1. Explain one issue that limits the interpretation of the data in Gupta and Singh (1982).
2. Analyze the findings from the Gupta and Singh (1982) study and state a conclusion linked to the claim that culture can shape human behavior in the context of human relationships.
3. Choose **one** of the following:
 - i. Discuss how the researchers could improve the credibility of the findings.
 - ii. Discuss how the researchers could avoid bias.
 - iii. To what extent are the findings transferable to other populations or contexts?
4. To what extent can we conclude that culture may have a positive effect on human relationships? Refer to at least two pieces of research discussed in this chapter.

The role of motivation in shaping human behavior in the context of human relationships

Note: You should be able to discuss and explain how motivation can affect human relationships in some way. This is one example of how motivation can have an effect on human relationships. You are not required to learn this material for an examination.

Motivation influences many of our behaviors within human relationships. When looking for motivational strategies to change individual behavior, the mere knowledge of a shared group identity can increase one’s motivation to cooperate with group members (Brewer, 2007).

**Conceptual question**

How does your motivation *change* or *cause* you to form human relationships?

SIT helps explain why we are motivated to cooperate with members of our own group. For example, it can be assumed that people are willing to cooperate with their group as long as it provides them with a positive social identity. When this is not the case, and people are offered the possibility of changing group membership, they will be tempted to do so (Doosje et al., 1999). This involves a clear ongoing cognitive process as the individual constantly measures the perceived quality of the group as well as the extent to which they are considered a member of it. Both will reflect on the individual's sense of self-worth relative to the group, because the group's success can bring about benefits for their self-identity. Therefore, there is a clear link between the success of the group and the maintenance of a positive sense of self.

The motivation to contribute to the group is increased when group members behave in ways that help the group to function more effectively. Tyler and Blader (2001) identified three types of cooperation within ingroups:

- the following of group rules
- conducting work on behalf of the group
- an intention to stay within the group.

Activity 113

Think of a group you have been a part of in which you were not particularly motivated to cooperate or to work prosocially to support the group. Work through Tyler and Blader's (2001) types of cooperation. Were you motivated by any of them? What other things can be done to motivate people to cooperate within groups?

However, while intention is primarily cognitive in nature, there is also a social element. If intention is not signaled clearly enough, it might be assumed that the individual lacks motivation to cooperate within the group.

Tyler and Blader (2001) argue that the extent to which an individual identifies with the group will directly affect their motivation to cooperate with ingroup members. **Identification** refers to the degree to which people cognitively merge their sense of self and the group identity. It can be expected that when people identify more with their group, they will be more willing to act cooperatively. For example, they will invest more time and energy in working toward group success, in terms of mandatory but also discretionary behavior. The stronger the identification with the group, the more important it is to the individual for the group to succeed (Figure 3.44).



Figure 3.44 When people are motivated to cooperate in groups, greater things can be achieved than when individuals work alone.

Key study

Tyler and Blader (2001)

Aim The researchers aimed to measure the influence of identification on the degree to which people were motivated to cooperate with group members.

Method The researchers defined identification as the individual's cognitive intermingling of self and group. They asked participants (404 employees (50:50 male to female ratio) with an average age of 30, who worked in a variety of settings chosen to maximize variation in the level of instrumental investment in the work environment) to complete a questionnaire anonymously, assessing on a scale of 1–6 the extent to which they defined themselves in terms of their work group membership. For example, they were asked to respond to statements such as: “My work is important to the way I think of myself as a person”, “When someone praises the accomplishments of my work organization, it feels like a personal compliment to me”, “When I talk about where I work, I usually say we rather than they”.

Cooperative behavior was investigated by self-report and was measured according to levels of compliance, deference and discretionary behavior. For example, participants were asked how much they thought they followed the rules, implemented their supervisor's directives even when unobserved, exerted “full effort” in their roles, volunteered to help others, helped their supervisor, and the extent to which they were considering leaving their place of work. They were also reverse scored on the extent to which they thought they completed substandard work and hindered their supervisor.

Results The researchers found that people's identification with their group has an important role in motivating their behaviors within that group. Identification is a strong and significant predictor of compliance, deference and discretionary behavior. Extra-role behavior shows an especially strong effect for identification. People who identify most with their group are more likely to be motivated to cooperate, less likely to engage in uncooperative behaviors and more likely to engage in discretionary behaviors, even when they are not being observed. This has large implications for the world of work when organizations are trying to motivate their employees.

Conclusion This research on motivating people to cooperate with members of their ingroup suggests that creating strong, cohesive ingroup membership is what is needed to motivate individual behavioral change. However, other motivational strategies are also supported by research. The mere existence of socially comparative groups leads to competitive behavior (Festinger, 1954). According to social comparison theory, individuals are motivated by a basic drive to improve their performance and minimize discrepancies between their and other individuals' performance. Thus, competitiveness is one manifestation of the social comparison process.

TOK

What are the main difficulties that human scientists encounter when trying to provide explanations of human behavior?

Activity 114

Think about the last group assignment you had to do. What steps did your teacher (or you yourselves as group members) put in place to help motivate you all to cooperate within the group? Was it effective in getting the job done?

Garcia et al. (2013) argue that comparison concerns are the prime motivator for competitive behavior. These are defined as the desire to achieve or maintain a “superior relative position”. However, it can be noted that their notion has a definitive quality to it; is more accurate to state the *perception* of a superior relative position rather than an absolute relative position.

Comparison concerns are dependent on:

- the relevance of a performance dimension to the individual (Tesser, 1988), meaning competitiveness increases the more relevant the activity is to the individual
- the degree of the individual’s similarity to the target (Kilduff et al., 2010), meaning competitiveness increases the more similar the individual is to their rival
- the degree of the individual’s closeness to the target (Pleban and Tesser, 1981), meaning competitiveness increases the closer the individual is to their rival.

Taylor and Moriarty (1987) conducted a study to investigate the motivating role of competition and physical distinctiveness in interracial conflict. It was predicted that the tendency to favor the ingroup over the outgroup is enhanced when groups are competitive rather than interdependent, and when groups are racially dissimilar rather than racially similar. Fifty-six white female college students who were enrolled in a psychology course at the University of Maryland (USA) participated in return for extra course credit. As each participant arrived for a session, they were given a numbered card in a seemingly random fashion. However, by prearrangement, the numbers assigned to the participants were always even (two and four), while those for confederates were always odd (one and three). They were told that the purpose of the study was to investigate the efficiency and performance of small working groups. They were then informed that for the first part of the study they would be divided into two small groups, each of which would work on identical tasks for the same amount of time. The researcher then announced that participants holding even numbers (naive, or actual, participants) would be members of one small group, while those holding odd numbers (confederates) would be members of the other small group. Thus, it was possible to ensure that the ingroup was always white, while the outgroup was either white (similar-race condition) or Black (dissimilar-race condition). It was determined in pre-tests that participants were equally likely to believe in the randomness of their partnership assignments whether the outgroup was white or Black. The relationship (interdependent or competitive) between the two small groups was then manipulated.

Interdependent conditions: Participants were told that any solutions to a problem devised by each small group would be combined in such a way as to provide the best overall solution to the task. If this combined solution met a predetermined standard, members of both groups could win a prize. It was emphasized that both groups could win.

Competition conditions: Participants were told that any solutions devised by each small group would be compared in order to determine which solution came closest to meeting a predetermined standard. The members of the group with the better solution would win a prize. It was emphasized that one group would win and one group would lose.

The problems to solve were “reading a case history of a delinquent adolescent and recommending an approach to his rehabilitation” and “writing an advertising slogan for a new brand of toothpaste”. Participants were then asked to rate their mood toward their ingroup and outgroup. The questions were designed to disguise the true purpose of the experiment.

The researchers found that significant ingroup *bias* occurred under all conditions. Participants exhibited greater ingroup bias in competition conditions than in interdependent conditions. Participants in competitive conditions exhibited both increased ingroup attraction and decreased outgroup attraction. Participants' attraction for both the ingroup and the outgroup was influenced by competition.

This research suggests that even weak ingroup identity can motivate people to show ingroup bias. For example, merely telling two strangers that they were members of one small problem-solving group led to significant ingroup preference in all inter-group conditions. However, an element of competition can enhance ingroup bias and lead to decreased outgroup attraction.

CONCEPT: Measurement

There are issues of *measurement* with Taylor and Moriarty's (1987) study. The demographic homogeneity of the participant group (white female university students in the United States) means caution should be used when generalizing the findings. Furthermore, Western societies have become more multi-ethnic since 1987 (the year of the study) and people may now identify less with their ethnicities, which could lessen the impact on intergroup competition. However, the study does put a difficult subject on a secure empirical foundation.

Previous studies have also shown the phenomenon of physical distinctiveness affecting intergroup competition. For example, Andreoli and Worchel (1978) operationalized physical distinctiveness as differences in dress, so participants in two groups either dressed similarly (both groups wore white lab coats) or dressed dissimilarly (participants in one group wore white lab coats, while subjects in the other group wore red lab coats) (Figure 3.45). It was found that distinctive groups in a competitive relationship were least attracted to each other. Therefore, competition decreases ratings of attractiveness between groups who are seen as physically distinctive.



Figure 3.45 Reducing physical distinctiveness (for example, by dressing alike) can increase motivation to cooperate in groups.

HL practice questions

1. Explain one issue that limits the interpretation of the data in Tyler and Blader (2001).
2. Analyze the findings from the Tyler and Blader (2001) study and state a conclusion linked to the claim that motivation can shape human behavior in the context of human relationships.
3. Choose **one** of the following:
 - i. Discuss how the researchers could improve the credibility of the findings.
 - ii. Discuss how the researchers could avoid bias.
 - iii. To what extent are the findings transferable to other populations or contexts?
4. To what extent can we conclude that motivation may have a positive effect on human relationships? Refer to at least two pieces of research discussed in this chapter.

The role of technology in shaping human behavior in the context of human relationships

Note: You should be able to discuss and explain how technology can affect human relationships in some way. This is one example of how technology can have an effect on human relationships. You are not required to learn this material for an examination.



Conceptual question

How has technology *changed* the way that you interact in your human relationships?

Many forms of technology have influenced the way we conduct our human relationships.

One piece of revolutionary technology has been the invention and widespread use of swipe-based dating applications (SBDAs). Within these applications, users are prompted to create their own profiles by uploading pictures of themselves and answering a few demographic and informative questions. They are then presented with a profile of a potential match. The users then have the option of either “swiping left” if the user is uninterested in meeting the potential match or “swiping right” if the user would like to make a connection. Each SBDA has its own unique feature and they can be targeted to different markets, but the underlying principles of how they operate are the same.

Activity 115

A textbook trying to describe SBDAs to young people seems out of date. Can your class create a list of SBDAs you know about? What aspects do they share, and what are the unique features of each?

A study by the Pew Research Center said that three in ten American adults have used a SBDA and that these figures are higher for young people and members of the LGBTQ+ community. Sharabi (2021) used unstructured interviews to investigate why people use SBDAs and found that a common experience was to “skill up” their

dating game and get exposure to a lot of potential matches very quickly, with one participant talking about using SBDAs as their dating “training wheels”. Sharabi (2021) characterizes many users as being in different parts of a “download and delete” cycle, where they would often create profiles on many apps at once, use them for a period of time until they reported “dating burnout” and then delete them.

Sharabi (2021) also reported on the most effective type of profile pictures to use to secure long-term relationships from SBDAs. Of their participants who entered committed relationships after meeting through SBDAs, Sharabi (2021) reported that when meeting their match for the first time, those in now committed relationships report that their match either met or exceeded their expected physical attractiveness rating. This suggests that it is more effective to post a recent, realistic photo in your profile rather than a heavily manipulated one or one from your past. Profile pictures often also contain information about the type of relationships male users may be seeking. Zinck et al. (2021) found that male SBDA users who uploaded pictures with their dependents (or possible dependents) were more likely seeking committed relationships, while men who were seeking short-term relationships were more likely to upload photos with their dogs.

In a study investigating what people were looking for when seeking matches on SBDAs, Schroeder and Fishbach (2024) found that most people wanted a partner who was willing to support them and listen to them. However, they also found that there was not much evidence of people listing these qualities in their own profiles. This mismatch between what people say they want and what they themselves put in their profile does not seem to be affecting the efficacy of SBDAs in forming relationships. Sharabi’s (2023) study also found that participants who were in committed relationships who met online thought that this matching mechanism actually brought them closer together, as these SBDAs are centered around self-disclosure, which can create feelings of intimacy.

While many SBDAs are developed and used in Western societies, there is evidence to suggest that they play a similar role in other cultures as well. Ye (2006) conducted a content analysis on online dating ads (a precursor to SBDAs where websites are populated with static profiles) posted by American and Chinese users. Ye (2006) found that most of the ads posted by American users contained information about people’s hobbies and personalities, while the Chinese ads were more focused on financial status, education, health and physical appearance. These findings were replicated in what the ads said the person was looking for in a potential match as well.

Other examples of how culture can influence the use of SBDAs abound. The largest SBDA is Shaadi.com, based in India and largely centered on helping Indian people find potential matches and marriage partners. It has been observed that while users of SBDAs in the West often create their own profiles and use these apps for themselves, in many non-Western societies, it is often parents who use them to try to secure matches for their children.

Activity 116

Investigate the *swayamvara* system in ancient India and contrast this with the approach of Shaadi.com.

How does the use of numbers, statistics, graphs and other quantitative instruments affect the way knowledge in the human sciences is valued?

TOK

One new technology influencing how we form and maintain human relationships is AI. A recent study by the Match Group (owners of Match.com, a dating website and owner of many SBDA) suggests that in the past year, 6 percent of SBDA users have used AI in their online dating. Of these users, the study found that 43 percent used it to enhance their profiles and 37 percent used it to help write their first message to a potential match. These users who are employing AI in their online dating are finding mixed results: about a quarter report receiving more matches and the same amount report getting better matches. However, this suggests that three quarters of AI users in online dating are not getting these things. AI, just like many other technologies may only be useful if people are using it effectively.

However, perhaps what differentiates AI from **digital technologies** that came before it is the rapid pace of change. While using AI to write your SBDA profile or create witty messages to potential matches might not yet be a great idea, it might be once these large language models have had a few more years of content input into them. In a recent paper with the tongue-in-cheek title of “Should ChatGPT Write Your Breakup Text?”, Fu et al. (2024) conducted semi-structured interviews with 21 participants on the role of AI-mediated communication tools in the breakup process. The researchers found that while current AI is not very good at sensitive human communications such as break-up texts (and therefore is not recommended), there may be a role for AI in the future of these communications. Participants saw that the future role of AI in breakups could be to help them make sense of their relationship breakdown, help them craft the right communications in terms of word choice and tone, and offer support and companionship, as well as provide a tool for reflection and growth to speed up the recovery process.

Wu and Kelly (2020) researched the intersection of SBDA with AI and their impact on human relationships. The researchers noticed that a commonly reported issue with SBDA was that people struggled to create profiles which reflected themselves in a positive light, and that they had a bias towards people who could express themselves creatively and articulately. The researchers comment on the role here for AI to help people shape profiles that better reflect themselves when they are at a loss for words. The independent samples experiment examined how potential matches perceived the involvement of AI in profile generation on users' attractiveness and trust. Forty-eight participants were given ten dating profiles and told that they were written either solely by a human or with the help of AI. This study found that the perceived involvement of AI did not influence the ratings of attractiveness of the profiles, but it did significantly reduce the trustworthiness of the user who was reportedly using the AI to enhance their profile. This study suggests that there may be a significant cost to a SBDA user revealing the use of AI to create their profile to potential matches.

CONCEPT: Responsibility

Investigating people's dating and romantic lives carries a great deal of responsibility for researchers. As this is a sensitive topic, care must be taken to protect participants from psychological harm and distress. Researchers must also be mindful of how their results are used by industry and the wider public and ensure results are not distorted. This is particularly true in a world with AI. The ethics of using AI in one's dating profile is only beginning to be discussed and the implications it has on online dating, as well as researching online dating, is yet to be seen.

Activity 117

Are there any SBDAs designed with young people in mind? If you were designing and launching a SBDA for people your age, what features would it have? How would you uphold your responsibility as a psychologist to ensure it operated ethically, as well as avoided bias, unlike so many SBDAs before it?

Key study**Holtzhausen et al. (2020)**

Aim To investigate how the infiltration of technology into human relationships is associated with negative mental health outcomes.

Method The researchers used a cross-sectional online survey of 437 participants to investigate whether adult users of SBDAs had higher levels of mental health issues than non-users. They particularly focused on levels of psychological distress, anxiety, depression and self-esteem. Of the participants, 30 percent were current SBDA users, and 78 percent of participants who were using or who had used SBDAs in the past had met someone face-to-face after meeting via a SBDA.

Results More participants who had used SBDAs reported a positive impact on self-esteem (40 percent) compared to a negative impact (29 percent). However, that is about where the good news stops. Users of SBDAs were significantly more likely to have psychological distress, anxiety and depression. Increased frequency of use and longer periods of use were both significantly associated with higher levels of psychological distress and depression.

Conclusion While the researchers acknowledge that this is an under-researched area, it does call for greater investigation into what healthy use of SBDAs could look like.

Critical thinking

The research on SBDAs should be treated with some degree of skepticism. There are issues of *measurement* and accuracy, as there are when investigating any sensitive issues such as dating. What controls are in place to ensure participants are being honest? Is the social-desirability effect too likely to occur for researchers to make valid conclusions? What steps can researchers take to minimize the chance of *bias* influencing their results and make their results more credible and valid?

Research on SBDAs is also associated with many negative behavioral traits and has seen a rise over the same period of phenomena such as “ghosting”, “catfishing” and “gaslighting”. The rise in these phenomena, while appearing at the same time as the rise of SBDAs, shows that there is a correlation but not necessarily a *causation*. There is also the issue of addiction to SBDAs. Does dating app behavior truly represent a relationship, or could technology add an addictive component to the behavior and use of the app?

HL practice questions

1. Explain one issue that limits the interpretation of the data in Holtzhausen et al. (2020).
2. Analyze the findings from the Holtzhausen et al. (2020) study and state a conclusion linked to the claim that technology can shape human behavior in the context of human relationships.
3. Choose **one** of the following:
 - i. Discuss how the researchers could improve the credibility of the findings.
 - ii. Discuss how the researchers could avoid bias.
 - iii. To what extent are the findings transferable to other populations or contexts?
4. To what extent can we conclude that technology may have a positive effect on human relationships? Refer to at least two pieces of research discussed in this chapter.

[End of HL extension section]

Context: Human relationships Concepts–Context practice questions

Bias

- 1 How might cognitive biases, such as confirmation bias or cultural bias, affect the way individuals perceive their own relationships or group affiliations, particularly in the context of SIT?
- 2 In what ways can gender or cultural biases influence conformity within groups, and how do these biases affect interpersonal relationships and group dynamics?
- 3 How might biases such as researcher or participant bias influence studies on human relationships, such as those investigating acculturation or romantic relationships, and how can researchers mitigate these biases?
- 4 How could SIT and the concept of ingroup favoritism lead to implicit biases within close personal relationships, such as family or romantic partnerships?
- 5 In the context of acculturation strategies, how might cognitive biases such as availability bias or representativeness bias shape individuals' perceptions of cultural integration, separation or marginalization?

Causality

- 1 How does the bidirectional nature of cause-and-effect in acculturation influence the formation of human relationships within immigrant communities?
- 2 In studies of romantic relationships, how might the complexity of causality (including interaction effects of hormones, cognition and culture) challenge the understanding of why relationships succeed or fail?
- 3 How might reductionism in studies of conformity and group dynamics limit the understanding of cause-and-effect relationships in shaping individual behavior within social groups?

- 4 In examining the effects of cultural dimensions (individualism vs. collectivism) on interpersonal relationships, how do issues of bidirectional ambiguity complicate our understanding of whether culture causes relationship behaviors or vice versa?
- 5 How do internal and external validity concerns affect the ability to establish causal links between SIT and human relationships in experimental studies?

Change

- 1 How do planned and unplanned changes in behavior affect the development of trust and communication within romantic relationships?
- 2 How might acculturative stress influence the formation and adaptation of new relationships in immigrant communities, and what strategies can be employed to promote positive change in these relationships?
- 3 To what extent does individual agency in choosing a partner (as seen in love marriages) promote a different kind of change in relationships compared to culturally determined or arranged marriages?
- 4 How do theories of change in human behavior apply to overcoming barriers in improving group dynamics and reducing conflict in intergroup relationships?
- 5 In what ways can intrinsic motivation to change unhealthy relationship behaviors (such as poor communication or trust issues) contribute to long-term relationship success?

Measurement

- 1 How can the operationalization of variables such as trust and affection help in measuring the success of romantic relationships?
- 2 What are the challenges in using self-reported data to measure emotional states in romantic relationships, and how might triangulation improve the reliability of such measurements?
- 3 How could longitudinal and cross-sectional research designs be used to study the long-term effects of acculturative stress on interpersonal relationships?
- 4 In what ways can interpretive approaches, such as content analysis of couples' conversations, help in understanding the role of communication in maintaining relationship satisfaction?
- 5 How does measuring hormonal activity using brain imaging techniques contribute to our understanding of attachment and bonding in romantic relationships?

Perspective

- 1 How can biological, cognitive and sociocultural perspectives together provide a more complete understanding of interpersonal conflict in romantic relationships?
- 2 In what ways does the sociocultural approach help explain the influence of cultural norms and values on marriage types (for example, love marriages vs. arranged marriages)?
- 3 How might a cognitive schema influence one's perception of trustworthiness in group dynamics, and what role does SIT play in reinforcing ingroup bias in relationships?
- 4 To what extent does the biological approach (for example, hormonal activity) explain the emotions experienced during passionate love, and how can these be moderated by sociocultural factors such as cultural norms around intimacy?

- 5 How does acculturation affect the formation of romantic relationships in multicultural societies, and how can emic and etic research perspectives help in studying these processes?

This question blends the concept of acculturation with methodological perspectives to examine relationships in a cross-cultural context.

Responsibility

- 1 How can SIT help explain the responsibility of psychologists in reducing stigma when studying human relationships across different cultural groups?
- 2 In what ways can ethical standards, such as informed consent and debriefing, affect the results of research on romantic relationships, especially when using methods like self-report or observational studies?
- 3 How should psychologists balance the need for informed consent and the use of deception in research investigating group conformity and acculturation processes in multicultural societies?
- 4 What responsibilities do psychologists have when publishing findings on culturally sensitive issues, such as marriage types or relationship satisfaction, to avoid reinforcing stereotypes or causing social harm?
- 5 How might the ethical considerations of protecting participants from harm influence the methodology of studies on acculturation stress and group behavior within marginalized communities?

Learning and cognition

Introduction to learning and cognition

Part of what sets humans apart from other animals is their deep capacity for complex learning and cognition. While many animals can learn to press a lever for food or to avoid threatening stimuli, only humans can engage in the complex cognition involved in learning multiple languages, solving simultaneous equations and thinking about our thinking, or metacognition. Some of the learning processes that apply to other animals also apply to humans; classical and operant conditioning have both been shown to change behavior in a range of animals, including humans. However, there are more complex learning mechanisms that are unique to humans, such as the creation of schemas, or mental representations in our minds, as well as social learning, or learning by watching others.



Our thinking and decision-making are prone to biases, and the dual system model of thinking and decision-making helps us to conceptualize how we may jump to conclusions without doing enough thinking before making a decision. However, biases in our thinking do serve evolutionary purposes; they allow us to make quick decisions that have helped us survive for thousands of generations. So while they may distort our thinking in some respects, they do serve a purpose. It is important to understand when, and how, they may influence our thinking so that we can make better decisions equipped with this information. These questions of the reliability of our cognitive processes continue to interest psychologists working in the field of learning and cognition.

You should have an understanding of the areas of study in Table 3.22.



Thinking and learning

Area of study	Learning objectives
Cognitive biases	The role of one or more cognitive biases in decision-making.
Conditioning (classical and operant)	Examples of classical and operant conditioning as a way of learning. Application of operant conditioning to change behavior.
Dual processing model	The value of the dual processing model for understanding thinking and decision-making.
Schema theory	The role of schema in behavior and/or cognition.
Social learning theory	The role of social learning theory in learning. Application of social learning theory to change behavior.

Table 3.22 Thinking and learning learning objectives from Subject Guide, page 32.

Cognitive biases

One bias that can affect decision-making is anchoring bias. Anchoring bias refers to the human tendency to rely too heavily on the first piece of information (the “anchor”) encountered when making a decision. This initial information sets a reference point, and subsequent judgments are made by adjusting away from that anchor, often insufficiently. This cognitive bias affects various types of decision-making, including financial, sociocultural and personal decisions.

For example, Tversky and Kahneman (1974) investigated the effect of anchoring bias on participants’ ability to estimate the number of countries in Africa who are members of the United Nations (Figure 3.46). The researchers found a high anchor made participants significantly more likely to estimate a high number rather than a low one.

Further research has shown that initial salary offers, for example, have a strong anchoring effect on the final agreed-upon salary, illustrating the influence of anchoring bias in practical settings. The anchoring and adjustment heuristic has been used in promotional activities such as signs stating, “limit: 12 per customer”, which tends to result in people buying more than if the signs states, “limit: 6 per customer”.

Anchoring bias also applies to education. Caverni and Pérès (1990) conducted an experiment in which 48 teachers (participants) were given sets of students’ essays to be graded, along with a list of the students’ fictional grades. The higher the mean of the fictional grades, the higher the grade given by the teachers for the essays they graded. The fictional grades were the teachers’ “anchors”. They affected the teachers’ judgments, and the distorted grades given were the “adjustment” or the changed behavior.

Anchoring bias demonstrates how initial information, even if arbitrary, can significantly influence subsequent judgments and decisions. This highlights the need for awareness and strategies to mitigate its effects in critical decision-making processes.

You can read more about this study, and anchoring bias, on pages 52–53.



Are observation and experimentation the only two ways in which human scientists produce knowledge?





▲ **Figure 3.46** Do you know how many African countries are in the UN? Would you be influenced if you knew there were 33 member states in Latin America and the Caribbean? What if you knew there were 53 member states in the Asia-Pacific?



Conceptual question

How might anchoring *bias* have changed your grades in the past? What would you want your teachers to know about anchoring bias?

Critical thinking

Many factors influence people's decision-making, not just cognitive biases such as anchoring *bias*. For example, Tversky and Kahneman (1974) found that **third-culture kids** (young people who find themselves living in a different culture to their parents' culture), or those who have high exposure to the forces of globalization, may be less influenced by the irrelevant anchor when estimating the number of countries in Africa, as they have more confidence and competence in international geography.

The causes of decision-making in this case are influenced by people's life experiences and episodic memories, as well as cognitive biases. This reveals the multifaceted nature of *causality*, and shows that that in any psychological phenomena, there are a multitude of causal factors that interact in complex ways. Tversky and Kahneman acknowledge these other influences in their writings on "bounded rationality", or the idea that we can't know everything about everything and make rational decisions on that basis – some of us know more about international geography (like third-culture kids or those who work across-borders) and can therefore make better decisions in tasks such as estimating the number of countries in Africa; others will have stores of other types of information in their long-term memories and make better decisions in other areas.

Conditioning (classical and operant)

You can read more about classical conditioning on pages 53–54.



Conditioning is another word for learning. Classical conditioning is a form of learning first researched by Ivan Pavlov in Russia and concurrently by John Watson in the USA in the early 1900s. The findings from these early researchers are often credited with starting the behaviorist movement, which viewed people (and all other animals) as being products of their environment and without free will to control their destinies: people's lives were controlled by their environments and the stimuli within them. This perspective is captured by the famous quote by John Watson, who said:

Give me a dozen healthy infants, well-formed, and my own special world to bring them up in, and I'll guarantee to take any one at random and train him to become any type of specialist I might select — doctor, lawyer, artist, merchant-chief, and yes, beggarman and thief. (Watson, 1913).

What Watson meant by this is that by creating a certain type of environment, he could foster the traits and characteristics needed to follow any path in life.

Behaviorists are particularly concerned with how stimuli (environmental factors) affect responses (observable behaviors). Classical conditioning, often called learning by association, is one example of how learning occurs according to the behaviorist approach. The learning process happens when two stimuli are paired together repeatedly: a response that is first elicited by the second stimulus is eventually elicited by the first stimulus alone. Essentially, it is learning new behavior via the process of association. For example, imagine children lined up for an immunization at your school. The first child cries when the needle goes in, then the next child cries, then the next child cries, and so on, until the children are crying when they merely see the needle – they have no idea if it will be painful to them, but they have associated the needle with pain.

TOK

How might the beliefs and interests of human scientists influence their conclusions? How can we know when we have made progress in the search for knowledge in the human sciences?

Activity 118

What have you been classically conditioned for? Do you have any automatic behaviors when you hear the school bell? Or when you can smell the freshly baked bread coming from the cafeteria?

In Watson's (1913) famous "Little Albert" study (Figure 3.47), he took the infant child of his secretary and showed the baby many items that adults might consider fear-worthy, such as a scary mask, fire and a white rat. Little Albert was not frightened by these objects. Then Watson showed Albert a neutral stimulus, a white rabbit, and at the same time, he hit a very loud gong, producing an innately frightening sound. Watson produced these two stimuli together multiple times until Little Albert had learned that the appearance of the white rabbit meant a frightening, loud sound was coming and feared the white rabbit alone. Albert had been classically conditioned to fear the white rabbit. Moreover, this learning was generalized to objects similar to the neutral object (for example, other fluffy white things like the white rat).

Watson's (1913) study raises many issues around the *responsibility* of psychological researchers, one of which is using participants who cannot give informed consent. "Little Albert" was an infant, and could not consent to taking part in the research.

Watson did gain consent from his mother; however, his mother worked for Watson as a secretary, so there was an unequal power relationship between them, which raises questions about whether she could give consent freely.



Figure 3.47 Little Albert had no natural fear of white rabbits, but by the time Watson had paired a loud gong with the presentation of a white rabbit numerous times, the child burst into tears and crawled away from anything white and fluffy.

Activity 119

With a partner, discuss at least three other issues of responsibility raised by Watson's (1913) study. Share your ideas with another pair and see if you had any similar or even different ideas.

Researching at the same time on a different continent, Ivan Pavlov (1896) was investigating how dogs were learning to associate food with the ringing of a buzzer. Eventually, the dogs learned that the buzzer meant food was coming, and they would produce saliva at just the sound of the buzzer. Pavlov was initially interested in salivation and how much dogs salivated during digestion of food (an inherited reflex). He realized that over time the sight of food was enough for the dog to produce saliva – then, so was hearing the footsteps or hearing the dish being put down. He devised his test to find out what was happening. Once the dog starts to salivate at the buzzer alone, this is a conditioned response because it has been learned through classical conditioning (Figure 3.48).

Activity 120

Doves and peace, Cedar trees and Lebanon, Japan and sushi, apples and New York City, coffee and Melbourne... It seems we have learned to associate many things through classical conditioning. What other examples can you think of? Is this the only way we learn? How might other *perspectives* explain these associations (for example, a biological or sociological perspective)?

Behaviorism was a reactionary movement against the focus on the unconscious in psychodynamic theories such as Sigmund Freud's psychoanalysis in the late 1890s.

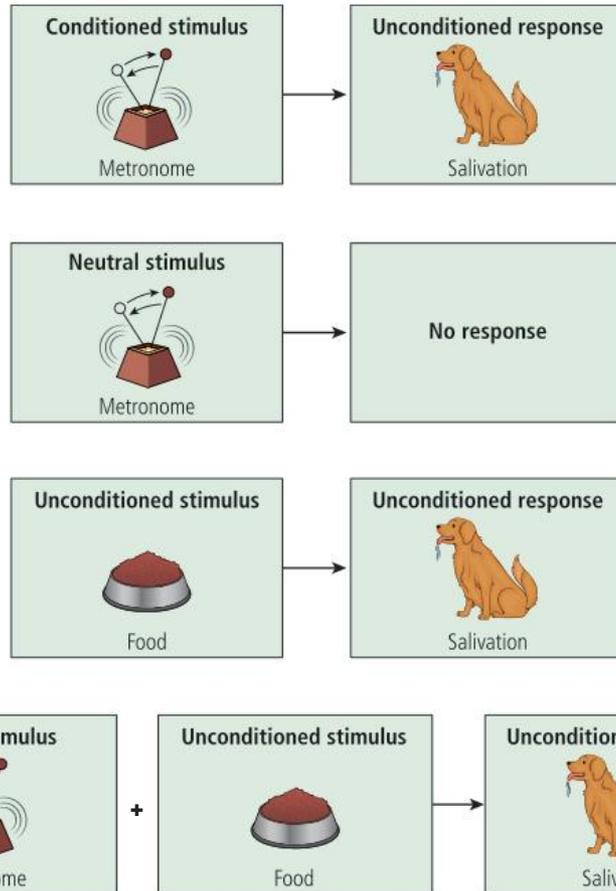


Figure 3.48 Classical conditioning.

Behaviorists thought researchers should ignore what happened in the “black box” of the mind, as it was subjective and could not be verified, and instead focus on objective, observable, overt behaviors that could be documented and *measured*. Behaviorists focused on how behavior could be acquired and modified through the manipulation of environmental stimuli.

Another form of behavioral conditioning is operant conditioning. This work was built on the foundational “Law of effect” coined by Thorndike in 1898, which stated that any behavior that was followed by a pleasant consequence was more likely to be repeated, and any behavior that was followed by an unpleasant consequence was less likely to be repeated. Operant conditioning, sometimes called instrumental conditioning, proposes that the consequences (reinforcements or punishments) of a behavior produce changes that either increase or decrease the probability of the behavior being repeated (Table 3.23).

Operant conditioning has other associated outcomes. For example, if a behavior is not followed by a consequence, then it will not be shown; this is called behavioral extinction. If a behavior is punished, it is not unlearned; it is merely suppressed and will return when the punishment is no longer present. Consequences can be generalized to other behaviors too; if we are praised for working hard in English, we may also work hard in math to try to receive more positive reinforcements.

Contrary to popular belief, Pavlov never used a bell to train dogs to salivate. Instead, he relied on precise stimuli like a metronome, harmonium and buzzer, as these allowed for more control over timing and intensity in his experiments.

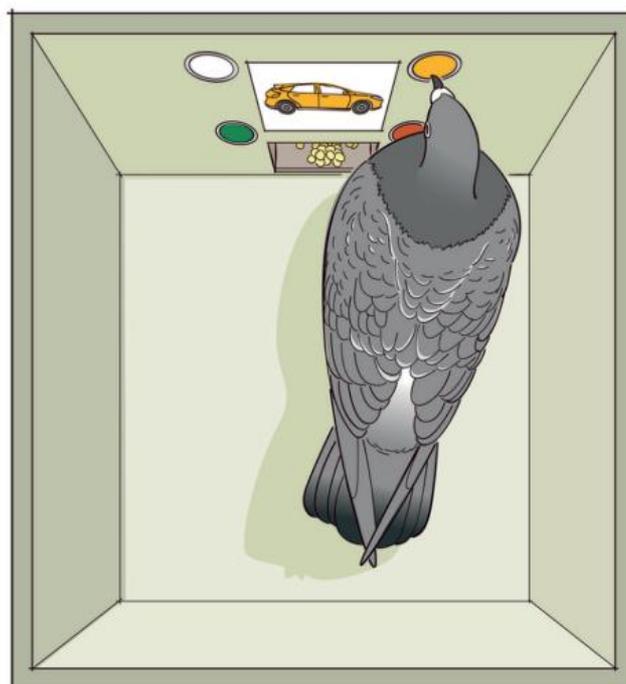
You can read more about operant conditioning on pages 60–62.

	Reinforcement (increase likelihood of behavior)	Punishment (decrease likelihood of behavior)
Positive (add something to the situation)	<p>Something added to the situation to increase the likelihood of the behavior.</p> <p>Examples: praise for demonstrating school values and achieving good grades, pocket money for doing chores, positive feedback.</p>	<p>Something added to the situation to decrease the likelihood of the behavior.</p> <p>Examples: fines for speeding, suspensions for violent behavior at school, being told off for lying.</p>
Negative (remove something from the situation)	<p>Something removed from the situation to increase the likelihood of the behavior.</p> <p>Examples: a car stopping beeping when you buckle your seatbelt, removing sprinting drills from a soccer training session if the whole team works hard.</p>	<p>Something removed from the situation to decrease the likelihood of the behavior.</p> <p>Examples: removal of freedom by being sent to jail after committing a crime, taking away a phone if it is being used inappropriately.</p>

▲ **Table 3.23** Variables involved with operant conditioning.

The impact of these consequences was detailed in Skinner's classic experiments using pigeons in puzzle boxes. Skinner deprived pigeons of food to make them hungry, then placed them in a "puzzle box" (a cage with a lever that the pigeons could press with their beaks) with a chute for providing food (Figure 3.49).

► **Figure 3.49** A pigeon in Skinner's puzzle box.



In one experiment, Skinner released a food pellet every five seconds, regardless of what the pigeon was doing. He found that the bird associated whatever random action they were performing prior to the food appearing as the source of the positive reinforcement of the food. This finding is often generalized to human superstitious behavior, where we look for some causal link between our behavior and the outcome of a situation, even when no link is present. For example, a soccer player might have the superstition of not washing their socks before big matches, or some people might cross their fingers before a test is presented to them in the hope that it will make it full of easier questions.

In another experiment, Skinner put a hungry rat into a puzzle box where the lever they could push with their foot was hooked up to the food-delivery chute. The rat quickly learned that by pushing the lever they would receive food (a positive reinforcement). Skinner demonstrated negative reinforcement by causing an unpleasant electric current to move through the floor of the box; only by pressing the lever could the rat turn the current off. The rat quickly learned to press the lever to remove the current (a negative reinforcement).



Conceptual question

Behaviorists have based most of their findings on studies of nonhuman animals. How do our *responsibilities* to be ethical researchers change when we are using nonhuman animals as participants?

Activity 121

Can you think of examples of where operant conditioning has shaped your behavior? Would you be studying so hard right now if there wasn't the positive reinforcement of a grade at the end of your IB exams?

Critical thinking

Classical and operant conditioning have been widely applied in many areas of psychology. They have found uses in sports psychology (in encouraging athletes to perform at their best) and in behavioral modification therapy (to help people decrease unwanted behaviors). Schools are environments that draw heavily on the principles of operant conditioning, and they help to illustrate how different consequences can lead to different behaviors. As schools house children, the use of any behavioral change program must be considered *responsibly*, and the ethical implications of shaping children's behavior should always be considered. If you are being bullied, and your behavior of fighting back stops you being bullied (a negative reinforcement: the removal of the bullying), you are more likely to increase your violent behavior and use it as a way to solve other problems. However, if fighting back against your bully gets you a detention and a call home to your parents (a positive punishment: the addition of a detention), then you are less likely to try this problem-solving strategy in the future. Similarly, if a student is exhibiting an unwanted behavior such as interrupting a class, a teacher may try to ignore this behavior (adding no consequence) in an attempt to make the behavior extinct. Although this is often easier said than done!

Other applications of operant conditioning include token economies. If you have ever received a token – or a sticker or a star or a checkmark – for exhibiting a behavior in line with your school values, then you have been part of a token economy. A token economy is when some value-free “token” is collected and later swapped out for a reward (for example, if a class collects 100 marbles in a jar, they get a pizza party).

Classical and operant conditioning raise issues of behavioral *change*. They are very effective in creating short-term behavioral change. For example, giving a primary student a checkmark next to their name for helping another student in the playground may encourage that behavior in that school. However, if they move to high school and this token economy does not exist, this conditioned behavior may soon become extinct.

Token economies and operant conditioning have been particularly useful in settings with extreme behavior that is difficult to manage, such as in prisons and psychiatric facilities. While the use things like the removal of yard privileges for violent prisoners are effective in reducing violent behavior in prison, this behavioral change is often not sustained when these individuals re-enter society and nobody is rewarding their good behavior or punishing their bad behavior.

When individuals learn the token economies, they can manipulate the rules to their own ends. Consider, for example, a young child who has a sticker-based reward system set up at home and earns stickers each time they perform a desired behavior (Figure 3.50), such as packing up their toys, playing nicely with their sibling or not throwing their food on the floor. Any astute young child will quickly learn that by creating a situation their parent wishes to avoid (having a tantrum in public, for instance) they can create the opportunity to be awarded stickers. The system may actually lead to an increase in undesired behaviors in the child's quest of reinforcements and tokens.



Figure 3.50 Rewards charts are common examples of token economies and rely on the principles of operant conditioning.

Dual processing model

You can read more about the dual processing model on pages 59–60.



Kahneman (2011) proposed a dual system model that explains the difference between two types of thinking: system 1 (intuitive thinking) and system 2 (or rational thinking).

Activity 122

Initiate a discussion with friends and list ten decisions that were taken by prominent world figures such as heads of very large companies, religious leaders or government leaders. Suggest whether the decisions were made spontaneously by the person or by a consultative process (that is, with other people).

In the best-selling book, *Thinking, Fast and Slow*, Kahneman (2011) proposed a model of thinking made up of two types of thinking systems. These systems are summarized in Table 3.24.

System 1: Intuitive		System 2: Rational	
Looks like	Is good at	Looks like	Is good at
Relatively fast Intuitive Emotional Seemingly automatic Requires minimal cognitive effort Influenced by bias and perhaps schemas Uses associations and metaphors to quickly reach a simple representation of reality	Comparing and contrasting objects Identifying the source of a sound Completing a common phrase such as “as quiet as a . . .” Displaying an emotion in response to a stimulus, such as smiling at a funny mouse cartoon Solving simple math problems such as “the square root of 16” Reading text on a sign	Relatively slow Rational/logical and therefore calculated Purposeful Requires more cognitive effort and therefore more time Less influenced by prejudice, bias and schemas Uses reasoned beliefs and choices to slowly reach a less simple representation of reality	Preparing to dive into a swimming pool Directing attention to one actor on a stage of many actors Looking for a person who has been described in an airport arrival area Recognizing a familiar voice Determining appropriate behavior in a social setting Evaluating several similar products, such as smartphones Interpreting a logical conundrum

Table 3.24 A summary and examples of the two types of thinking outlined by the dual processing model.



Kahneman and Tversky are clearly experts in thinking and decision-making research but be aware that their work is monocultural and so it may not be possible to transfer their conclusions to wider populations. Be cautious when describing all studies' results and generalizing their conclusions. This raises the issue of sampling *bias*: we cannot necessarily generalize findings from a small group of people who share similar characteristics to wider populations.

This theory has been interrogated by the large body of work by Kahneman and Tversky on flawed, illogical decision-making, and is supported by other researchers. For example, Kivetz and Simonson (2003) asked 85 Americans aged 18 to 80 whether they would prefer a lottery prize of \$55 in cash or a \$50 bottle of wine. They found that 24 participants (28 percent) chose the wine rather than the cash. The study concluded that people made the seemingly irrational decision of choosing the wine – even though if they had chosen the cash, they could buy the wine and have \$5 extra – because if they won the \$50, they would spend it on a necessity rather than a luxury.

Activity 123

Think of a recent decision you made, such as how you selected your IB subjects, or why you chose to study IB Psychology. With the advantage of hindsight, would you describe the decision as accurate? How did you make the decision? Slowly and carefully, using a lot of cognitive effort, or quickly?

Critical thinking

It is widely believed that rational thinkers give the time and effort needed to make correct decisions, while intuitive thinkers tend to make impulsive and emotion-driven decisions and are therefore less likely to make correct decisions (Figure 3.50). However, this is not supported by research and is criticized as a monocultural *perspective*. Strohschneider (2002) considered the effect of cultural factors on decision-making by using the results of two empirical studies that investigated complex decision-making by participants in India and Germany. According to Strohschneider (2002), thinking toward decision-making is not an innate skill – that is, we are not born with this ability; it must be learned through value systems, family practices, socialization practices and patterns of schooling. Strohschneider (2002) found that there are culture-specific decision-making processes, developed according to the environment's functional requirements. Differences in predictability and certainty lead to differences in the “strength” of decisions, or decisiveness. The cost of incorrect decisions, attitude toward risk, and assertiveness are all likely to differ across cultures and lead to different decision-making styles.

Most of the research supporting the dual processing model, and the different *biases* in thinking that support it, are conducted in Western societies, raising issues of generalizability of their findings – although, more recently, Nobel Prize laureate Richard Thaler has been using the internet to research apparently irrational decision-making cross-culturally to see how culturally bound this view of decision-making is. Most of the research conducted by Kahneman and Tversky used mainly US and Canadian university students, yet they extrapolate their findings to “everybody”. A related criticism is that many of the studies may merely indicate participants' poor math/numeracy skills, rather than any other underlying construct.

Phillips et al. (2016) conducted a meta-analysis to determine whether intuitive or rational thinking is more likely to result in accurate decision-making. With a combined sample of 17, 704 participants from 89 studies, their meta-analysis found no significant difference in the accuracy of decisions made using either intuitive or rational thinking. This suggests that people apply the most appropriate thinking style to decision-making situations.

Figure 3.51 Mice using their system 1 for decision-making may rush to retrieve the cheese, whereas mice who have activated their system 2 process may question why cheese has been left out for them.



There are also issues of *causality* around the concept of the “rational human” as championed by economists and thinkers in this field. Economists suggest humans behave in a rational way to maximize their resources with the information available to them. However, this section alone demonstrates a plethora of research which shows that this is not the case. If you were asked to think of a time when you behaved against your best interests – even when you knew it was – could you? If a whole model is based on a flawed assumption about human behavior, one must question the validity of the model.

Activity 124

Use the internet to investigate Nobel Prize laureate Richard Thaler and his work relating to apparently irrational decision-making. To what extent are these seemingly irrational decisions likely to be culture-bound or culture-affected? Would the findings of these studies apply in all cultures?

Schema theory

A schema is a mental representation of an event. Details that do not fit into the general mental representation may be deleted (forgotten) or adapted (changed) to match the schema. Humans are cognitive misers; that is, they minimize the time and energy they put into thinking whenever they can. Schemas save us lots of time and energy from thinking about things.

Schema theory proposes that people give meaning to new experiences by fitting them into schemas previously stored in long-term memory. Morton et al. (2020) suggested that schemas encapsulate the common features of events and so allow for predictions relating to new, similar situations. There is little common agreement on a definition of schemas (Sadoski et al., 1991). Here, though, schemas are defined as tools that allow information to be processed relatively quickly and with minimal cognitive effort. Alba and Hasher (1983) identified five processes that are part of all schema theories.

- **Selection:** The process that selects information for storing and representing.
- **Abstraction:** The process that stores an event’s meaning.
- **Interpretation:** The process through which background knowledge is used to help comprehension.

What values determine what counts as legitimate inquiry in the human sciences?

TOK

For more on schema theory, see page 62.



Be cautious with assertions. Although schemas are well supported, they are not proven to exist, nor are they universally defined.



- Integration: The process by which a mental representation is formed.
- Reconstruction: The process that uses details from the event and general knowledge to refabricate the event.

Bartlett (1932) referred to the “effort after meaning” that people make to try to convert information that they cannot comprehend into a form that they can: “... it is fitting to speak of every human cognitive reaction—perceiving, imaging, remembering, thinking, and reasoning—as an effort after meaning” (Bartlett, 1932, cited in Roediger, 2003). The tendency to use metaphors and similes in language, such as describing someone as “quiet as a mouse”, is an example of “effort after meaning”.

Schema theory proposes that details which do not fit into the general mental representation may be deleted (forgotten) or adapted (changed) to match the schema. Bartlett (1932) found that when asked to retell the War of the Ghosts, an Indigenous American legend, some Cambridge University (UK) participants seemed to adapt it to fit the more culturally familiar fairy-tale schema, beginning their retelling with “Once upon a time” and ending it with a moral of the story, as well as changing unfamiliar words such as “canoe” for more familiar ones such as “boats” (Figure 3.52).

Bartlett (1932) was conducted almost a century ago when psychological methodological standards were not as stringent as they are today. For example, Bartlett did not control the amount of time between retellings of the stories for different participants. Some were asked to retell the story days later and some weeks later.



Figure 3.52 Participants’ schemas influenced their memory of the unfamiliar story, and they replaced unfamiliar concepts with more familiar ones – for example, substituting “boat” for “canoe”.

Another way to think about schemas: Our brains are trying to process complex, unfamiliar information and make it fit ways of knowing that we are already familiar with. You and your teachers probably use schemas all the time in your learning. If you have looked at a diagram of a brain or used an app to see a 3D model of your brain, this is a schema – it is a simplistic rendering of a complex object or process. Bartlett (1932) thought schemas could be made about everything and could help us understand and explain all forms of behavior.

Another example of schemas helping us learn is pattern recognition. A pattern can be any recognizable set of external stimuli, such as a short piece of music associated with a television advertisement, a person’s facial features, components of language, or the mouse character in this book’s cartoons. Any newly detected external stimuli are recognized against previously stored information.

TOK

To what extent has research such as Bartlett (1932) been influential, despite being based on weak methodology? Is Bartlett (1932) a case of “Argument from False Authority”?

Activity 125

Ask someone to draw a simple but actual object – for example, the cup they are using or the book they are looking at. Observe whether they draw “the” object or a mental representation of the object (“a” cup or “a” book). To what extent is this an application of schemas?

Gestalt psychology is largely based on the concept of forming global wholes from collections of separate elements, such as interpreting a simple stick figure as a person.

Apophenia is the irrational tendency to recognize patterns that do not exist, such as faces in burnt toast, the man in the moon and the ancient Greeks’ constellations (Figure 3.53).

i



Figure 3.53 Apophenia is the tendency to find a connection between unrelated or random ideas or things. While our brains are meaning-making machines and some of this is a natural part of the human condition, when it is relied upon too heavily, it can lead to beliefs in conspiracy theories.

Critical thinking

Schema theory has been widely applied and helps us understand and address a large range of issues such as stereotyping, prejudice, discrimination and inaccurate or unreliable memory. Although it is a widely used term, and has generated a large body of evidence, the term “schema” has no universally agreed upon definition. This means the theory lacks construct validity and raises issues of *measurement*. If we do not all agree on what we are talking about, how can we be sure we are measuring the same thing? Also, schema theory describes but does not explain how and why schemas are formed. The theory does not explain why information that does not match a person’s schemas can be forgotten, or distorted to match schemas.

Schemas are active processes and are the result of the active recalling of something from our memory. Therefore, as two people never have the same lived experiences or long-term memories, their schemas will be organizing and processing information in different ways, leading to *bias*. Two students in

the same lesson may have very different recollections of what happened in that lesson. Schemas are a reductionist means of understanding the world. This can be a good thing, as it provides us with a starting point in understanding complex phenomena (like the functions of the brain or how an electric car battery works), but it can also be a potential source of bias as it excludes some information in the name of simplicity (such as falsely remembering the word “boat” instead of “canoe”).



Conceptual question

How do your schemas shape your *perspective*? Is your perspective merely the product of your schemas?

Social learning theory

SLT (Bandura, 1977) proposes that behavior is modeled by other members of a social group and acquired through observation or imitation based on consequences of a behavior. This occurs through the following processes.

- **Identification:** Individuals are more likely to learn from observing others they identify with, such as parents, siblings, peers and celebrities. This is seen in Bandura’s (1977) study in which boys replicate the behavior of male role models more than female role models, and girls replicate the behavior of female role models more than male ones.
- **Modeling:** People learn behavior via observation of a role model. For example, a child may learn study habits from observing and imitating an older sibling.
- **Attention:** In order to learn a behavior, the individual must pay attention to the model. Factors that influence attention include the attractiveness or the authority of the model.
- **Retention:** Before an individual can imitate a behavior, the observer must actually remember the behavior that was observed. The more a behavior is observed, the more likely it is to be remembered.
- **Motor reproduction:** To be able to imitate an observed behavior, the individual has to be physically able to reproduce the behavior. This is influenced by self-efficacy and the extent to which the individual is able and has the confidence to carry out the behavior.
- **Motivation:** An individual may remember and be able to carry out the observed behavior, but they may lack the motivation to do so. In order to imitate the behavior, the individual must understand what the potential outcome of repeating the behavior is. This is referred to as outcome expectancies. If the observer witnesses the model being rewarded for the behavior (vicarious reinforcement), they may then carry out the behavior in the belief that they will receive the same reward. Vicarious reinforcement assumes that observing another person being rewarded or punished for a behavior leads the observer to alter their own behavior based on the observed outcomes. This type of learning is “vicarious” because the observer does not directly experience the reinforcement or punishment, but rather learns from seeing it applied to someone else.



Theories and models are simplified explanations of human behavior. These theories are often adapted over time as research attempts more detailed explanations. Being simplifications, they come with limitations as well as strengths. Always offer balanced discussions of theories and models.



You can read more about SLT on pages 79–81.

A mnemonic is a tool which aids memory, it often uses a pattern of letters, ideas or a melody to help you remember something. For example, using the tune of "Twinkle Twinkle Little Star" to learn the alphabet.



Activity 126

Come up with a mnemonic to help remember the different factors that affect whether or not a model will be imitated based on SLT.

- Attention
- Retention
- Motivation
- Identification
- Modeling
- Motor reproduction

The application of SLT in language learning

SLT is involved in the process of enculturation. Enculturation is the process of acquiring a culture's norms. It is how we learn the "rules" of our culture and what is expected by our group members. Enculturation affects the way we learn language. Pinker (1994) proposes that children begin life being aware, to some extent, that the sounds their parent or guardian produce are elements of a language and that those sounds have meaning, as compared to sounds such as a door closing, which do not have meaning. Others, however, believe that language is a cognitive consequence of enculturation.

Tomasello and Rakoczy (2003) propose that while children's understanding of language occurs ontogenetically (naturally emerging in a holistic way) in all cultural settings at about one year of age, the understanding of beliefs occurs some years later, and at different ages in different cultural settings. There is strong evidence that participating in language-based communication with other people (social learning) is a necessary condition for a child's development.



Culture is not the same as ethnicity or nationality. Use specific language to be clear about this, for example, "the way children of the Samoan culture learn the nuances of their language is affected by the way they are 'encultured', that is, by the way they acquire the norms and expectations of their Samoan culture".

Key study

Ochs (1982)

Aim To investigate the role of social learning in language acquisition by Samoan children.

Method The researchers conducted a longitudinal case study by observing 23 children under 6 years old from different households every five weeks over a ten-month period.

Results They found that language instruction was conducted by a child's caregiver, most often an older sibling, and that it was characterized by three culture-laden features: (1) decentering, (2) a lack of expansion by caregivers, and (3) elicited imitation. They also noted that higher-status people, such as parents, did not lower their perspective to communicate with lower-status people, such as children.

Conclusion The researchers showed that Samoan culture places great emphasis on learning by observation, so the cognitive process of language acquisition by Samoan children is affected significantly by their families' cultures. For example, as Samoan children learn to become members of their culture, they also learn to become competent users of their language, meaning enculturation and language acquisition occur simultaneously. The way they use language is a significant part of their enculturation.

Traditional Samoan culture places great emphasis on learning by observation (Figure 3.54), so the cognitive process of language acquisition by Samoan children is significantly affected by their families' and community's cultures and by the process of learning that culture. The way the children's caregivers use language while being observed by the children affects the way the children learn about their culture's norms. This means that child–parent communication is often “child-to-parent-to-caregiver-to-child”, so that children observe the cultural status of their parent but observe the language of their caregiver, most likely a slightly older sibling. This demonstrates SLT in action in the process of language acquisition.



Figure 3.54 Children in Samoa learn how to fish via a different observational learning process than children in other cultures such as the USA or Europe.

Within Samoan culture, people believe they have little control over their own actions. For example, they tend to say, “legs walk”, “hands write”, “mouths eat” and “the head is dizzy”, and they have no vocabulary for “individual” or “personality” (Ochs, 1982). This means that Samoans are less inclined to communicate with their children. Children are not treated as socially responsive beings (that is, they are not considered cooperative), and they are not considered to be in control of themselves and their actions. The vocal utterances of Samoan children are treated as sounds rather than the beginnings of language.

Is it possible to eliminate the effect of the observer in the pursuit of knowledge in the human sciences?

TOK

Critical thinking

Ochs (1982) offers a contrasting *perspective* in research using SLT. It has strong ecological validity because it was conducted in the children's home setting and over a significant time period. Both genders were included in the study and the age range of the children was appropriate for the study of language acquisition. There were, however, just a small number of participants and they were all of the same culture, so caution is required in generalizing the study's findings.



Conceptual question

Researchers can adopt an emic or etic approach when researching cross-culturally. How might this *perspective* impact the results of a study such as Ochs (1982)?

Activity 127

Think about a group you belong to, for example, a sports team, drama club or service organization. What are three "unwritten rules" of that group? Write them down and then discuss with the person next to you. Are there similarities to the types of things involved in the enculturation to different groups, or are the processes for each group unique?

The application of SLT in changing behavior

SLT assumes that portions of an individual's knowledge acquisition can be directly related to observing others within the context of social interactions.

A classic example of SLT being applied to explain behavior is aggression. SLT can explain how children may learn aggressive responses if they observe parents, siblings or media characters resolving conflicts through aggression and receiving positive outcomes for such behavior. For example, a boy playing a violent video game with violent male characters might learn aggression through identification with the characters and observing and imitating their actions, especially if these characters are perceived as attractive or authoritative. Retention of aggressive behaviors occurs as these actions are repeatedly observed. Motor reproduction might come into play as the boy feels capable of mimicking these actions, influenced by his confidence. Motivation to display aggression in real life could be fueled by the perceived outcomes or rewards seen within the game.

Activity 128

Can you identify five things you do that you have learned by observing others, perhaps family members or school friends? It may be a way of thinking, talking or walking. It may be the way you tie your shoelaces or eat your breakfast. How could you design a piece of research to determine that social learning was the cause of these behaviors?

Therefore, interventions involve exposing children to models who demonstrate constructive conflict resolution skills. Programs can teach children empathy, communication skills and ways to negotiate or solve problems without aggression, thereby modeling positive social interactions. For example, the US-based Positive

Action program is an evidence-based initiative designed to instill life skills in students from preschool through high school. It focuses on social-emotional learning, emphasizing the link between positive thoughts, actions and feelings to foster a constructive cycle in everyday life. Through its curriculum, students learn to navigate real-world situations effectively, covering essential life skills such as creativity, honesty, and time and emotional management. This program has shown significant outcomes, including reductions in substance abuse and improvements in self-concept and self-control in vulnerable children by utilizing principles of SLT such as engaging students in observing, modeling and practicing positive actions and then reinforcing the learning through imitation and the rewards of positive feedback.

SLT can explain how students often learn effective study habits or become motivated to excel academically by observing peers who study diligently and receive praise or high grades (Figure 3.55). Therefore, schools and educators can create environments where positive academic behaviors are modeled by peers or teachers. Older students can mentor younger ones, for instance, demonstrating effective study strategies and motivating them through their own success stories.



Figure 3.55 Positive academic behaviors are modeled by peers or teachers.

Activity 129

Apply your mnemonic from the activity on page 288 to explain why some people may want to imitate Beyoncé, for example, and then do the same for a role model (or anti-role model) of your choice.

Criteria	Beyoncé	Role Model
Attention		
Retention		
Motivation		
Identification		
Modeling		
Motor reproduction		

SCT's basic hypothesis is that people learn some behaviors by observing others' behaviors and the consequences of those behaviors.

According to SLT, exposure to violent television programs, movies and video games may influence children to be more violent. But is this so? The results of studies on the effects of televised violence are inconsistent, raising issues of *causality*. By observing aggression, children learn how to be aggressive in new ways, and they also draw conclusions about whether being aggressive to others will bring them rewards or punishment. Huesmann et al. (2003) carried out a longitudinal study, monitoring children's behavior over a 15-year period. They found a positive correlation between the number of hours of violence watched on television by elementary school children and the level of aggression demonstrated when they were teenagers. They also found that those who watched a lot of television violence when they were 8 years old were more likely to be arrested and prosecuted for criminal acts as adults.

However, because the study is only correlational, no cause-and-effect relationship can be concluded. Also, it is not possible to eliminate dispositional factors from the study. Perhaps children who had a biological predisposition to violence watched more television. The study suffers from bidirectional ambiguity. We cannot know whether watching violent television programs makes children aggressive or whether aggressive children watch more television.

You should have an understanding of one or more of the following: attention, memory, perception or language.



Cognitive processes

Area of study	Learning objectives
Biological factors in cognitive processes	The role of one or more biological factors in one or more cognitive processes.
Cognitive models	The value of cognitive models to understand one or more cognitive processes. Compare two cognitive models used in understanding one cognitive process.
Cultural factors in cognitive processes	The role of one or more cultural factors in one cognitive process.
Environmental influences on cognitive processes	The potential influence of one or more environmental factors on one cognitive process.
Potential for improving a cognitive process	One or more strategies to improve one or more cognitive processes.

▲ **Table 3.25** Cognitive processes learning objectives from Subject Guide, page 32.

Biological factors in cognitive processes

Acetylcholine (ACh) is a neurotransmitter involved in many processes such as muscle contractions (when present in motor neuron synapses) and the cognitive process of memory (when present in the hippocampus). The main role of ACh is to change the state of neuronal networks throughout the brain and modify their response to internal and external stimuli. The diverse effects of ACh depend on the site of release and the receptor subtypes. However, a common theme is that it has a role in behaviors that are

adaptive to environmental stimuli, as well as decreasing responses to stimuli that do not require immediate action (Picciotto et al., 2012). ACh is also thought to play a role in memory formation.

An agonist is a chemical that binds to a receptor and activates it to provoke a biological response. An antagonist is a chemical that binds to a receptor and blocks it to dampen a biological response (they are sometimes called blockers). The complexity of these chemical interactions make cause-and-effect difficult to establish, but researchers can use agonists and antagonists to manipulate the levels and effects of neurotransmitters (Figure 3.56).

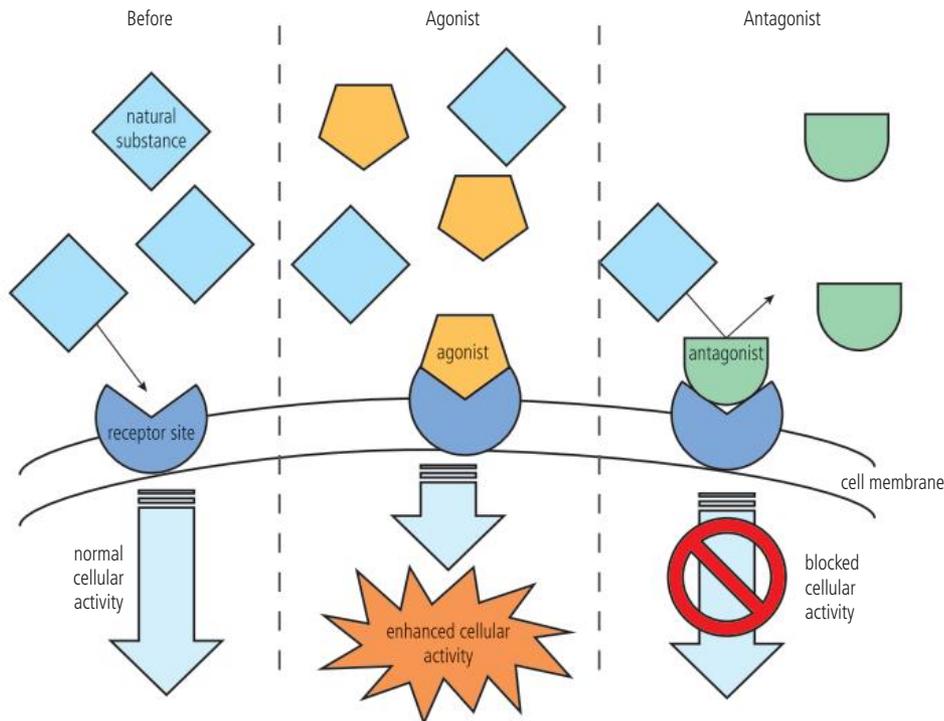
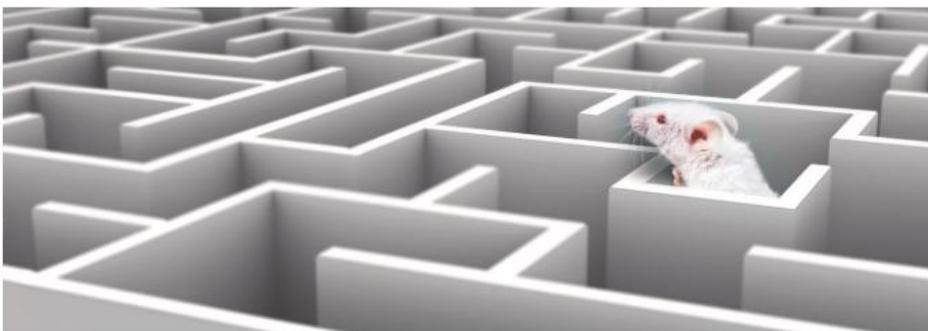


Figure 3.56 This diagram shows regular synaptic transmission in the first column, then what happens when an agonist is present, and then what happens when an antagonist is present in the synapse.

An example of the role of ACh can be seen in Martinez and Kesner's (1991) study investigating the role of ACh in learning and memory. They found that rats who had their ACh boosted by an injection, of an ACh agonist (physostigmine) learned a maze faster than a control group (who had no injection), who in turn learned the maze faster than a group of rats who were injected with an ACh antagonist (scopolamine), decreasing its availability in the synapse.



Critical thinking

This study has a clear IV (levels of ACh) and a clear DV (ability and time taken to run the maze), so the use of an experimental method with a control group makes it possible to establish a cause-and-effect relationship between levels of ACh and memory.

However, the limitation of the research is that it is questionable to what extent these findings can be generalized to humans. However, human research has shown that ACh-producing cells in the basal forebrain are damaged in the early stages of Alzheimer's disease, which suggests that ACh does have a role to play in memory formation in humans. The nervous system involves complex interactions, making clear cause-and-effect with isolated variables difficult to establish.

Experimental evidence suggests that memory processing is mediated by parallel, and to some extent independent, neural systems. Because different memory systems appear to acquire different classes of information, the processing of different attributes of memory may at times come into conflict with one another (White and McDonald, 2002). Therefore, while experimentation through manipulation of clear IVs to measure the effect on clear DVs gives researchers confidence that they can claim cause-and-effect, it is essential that caution is used when coming to conclusions. This study also shows the interplay between issues of *measurement* and issues of establishing *causality*, and why psychology is such an inherently complex science.

While Martinez and Kesner (1991) appear to show a clear link between spatial memory formation and ACh researchers cannot simply conclude that ACh increases memory. The complexity of brain functionality means that researchers must be very cautious when claiming simple cause-and-effect relationships between neurotransmitters and specific responses. McIntyre (2002) suggests that ACh release may reflect activation and participation of the hippocampus in learning and memory, but in a manner that can be detrimental to performance on another brain area such as the amygdala, which is also involved in memory. She was able to measure ACh levels in rat hippocampi. When the levels were high in the hippocampus, the rats were more able to perform spontaneous spatial awareness tasks but less able to perform tasks needing conditioned responses, which are associated with the amygdala. She concluded that ACh can be linked with certain brain areas, such as the hippocampus, which are themselves responsible for certain types of memory, but high levels may impair other functions that require a different type of memory.

Do researchers have different ethical responsibilities when they are working with human subjects compared to when they are working with animals?

TOK



Conceptual question

Acetylcholine's role in memory is well established by studies like Martinez and Kesner (1991). But is it right to claim that the release of ACh *causes* memory?

Cognitive models

The multi-store model of memory

Atkinson and Shiffrin (1968) proposed a simple representation of human memory called the multi-store model (MSM). Their initial model comprised a group of sensory

You can read more about the MSM on pages 56–57.



registers, each linked to the short-term store (STS), which is linked to the long-term store (LTS). The MSM proposes that when an environmental stimulus is detected, it is “stored” very briefly in the appropriate sensory register (or buffer).

If the sensory registers are given attention, the information is passed to the STS, where it may be rehearsed and then passed into the LTS. Once information has been transferred to the short-term memory, it can remain there for up to 30 seconds. Information in the sensory registers that is not given attention, and information in the STS that is not rehearsed, quickly decays and is lost.

According to the model, people detect many environmental stimuli (such as faces or sounds) during the course of a day, and these stimuli are all captured in the sensory register. The model proposes a separate register for each of the senses: echoic register (sounds), iconic register (visual stimulus), haptic register (touch), gustatory register (taste), olfactory register (smell) (Figure 3.57).

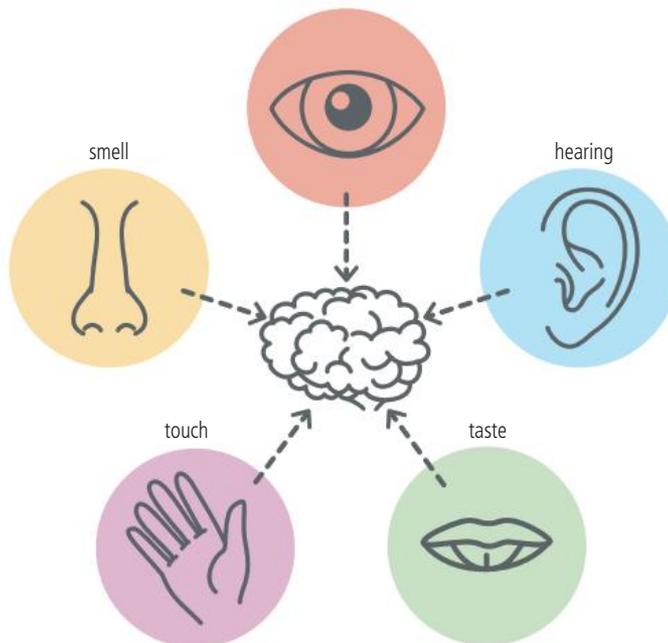


Figure 3.57 According to the MSM, the different senses are perceived by the brain in separate stores before being passed to the STS if attention is paid to them.

Atkinson and Shiffrin (1968) claimed that most information held in the sensory registers quickly decays and is lost, but information that receives attention is transferred to the STS. Attention, in the model’s description, refers to “noticing” in everyday language.

Only some of the environmental stimuli detected every day gets noticed – perhaps a face that looks unusual or familiar, the sound of the school principal’s voice, or a catchy tune. If a stimulus is attended to (given attention), it is transferred from the appropriate sensory register to the STS. The rest (anything that does not get noticed) is not stored. The model also proposes that information can be stored in a different mode to that in which it was first detected. For example, a sound (a spoken sentence, for instance) could be stored as a visual stimulus.



The MSM proposed a separate register for each of the senses.

Activity 130

What are the implications of the MSM's process for remembering information presented during a lesson? How might your teachers want to change your learning behaviors when they are equipped with knowledge of the MSM?

Information that is rehearsed sufficiently can be stored in the long-term or (relatively) permanent memory. The model proposes that the more the information is rehearsed, the stronger its position is in long-term memory. The model assumes that the long-term memory's capacity is limitless in both capacity and duration.

Evidence in support of the MSM

The Atkinson and Shiffrin (1968) model relied on hippocampal lesion studies, which showed that people with damaged hippocampal regions could create short-term memories but not long-term memories. This showed that short- and long-term memory are distinctly different cognitive processes.

Activity 131

As you walk through the school corridor, try to pay attention to all of the material on the walls. When you get to your next classroom, immediately write down everything you saw on the walls. Do the walk again later and see what material you noticed and what you did not notice.

Bekhterev (in Milner, 2005) showed that the medial temporal lobes have a role in memory formation. Bekhterev demonstrated that the brain of a patient who had shown severe memory impairment displayed significant “softening in the regions of the uncus, hippocampus, and adjoining medial temporal cortex”. The strongest evidence supporting the hypothesis that the hippocampal region plays a role in memory formation came from studying patients who had developed amnesia after ablation surgery on the medial temporal lobe as a way of controlling certain types of epilepsy (Milner, 2005).

The hippocampus plays a significant role in the formation of long-term memories, that is, the transfer of information from the STS to the LTS.

Glanzer and Cunitz (1966) used free recall (where participants have to remember as many words as they can in any order) of a list of 20 words to demonstrate that there are two different processes involved in retrieving things from our memory. They showed lists of 20 items, one at a time, and had participants use free recall to recall the words. One group were in the “instant recall” group, with no delay. Participants in this group remembered the first five words and the last three words the best, suggesting that the middle words were held in the STM but were then lost due to interference. In a second experimental group, with a 30-second delay, participants still remembered the first five words well, but were less likely to remember the last three words, as they had disappeared from their STS. The ability of participants to recall the initial (approximately) five words is known as the primacy effect, and the ability to instantly recall the last few words is known as the recency effect.

Activity 132

How can you use knowledge of the primacy and recency effects to increase the effectiveness of your study habits? Would it make sense to read through your notes from start to finish every time, or perhaps to mix up the order and start in different places each time?

Most of Atkinson and Shiffrin's research focused on visual (seen) and aural (heard) stimuli, but the model also included a register for each of the senses including a gustatory (taste) store and a haptic (touch) store (Figure 3.58). Supporting this aspect of the model, D'Esposito et al. (2000) used fMRI images to show that the prefrontal cortex is involved in haptic memory.

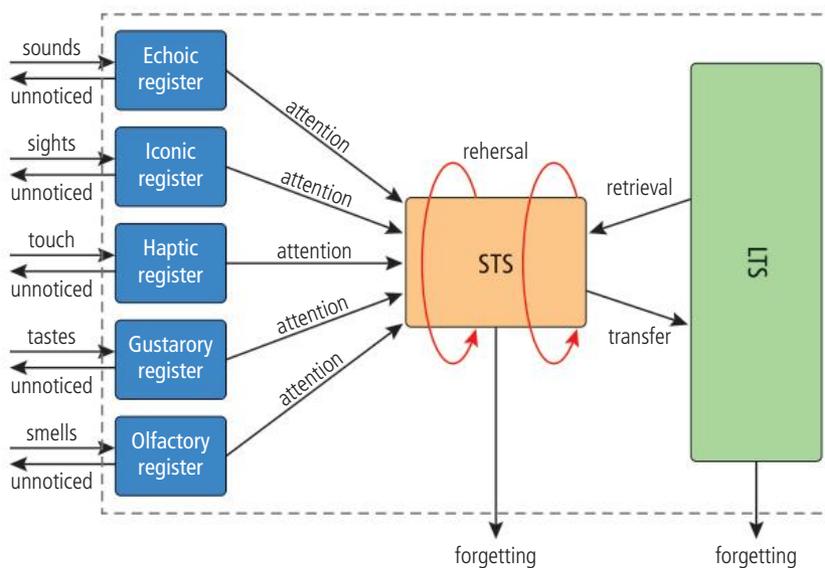


Figure 3.58 Outline of the MSM.

Activity 133

Redraw the MSM as a flow diagram highlighting the flow of information that gets stored in long-term memory and information that is lost or forgotten.

Limitations of the MSM

- The MSM describes rather than explains. It does not tell us why information is stored.
- The model suggests that memory formation processes are grouped and distinct, but lesion studies have shown that memories are spread out in the brain.
- Memory formation processes are more complex than the model implies. The model does not account for how memories are stored based on their importance, nor does it account for the effect of emotion on memory.

- The model does not account for the type of information taken into memory. Some information seems to pass into the LTS more readily than other information. For example, information that is emotional or distinctive in some way is also stored and retrieved more readily.
- Rehearsal alone is too simple to account for the transfer of information from the STS to the LTS. The model ignores factors such as effort and the strategies that people may use when learning. Elaborate rehearsal methods lead to better recall than simple rehearsal.
- The model does not account for the process of forgetting; forgetting is seen as a by-product, rather than an active process.
- The model does not account for the retrieval process. Information storage is only one part of the memory process; in order to be remembered, information must also be retrieved, and this retrieval process must be more complex than represented in the model.

You can read more about the WMM on page 57.



The working memory model

Baddeley and Hitch (1974) expanded this short-term aspect of the Atkinson and Shiffrin model, proposing a three-part working memory model (WMM) that separates primary memory into three components: the phonological loop, the visuo-spatial sketchpad and the central executive (CE). The phonological loop stores sound-based content. The visuo-spatial sketchpad stores visual and spatial information. The episodic buffer stores events or episodes made up of related information such as the sights, sounds and chronologies associated with a particular event. The CE controls cognitive processes, including the flow of information (Figure 3.59).

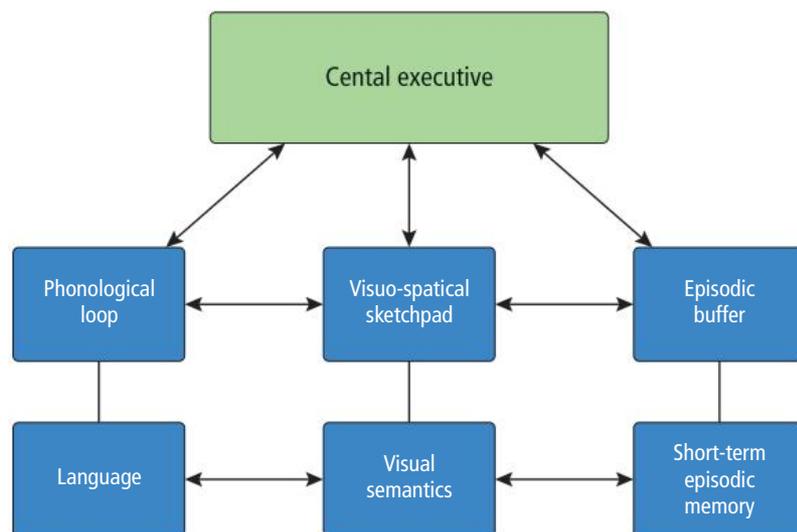


Figure 3.59 Outline of the WMM.

What role do models play in the acquisition of knowledge in the human sciences?

TOK

Activity 134

Look at the front of your school building. How many windows are there? What did your brain do to help you answer that?

Critical thinking

It is helpful to compare the MSM and WMM when thinking critically about them. Table 3.26 shows points of comparison between the MSM and the WMM.

	MSM	WMM
Both see memory as multi-faceted	Three different stores	Three different processes
Both supported by experimental research, establishing <i>causality</i>	Glanzer and Cunitz (1966)	Baddeley and Hitch (1974)
Both supported by biological case study research, demonstrating support using other forms of <i>measurement</i>	Milner (1957)	Shallice and Warrington (1970)
Neither is a comprehensive model of memory	Ignores intricacies of STM	Ignores LTM
Both say information comes in through senses	Sensory store	Senses
Both include some role for rehearsal	Process to move from STM to LTM; model criticized for over-relying on this	Happens in phonological loop
Both developed with a monocultural <i>perspective</i> based primarily on research in the USA and the UK		
Neither addresses the unreliability (distortion) of memory		

Table 3.26 Points of comparison between the MSM and the WMM.



When contrasting in psychology, it is important to look for points of difference. A point of similarity may be raised, but only to acknowledge the limits of the difference between two models.

Cultural factors in cognitive processes

Much of the research into learning and cognition, including cognitive processes, has been done in Western societies. Originally, it was assumed that cognitive processes were universal and operated independently of culture, so where the sample was drawn from was irrelevant. This assumption has been used to support deficit views of people from other cultures who often performed poorly on tasks devised in Western settings, benchmarked on Western populations and used in an etic fashion. However, we now know these views are insupportable. Culture impacts every facet of being human, including our cognition. Measures of cognition will be inherently biased in favour of the culture they are created within. Psychologists now know that if you wish to conduct cross-cultural studies, local researchers must be involved in the development of resources that are appropriate to the population being studied. When research is conducted by an insider of a culture, it is called adopting an emic approach. When research is conducted by a cultural outsider, it is said to be conducted from an etic perspective.



You can read more about emic approaches on page 73 and etic approaches on pages 74–75.

To what extent is it legitimate for a researcher to draw on their own experiences as evidence in their investigations in the human sciences?

TOK

Cultural competence is the ability to interact effectively and sensitively with individuals from diverse cultures. It involves understanding and respecting cultural differences and adapting communication and practices to be inclusive and culturally sensitive.

Key study

Cole and Scribner (1974)

Aim To examine the strategies used by children from the USA and by Kpelle children (Figure 3.60), who live in rural Liberia, when tasked to remember things.

Method They recruited some local researchers to help develop a more culturally sensitive task (rather than just giving Kpelle children a list of words). These local researchers helped Cole and Scribner (1974) to devise lists of everyday items these children would encounter (Table 3.27).



◀ **Figure 3.60** Kpelle children from rural Liberia.

plate	cutlass
calabash	hoe
pot	knife
pan	file
cup	hammer
potato	trousers
onion	singlet
banana	head tie
orange	shirt
coconut	hat

Table 3.27 The lists of everyday words Cole and Scribner devised with the help of local researchers.

Results The researchers found that Kpelle children who had attended formal schooling could remember about the same number of words as the children from the USA and used the same strategies such as chunking (associating a few items together under a common category). However, the Kpelle children who had not attended any formal schooling continued to underperform compared to the other children. It was not until the local researchers encouraged the use of narrative and storytelling using the objects that these children's recall rates improved to the level of their peers who had attended formal schooling.

Conclusion Memory capacity appears to be similar universally across cultures, but memory strategies seem to vary from culture to culture.

Environmental influences on cognitive processes

One environmental impact on the cognitive process of memory is the presence of stereotypes. Stereotyping is an example of a schema based on a mental representation of a group of people. Stereotypes are simplified, and often negative, generalizations about identifiable groups of people.

Key study

Allport and Postman (1947)

Aim To investigate the effect of racist stereotypes on memories.

Method The researchers invited white and Black Americans to participate in the study. Participants were shown a cartoon drawing of a shabbily dressed white man on the subway. He is holding a shaving razor in an aggressive manner toward a Black man dressed in a suit (Figure 3.62). Using the same serial reproduction technique used by Bartlett in The War of the Ghosts study, the researchers asked participants to describe the cartoon to another participant, who in turn described it to another participant. This was repeated seven times. However, participants were in racially segregated groups. Black participants only retold the story to other Black participants and white participants only retold it to other white participants.



▲ **Figure 3.62** Stimulus cartoon used in Allport and Postman's study.

Results The researchers found that among the white participants, in over half the groups, the races of the characters in the cartoon had swapped, so that it was the Black character who was the aggressor. This error was not made by the Black participants.

Conclusion This study shows that the presence of a social group stereotype and our expectations of how members of this group are expected to act can distort our cognitive process of memory.

Critical thinking

There are issues of *measurement* in this study. As it is over 70 years old, it is fair to question its current validity. It might be argued that stereotyping is less prevalent now, and that progress made in combating racial and other forms of discrimination since the study was published would make it unlikely to be replicable today.

In a more recent study, which investigated gender stereotypes in a similar way, Moss-Racusin et al. (2012) investigated the presence of stereotypes about women in science amongst academic staff at universities in the USA. She designed an independent samples study where two fake resumes for a lab assistant role were produced for 100 professors of chemistry, biology and physics at different universities. The professors, male and female, received one of the two resumes, which were identical except for the first name (John or Jennifer). The professors were asked to rate the competence of the applicants and recommend a salary. The researchers found that not only was John rated as more competent than Jennifer, but that the recommended salary for John was 13 percent higher than for Jennifer. These results were consistent whether the professors were male or female. Rather than demonstrating male professors' bias against female applicants, the results suggest that there is a more general social stereotype about women in science held by men and women. This study goes some way to explain *bias*, prejudice and discrimination against women in the sciences and the gender pay gap. The mundane realism and ecological validity of this study also counters some of the criticisms of Allport and Postman (1947).

TOK

What assumptions underlie the methods used in the human sciences?

Activity 136

If you watch television or movies, identify stereotypes associated with nationality, sexuality, gender or age. Discuss the impact of these.

Potential for improving a cognitive process

Video games have often been criticized as having a negative effect on society. They are blamed for causing increases in everything from aggression to social anxiety and decreases in everything from academic performance to sleep quality. However, research on the subject is decidedly mixed.

One skill that is known to improve with time spent playing video games is visual working memory (VWM), the type of memory needed to perform mental rotation (being able to see an object from various perspectives in your mind) – a key skill in many STEM (Science, Technology, Engineering, Mathematics) fields such as engineering and physics.

The Pew Research Center (2008) reports that nearly all teenage boys in the USA (97 percent) play video games, in contrast to only 63–81 percent of teenage girls (girls' video game use declines as they become older teens). This gender imbalance has impacts on the benefits that can be derived from gaming, as does the different ways that girls game compared to boys. Boys largely play first-person (aka shooter) games, whereas girls play more story-driven or construction-focused games. First-person games have been shown to have the greatest benefit for VWM.



There is a worldwide shortage of research determining cause-and-effect relationships between modern technology and effects on cognitive processes, so claims should be considered cautiously, using critical-thinking skills.

Could playing first-person video games help close the gender gap in STEM fields? Feng et al. (2007) designed a study to examine this question. One skill involved in VWM is mental rotation; this is the ability to see a three-dimensional object in your mind and then rotate it so that you can mentally see it from different perspectives – a key STEM skill (Figure 3.63).

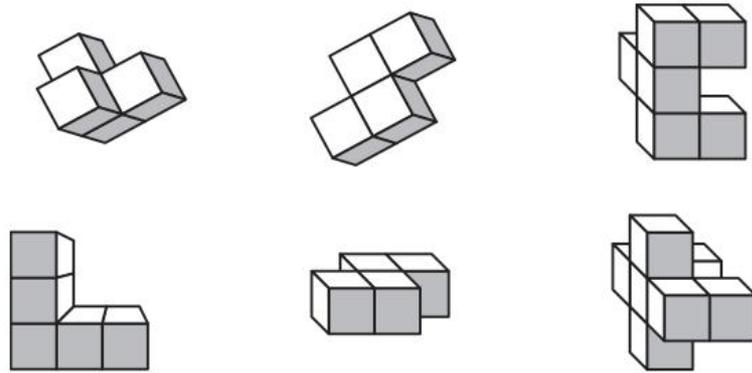


Figure 3.63 Which of the images on the right is the same as the image on the left? You'll need your VWM to figure it out!

Key study

Feng et al. (2007)

Aim To discover if mental rotation could be trained by playing first-person video games and if there would be any gender differences when undergoing this training.

Method The researchers used a matched-pairs design to put 20 participants (10 male and 10 matched females) through 10 hours of video gaming. Participants were given a pre-test on mental rotation to establish a baseline. Half the participants played a first-person video game; the other half played a puzzle-based game. After the 10 hours of video gaming, participants were given a post-test on their mental rotation skills.

Results The researchers found that all participants slightly improved in their mental rotation abilities, but the improvement was only significant in the first-person condition. In addition, the female participants in the first-person game condition improved significantly more than their male counterparts.

Conclusion This study shows that the use of first-person gaming can indeed improve people's mental rotation skills and could be utilized to close the gender gap in STEM professions.

Critical thinking

There are some issues of *measurement* associated with Feng et al. (2007), as well as others studies that use video gaming.

Most studies utilizing video gaming advertise this fact when they are recruiting participants, meaning that participants are likely to be gamers already or have an interest in gaming, leading to a potential *sampling bias*.

Another issue with gaming studies, particularly with those that use first-person games like Feng et al. (2007), is that these games are often violent, and these studies do not address the potential negative implications of engaging with violent content over a prolonged period of time. This raises the issue of the *responsibility* of the researcher to protect participants from harm.

One must also think of the opportunity cost involved in using video games as a way to increase mental rotation skills.

If it takes 10 hours of training to increase mental rotation skills, would those 10 hours be better spent studying STEM skills and content directly or engaging in other activities that can build STEM skills?

Activity 137

Design and conduct a simple survey of 20 classmates to determine whether a correlation exists between hours of smartphone use and one cognitive process such as attention or memory.

Class practical

Research method: Experiment

Quantitative research methods such as laboratory experiments stress the importance of objective data being *measured* and the use of statistical analysis to infer meaning from this data. To do this, psychological constructs (such as love, aggression or depression and – within learning and cognition – memory, language and intelligence) must be fully operationalized, or so well defined that every stakeholder can agree on what is being measured. The goal is to have highly valid and reliable experiments that can be replicated by another research team if desired.

An experiment is defined as a study where the IV is manipulated and a corresponding *change* in the DV is measured. All other variables are held constant (although in practice this is near impossible, with the effect of some confounding and/or extraneous variables to be expected).

Because there is manipulation of the IV, an experiment can establish a cause-and-effect relationship between the IV and the DV, which is why it is the gold standard in scientific, including psychological, research. Inferential statistic tests are then used to examine whether or not the difference between the DV measures is significant or due to chance.

Examples of experiments we have already come across include:

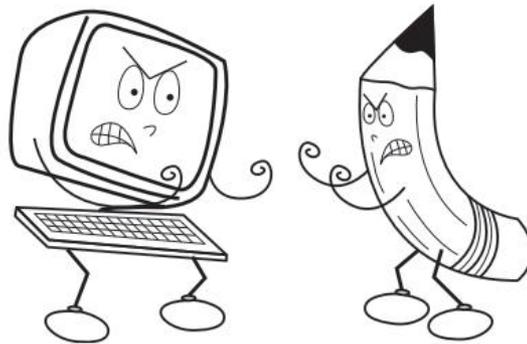
- Loftus and Palmer's car crash experiment
- Nesbitt and Masuda's attention with analytic and holistic thinkers experiment
- Kahneman and Tversky's anchoring bias experiment.

In consultation with your teacher, it is also possible that your class may wish to conduct its own variation of an experiment. However, as there is manipulation involved with experiments, it is important that you, your peers and your teacher act responsibly and keep the IB ethical guidelines in mind; do not attempt any experiments that involve ingestion, harm, conformity, obedience, compliance or

deprivation of any kind. It is also important that consent is gained from participants, including parental consent if participants are under 16. It is permissible in some instances to use partial deception, where full knowledge of the study would affect the outcome, but this is to be done in consultation with your teacher and must not cause harm. Participants still need to be fully debriefed after the experiment, and they retain the right to withdraw their data at this point. The IB stipulates that you must have at least five participants in your experiment class practical.

Topics you may wish to investigate include:

- the difference between visualization and auditory rehearsal for remembering a list of words
- the effect of speed priming on gait pace
- the anchoring bias in guessing your principal's age
- the effect of schema on accurate recall of a story
- the effect of taking notes on computer vs. by hand (Figure 3.64)
- an idea of your own that meets ethical guidelines and is approved by your teacher.



◀ **Figure 3.64** Do you prefer to use a device to take notes, or write by hand?

For the topic you have decided to investigate, make sure you have:

- 1 written one research hypothesis
- 2 written a null hypothesis
- 3 stated the direction (one-tailed/two-tailed or directional/non-directional)
- 4 identified the IV
- 5 identified the DV
- 6 identified any possible confounding and/or extraneous variables
- 7 identified your experimental design
- 8 identified your sampling technique, noting that you need a minimum of five participants
- 9 prepared your resources (including informed consent form and debrief)
- 10 sought permission from your teacher before conducting your experiment.

A **one-tailed (or directional) hypothesis** is a hypothesis that predicts the direction of the relationship between two variables, usually based on the results of previous studies. For example, participants in the pen-and-paper condition will have better recall than participants in the typing condition.

A **two-tailed (or non-directional) hypothesis** is a hypothesis which predicts that there will be a relationship between two variables but where there is uncertainty about what the relationship is (usually if there is contradicting evidence from previous studies). For example, participants in the pen-and-paper condition will have a different level of recall compared to participants in the typing condition.

Class practical: example

Note: For the purpose of the class practical, an experiment is proposed, but you may work with your teacher to make up your own.

Research proposal Investigating the effects of background music on mathematical performance.

Research method This study will use an independent measures experimental design to gather data on the effect of background music on students' performance in a math test. Results will be compared between groups of students who sit a math test with background music playing or in silence. Statistical analysis will be conducted to see if there is any significant difference.

Ethical considerations

- **Sensitive subjects:** Mathematical ability can be a sensitive subject for some students who may not have experienced success in a math classroom. Care should be taken when introducing the topic, and the right to withdraw or not participate must be made clear.
- **Informed consent:** Participants must be made aware of the content of the experiment before taking part. This will allow them to make an informed decision to opt out if it may cause them psychological distress.
- **Deception:** Researchers may justifiably hide the independent variable of the experiment. There is no need to mention the effect of music to participants when conducting the experiment, as this may cause some participants to pay more attention to the music than is needed. Only mentioning that the study investigates mathematical performance is needed.
- **Right to withdraw:** Participants must be informed about their right to withdraw during the study at any time. No justification is required of participants to exercise this right.
- **Responsible use of data:** Researchers must consider how they will use the findings of the study in a responsible way. This may include how the findings may be used to improve conditions in classrooms when testing situations are going on.

Participants Participants taking the same level maths class – for example, all students in maths application and interpretation SL.

Participants selection method The head of math will be approached and asked if the experiment may be conducted during the first 5–10 minutes of two maths classes. Including time for gaining informed consent and a debrief, this is estimated to take 10–15 minutes. A sample of opportunity will be used in that math AI class A will be the control condition (no music) and math AI class B will be the experimental condition (background music).

Null hypothesis There will be no significant difference between participants in the no music condition and participants in the music condition on performance in a math test.

Research hypothesis (directional) Participants in the no music condition will perform better on a math test than participants in the music condition.

IV The presence or absence of background music

DV Performance in a math test

Possible confounding variables Participant variables such as familiarity of some participants with the chosen music or differing levels of math anxiety; conducting each condition at different times of day and/or in different rooms.

Experimental design Independent samples

Sampling technique Sample of opportunity

Resources required Informed consent form, math test, audio file, playback device and speaker, debrief form

Procedure

- 1 Participants will be read a plain language statement with information about the math test part of the study so that they can make an informed decision about whether or not to participate.
- 2 Participants will sign an informed consent form.
- 3 Participants will complete the math test to the best of their ability in the allocated time. It is recommended that no more than 10 minutes be used for this, to minimize disruptions to regular math lessons.
- 4 Math tests will be collected and participants thanked for their time and debriefed.
- 5 Math tests will be scored.

Data analysis method As this experiment gathers quantitative data, statistical analysis is appropriate. A measure of central tendency, the mean and the standard deviation between the two groups should be calculated. It would be interesting to also conduct an inferential statistical test to see if there is a significant difference between the means of the two groups. As this is an independent sample design, and the conditions to conduct parametric tests cannot be assumed to be met, a Mann–Whitney U test is the most appropriate test to conduct. This test will allow the researchers to answer if there is a significant difference in performance in a math test for participants completing it in silence compared to participants completing it with background music

HL extensions

The role of culture in shaping human behavior in the context of learning and cognition

Note: You should be able to discuss and explain how culture can affect learning and cognition in some way. This is one example of how culture can have an effect on learning and cognition. You are not required to learn this material for an examination.

Culture influences our learning and cognition. As outlined in the current chapter, Cole and Scribner's (1974) classic study examining the different strategies children from the USA and Kpelle children used when remembering things helps demonstrate one of the ways in which culture can influence our cognition. As children in the USA are enculturated by schooling to use lists of words to remember things, and work in linear fashions, they were able to memorize the lists of words presented in the study much better than the Kpelle children. On the other hand, Kpelle children's culture of learning by observation and through narrative and storytelling has influenced the strategies they use to remember things – in this case, creating a story in their mind about how they used the objects in their daily lives. In the end, Cole and Scribner (1974) found that the cognitive capacity of the memories of children remained constant over cultures but the strategies used differed.



Conceptual question

Is what you know or have learned bound by your cultural perspectives? How has your culture enhanced your learning?

Activity 138

Discuss with three or four others in your class the process of enculturation when a new student starts in your school. Write down ten “rules” or expectations imposed by the school, some of which are formal and overt (known to all) and some which are covert (known only to the students). How do students learn these rules or behavioral expectations in the school? Can you recall how your behavior changed when you joined a new school/sports team/group?

Key study

Shih, Pittinsky and Ambady (1999)

Aim To investigate if the salience of a stereotype influenced performance in a math test.

Method A purposive sample was used of Asian-American women. The researchers used a repeated measures experimental design, whereby the independent variable was the social identity that was made salient (either being Asian or being female). The dependent variable was the performance in a math test.

Results The researchers found that when participants were reminded of their Asian identities, their performance in a math test was significantly higher than a control group (who did not have any identity made salient), and when their gender identity as women was more salient, their performance on a math test was significantly lower than a control group.

Conclusion Cross-cultural investigation (USA and Canada) indicated that it was the stereotype (Figure 3.65), and not the identity itself, that influenced performance.

Studying the effect of culture on cognition raises the question of whether an emic or an etic approach should be used in research. Cultures can be studied by an insider or by an outsider. When research is conducted by an insider, it is considered emic. In emic studies, the researcher has first-hand experience of the culture, often acquired over a sustained period. The disadvantage is that the researcher may lack the professional distance necessary for objectivity.



Figure 3.65 There are many stereotypes associated with mathematics. What stereotypes relate to psychology?

When research is conducted by an outsider, it is considered *etic*. Ochs (1982) studied the enculturation process of Samoan children's language acquisition using an *etic* approach. The behavior was observed by outsiders; non-Samoan researchers lived within the culture but were of another culture. Howarth's (2002) study of teenagers living in Brixton, UK was also *etic*, because the researcher was an outsider. Research conducted from an *etic* perspective raises issues of *bias* as the researcher will bring to their research preconceived notions of the group being studied. One way to combat this bias is to employ local researchers to work with the research team, thereby adopting a more *emic* perspective.

CONCEPT: Bias

The use of an *emic* approach to research is one tool psychologists use to limit the influence of bias in cross-cultural research. By employing local researchers from within the culture being investigated who are aware of cultural norms, expectations and behaviors, researchers can ensure they capture an authentic view of behavior, rather than misinterpret things based on their own cultural biases.

Malhotra et al. (1996) stated that the *emic* approach examines phenomena from within, investigates just one culture, and adopts relative criteria while the *etic* approach examines phenomena from outside the system, investigates many cultures, and adopts universal criteria. The universalist approach assumes that there are shared psychological processes in all human cultures – the language acquisition process, for instance. In contrast, the relativist approach assumes that cultural groups' psychological processes (for example, the perception of beauty and intelligence) are different and, therefore, that they cannot be compared. Yuki (2003) examined the extent to which SIT is cross-cultural, adopting an *emic* approach when studying Japanese participants and an *etic* approach when studying American participants. When researching groups and cultures, researchers must also be cautious of the ecological fallacy, the assumption that every individual member of a group shares the cultural norms of that group. For example, not every Finnish person enjoys saunas, and not every Australian enjoys Vegemite®. In the same way, not every Kpelle child will prefer to remember items using a narrative technique, and not every American child will prefer a linear word list to building a story in their mind.

The role of motivation in shaping human behavior in the context of learning and cognition

Note: You should be able to discuss and explain how motivation can affect learning and cognition in some way. This is one example of how motivation can have an effect on learning and cognition. You are not required to learn this material for an examination.

Motivation is highly associated with learning. Reflect on your own motivation for learning. Does it come from an innate thirst for knowledge and understanding, or is it driven by the desire to gain the rewards that come with getting a good grade? Or is it a mix of both? Does the answer depend on which IB subject you are thinking about, or differ when you are learning about things you are passionate about – perhaps things that you are exploring in your Extended Essay or one of your CAS activities?

Have you ever considered your teacher's motivations for working with you and helping your learning every day? Bright and Heyting (2024) conducted semi-structured interviews with 20 international school teachers on their motivations to be teachers in international schools. The researchers conducted a reflexive thematic analysis (a type of content analysis) on the interview transcripts and found that, in general, most teachers made their first move into international schools based on the motivation of personal growth and adventure, and the ability to experience new cultures, develop global mindedness and travel. However, when teachers were thinking about moving to a new international school after their first, they were much more motivated by their own professional learning and sought out schools where they could experience more professional development and autonomy. Participants reported a strong motivation to grow as a professional teacher and actively sought out schools who could support their development.

This study investigates the notion of authentic human change. Even though humans are resistant to change, it seems the teachers in Bright and Heyting's (2024) study experienced a dramatic change in the motivational factors driving their behavior. However, this study should also be viewed with the concept of *bias* in mind. Does one of the researcher's names seem familiar? One of the authors of this textbook is one of the researchers in this study. How might they be biased in presenting their results – or indeed in including the study in this textbook? What might be the author's own motivation?

Activity 139

What about your own teachers? Consider interviewing or designing a survey for your teachers about their own motivations to enter (and stay in) the teaching profession. Are they motivated by lifelong learning like those participants in Bright and Heyting's (2024) study?

Key study

Lepper et al. (1973)

Aim To explore the impact of intrinsic and extrinsic motivation on learning among children at Stanford University's (USA) famous Bing nursery, where the children of many of the teaching and research staff attended.

Method The researchers set up a new activity in the nursery area for a three-week period – a table with some paper and markers. The researchers noted which children spent the most time at this table compared to other activity stations where they could play in other ways. They took this time spent at the drawing table as a sign of intrinsic motivation – these children were intrinsically motivated to draw. These intrinsically motivated drawers then became the sample for the study. Over the course of the experiment, these children were taken into a separate room where they were asked to continue their drawing. There were three conditions in the new room.

- 1 **Extrinsic reward:** The child was offered a “good player” certificate with their name on it if they continued to draw.
- 2 **Unexpected reward:** Once the child finished drawing, they were unexpectedly offered a “good player” certificate as a reward.
- 3 **No reward:** Children were not offered and did not expect any reward.

Results The researchers returned to the nursery classroom two weeks later to observe (from behind a one-way mirror) how children chose to spend their time. The children who were in the extrinsic reward condition showed significantly less interest in drawing and spent as little as half the time drawing than they did before receiving the reward.

Conclusion The researchers concluded that providing extrinsic rewards can actually decrease desired behaviours.

Definitions

- **Intrinsic motivations:** Motivations that we are innately wired to act on. For example, we are intrinsically motivated to drink water to survive, but some would also say we are intrinsically motivated to be curious and learn about the world.
- **Extrinsic motivations:** Motivations influenced by an external factor – a reward, for instance. You might be extrinsically motivated to do chores around the house if you get pocket money in return.

Activity 140

Were these children merely responding to something novel in their environment – a new writing activity desk? Can you think of any other possible confounding variables for this experiment? Discuss with a partner.

This study brings into question the role of things like academic or sports awards and token economies in general. By attaching extrinsic rewards such as grades, certificates, medals or trophies to things people like to do, we may actually lessen their motivation to continue to learn these new skills and abilities (Figure 3.66). This insight is not new. As early as 1693, the philosopher John Locke wrote in *Some Thoughts Concerning Education*: “I have always had a fancy, that learning might be made a play and recreation to children; and that they might be brought to desire to be taught, if it were proposed to them as a thing of honour, credit, delight, and recreation”.

CONCEPT: Change

Extrinsic motivators can lead to behavioral *change*. Many fitness enthusiasts will talk about how they originally severely disliked exercise, and relied on extrinsic motivation to get them through their sessions. However, over time, they began to get intrinsic motivation from the exercise and no longer needed the extrinsic motivators. Intrinsic and extrinsic motivators are not always consistent or linear; they can change and vary.



◀ **Figure 3.66** Should we remove extrinsic rewards from school-based settings and let children explore their own interests as agentic learners?

Activity 141

Does your school have academic, sporting, arts or service awards? Do you think the presence (or absence) of these extrinsic motivators has a positive or negative effect on your and your peers' desire to engage in these activities? Can you think of an example in your own life where the addition of a reinforcement has had the opposite of the desired effect and led you to decrease the behavior? Describe this to the class. What would you do if you ran the school?

Lepper et al. (1973) noted that the longer the children spent in school, the more extrinsic motivators proliferated and levels of intrinsic motivation decreased. They suggested adding in five “Cs” to learning and education to make it more intrinsically rewarding.

- **Challenge:** Tackling challenge and tasks just beyond our current state of competence is intrinsically rewarding and leads to learning.
- **Competence:** Humans seek the need to develop and demonstrate competence.
- **Control:** Humans like to feel that they are in control or have agency over their decision-making and their lives, even when at school (although this “C” has been criticized as having a cultural bias).
- **Curiosity:** A sparked sense of wonder and excitement can build intrinsic motivation in all humans. Trying to unravel the complexities of the human condition and the universe is inherently motivating.
- **Context:** This acknowledges the intrinsic motivation of our subversive selves in other contexts. Whether it involves reading a novel, watching a movie, traveling to a new country or playing video games, shifting our perspective can be greatly motivating.

If two competing paradigms give different explanations of a phenomenon, how can we decide which explanation to accept?

TOK

Ryan and Deci's (2017) self-determination theory (SDT) is also applicable when considering the role of motivation in learning. SDT posits that learners are intrinsically motivated to inquire, be curious and explore their worlds, grow as people and learn new things. This frames the role of education systems as tending to this intrinsic curiosity and cultivating it. SDT suggests schools should be in the business of allowing students to follow their interests and passions, with teachers' roles being repositioned from the "sage on the stage" to the "guide by their side". However, it is not only learners' motivation that SDT has something to say about. As all humans are learning all the time, teachers are also learners, and SDT researchers empathize with teachers who may not themselves be experiencing autonomy, competence and/or relatedness in their own lives. For example, unlike in the IB, some curriculum systems do not allow any flexibility in the content that can be taught; teachers may feel micromanaged by overbearing leadership or accountability systems; and the siloed structures of high schools may make teachers feel isolated and alienated from their colleagues.

When SDT is embodied in a school climate, where learners of all ages feel a sense of autonomy, competence and relatedness, intrinsic motivation for learning for all can be developed (Ryan and Deci, 2017, pp. 380–381).

HL practice questions

1. Explain one issue that limits the interpretation of the data in Lepper et al. (1973).
2. Analyze the findings from the Lepper et al. (1973) study and state a conclusion linked to the claim that motivation can shape human behavior in the context of learning and cognition.
3. Choose **one** of the following:
 - i. Discuss how the researchers could improve the credibility of the findings.
 - ii. Discuss how the researchers could avoid bias.
 - iii. To what extent are the findings transferable to other populations or contexts?
4. To what extent can we conclude that motivation may have a positive effect on learning and cognition? Refer to at least two pieces of research discussed in this chapter.

The role of technology in shaping human behavior in the context of learning and cognition

Note: You should be able to discuss and explain how technology can affect learning and cognition in some way. This is one example of how technology can have an effect on human learning and cognition. You are not required to learn this material for an examination.

Much has already been said in this chapter about the role of technology in learning, including the positive benefit on mental rotation for girls in particular shown in Feng et al. (2007). This has implication for the learning of skills related to STEM fields and could be used to help close the gender gap in fields like engineering and physics. Technology is constantly changing and evolving. Discuss what technology you use to enhance your learning and/or cognition. What technology inhibits your learning and/or cognition? How do you find a balance?

Key study

Umejima et al. (2021)

Aim To investigate the role of technology in mitigating cognition processes such as memory.

Method The researchers recruited Japanese university students and had them read two fictional conversations between two people. One conversation was about personal issues; the other was about an academic issue. These conversations included details of many scheduled meetings and appointments that the participants were asked to record. The IV was the way they were asked to record the scheduled appointments. One group was asked to record them in a diary, one group on a smartphone and another group on a tablet. An hour after they had finished recording the appointments, they were given an fMRI scan while being asked to recall the appointments they had recorded.

Results The results showed that the diary group's memory for the appointments was better than the two digital groups. The fMRI of the diary group also showed greater activation in their hippocampi and prefrontal cortices.

Conclusion When we use technology to make our memory tasks easier for us, we reduce our memory performance. This finding only becomes more important in a world that is saturated with digital and smart devices.

A similar study to Umejima et al. (2021) is the classic study by Mueller and Oppenheimer (2014), who famously found in a quasi-experiment that when Princeton University (USA) students were asked to take notes during a lecture they were attending, those who took notes by hand had a better conceptual understanding of the lecture's content than those who took notes by typing into a computer. These results suggest that even the most basic of technological change, such as moving from a pen to a keyboard, may affect our ability to cognitively process and learn new things.

One way to interpret this finding is that when we type, we can often keep up with the pace of conversation (if we have successfully learned to touch type!); we might type down word-for-word what the lecturer is saying. In other words, we only shallowly process the content enough to write it down. When we write with a pen, we are much slower, so we must first deeply process what the speaker has said and make decisions about which are the vital bits of information to write down and which are not. By making things easier for ourselves – by typing instead of writing – we have removed a desirable difficulty in the learning process. Another way to interpret this finding is that perhaps the laptop users spent just as much time on TikTok™, Instagram® or a videogame as they did on their notes page during the lecture!

However, one must also question what the purpose of note taking is. If it is to directly encode information into the brain, then it does seem that taking notes by hand is indeed superior. However, if the purpose is to create a record that can be drawn on later to study, then perhaps taking notes by computer is more advantageous, as it allows for more details to be captured.



CONCEPT: Perspective

When considering the role of technology in learning and cognition, it is important to consider differing generational *perspectives*. “Boomers” (those born between 1945 and 1965) may be quick to point out how digital technologies are going to be the downfall of youth. However, this same generation may remember the uproar when television first gained popularity and how older generations spoke of how it would “rot their brains”. This difference of generational perspectives on the role of technology in learning and cognition is not new. In ancient Greece, Socrates famously offered a scathing critique of the technology of writing, saying it would ruin people’s memory and their ability to think critically and deeply about issues and ideas. What perspective will “Gen Alpha” (those born in the 21st century) have on the role of technology on their cognition? What will be the new technology responsible for the downfall of youth in their time?

Technology is constantly changing. Almost as soon as researchers investigate, research, publish and review the interaction between technology and learning and cognition, the research risks becoming obsolete as new technologies emerge. This phenomenon is only set to increase in pace with the influence of generative AI and its influence on learning and cognition. Also, research investigating the relationship between technology and learning and cognition does not generate longitudinal data for a long time, as we are unable to see the long-term effects of technology until it has been used by people for a long period.

HL practice questions

1. Explain one issue that limits the interpretation of the data in Umejima et al. (2021).
2. Analyze the findings from the Umejima et al. (2021) study and state a conclusion linked to the claim that technology can shape human behavior in the context of learning and cognition.
3. Choose **one** of the following:
 - i. Discuss how the researchers could improve the credibility of the findings.
 - ii. Discuss how the researchers could avoid bias.
 - iii. To what extent are the findings transferable to other populations or contexts?
4. To what extent can we conclude that technology may have a positive effect on learning and cognition? Refer to at least two pieces of research discussed in this chapter.

[End of HL extension section]

Context: Learning and cognition

Concept – Context practice questions

Bias

- 1 How might cognitive biases, such as anchoring or confirmation bias, affect a student’s ability to learn or form accurate schemas?
- 2 In what ways could researcher and participant biases influence the results of studies on operant conditioning and its effectiveness in behavior modification?
- 3 How can the dual process model of thinking (intuitive vs. rational) explain why some learners rely on cognitive shortcuts, like heuristics, when making decisions in educational settings?

- 4 Describe how SLT might be subject to gender or cultural bias when interpreting the role of models in shaping behavior. How could such biases be mitigated in research and application?
- 5 How could biases present in memory processes, such as schema distortion or stereotype activation, affect a student's learning experience in a multicultural classroom?

Causality

- 1 How can the concept of bidirectional ambiguity challenge the establishment of cause-and-effect relationships in SLT experiments?
- 2 In what ways might internal validity be compromised in research studies examining operant conditioning in real-world environments?
- 3 How does the dual process model of thinking and decision-making interact with cognitive biases, such as anchoring bias, in shaping our understanding of cause-and-effect in human learning?
- 4 Can the principles of classical and operant conditioning offer a reductionist view of human behavior, and how does this perspective limit our understanding of the complex interactions between cognition, motivation and environment?
- 5 How does schema theory explain the process by which we attribute causality to events based on prior knowledge, and how might this cognitive shortcut lead to errors in judgment during decision-making?

Change

- 1 How do cognitive biases, such as anchoring bias, create barriers to planned behavior change, especially in educational or health promotion strategies?
- 2 In what ways can classical and operant conditioning be employed to promote long-term behavior change, and how might resistance to change affect the efficacy of these strategies?
- 3 How does the dual process model of thinking and decision-making interact with intrinsic motivation in promoting deliberate behavior change, such as adopting healthier lifestyle habits?
- 4 How can SLT be applied to overcome resistance to behavior change in group settings, such as in educational or organizational interventions?
- 5 What role do schema and memory processes play in the persistence of unhealthy behaviors, and how might these cognitive structures need to be altered for effective long-term change?

Measurement

- 1 How can psychologists use different methods of data collection (for example, self-reports, brain imaging or behavioral observations) to assess the influence of cognitive biases, such as anchoring bias, on decision-making? What challenges might arise in measuring these cognitive processes?
- 2 In what ways might the operationalization of variables in classical and operant conditioning studies impact the reliability and validity of the findings? How do researchers ensure that their measurements accurately reflect learned behaviors, such as in Skinner's puzzle box experiments?
- 3 How can schema theory help explain the limitations of anecdotal and self-reported data in psychological research? What methods could be used to triangulate these types of data with more empirical evidence when studying memory and learning processes?

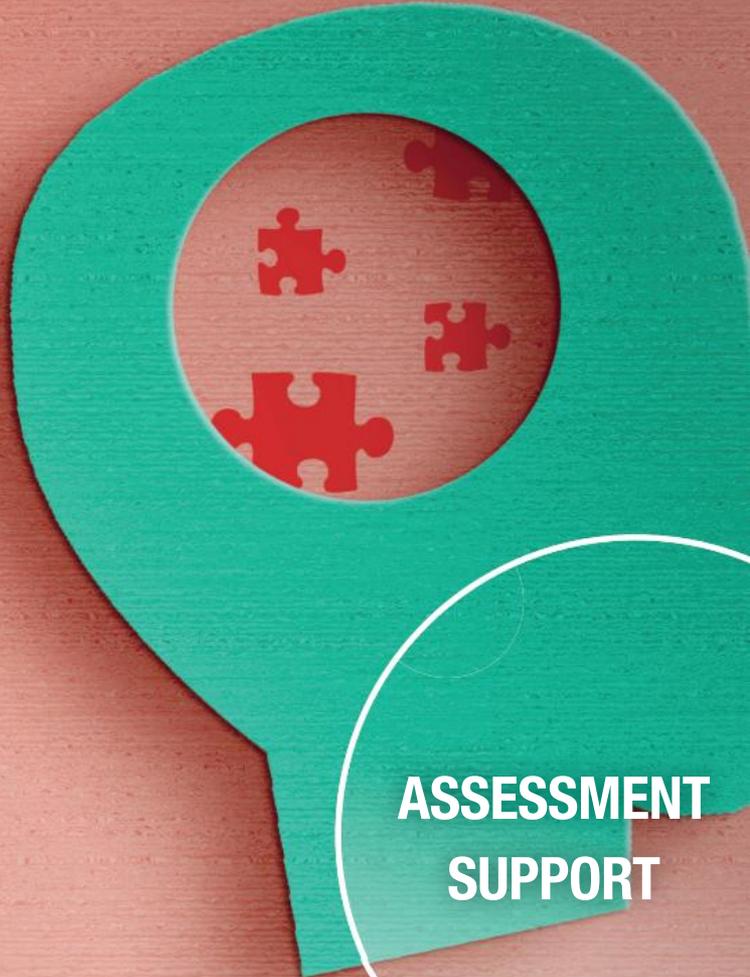
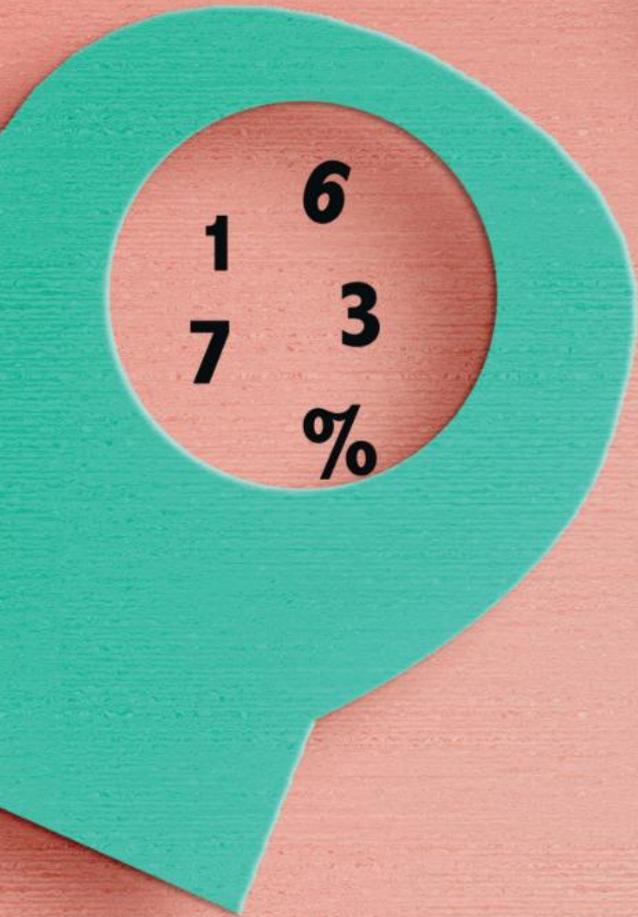
- 4 When studying the effects of SLT on behavior, how might the type of data collected (quantitative vs. qualitative) influence the conclusions drawn? Can you think of a study where brain imaging or behavioral measures might offer more reliable insights than self-reports or anecdotal evidence?
- 5 Discuss how dual process models of decision-making (for example, system 1 vs. system 2) could be measured using direct and indirect methods. What might be some limitations of these measurement techniques, and how might psychologists address these limitations to improve the credibility of their findings?

Perspective

- 1 How do the biological, cognitive and sociocultural perspectives help explain the processes involved in classical and operant conditioning, and how do these approaches provide a more holistic view of human learning compared to focusing on one perspective alone?
- 2 In what ways can the dual system model of thinking (system 1 and system 2) be applied to understand how biases such as anchoring bias may vary across different cultures and how they influence decision-making in different social contexts?
- 3 How does schema theory, which explains how we organize and recall information, intersect with the sociocultural perspective in explaining how cultural factors shape the way individuals process and store new information? Can this understanding be used to improve teaching and learning methods?
- 4 Using SLT, explain how children's behavior is shaped by observing others in their environment. How might this behavior be differently understood through the lens of cognitive and sociocultural approaches in psychology?
- 5 How does the study of memory, particularly through cognitive models such as the MSM and the WMM, benefit from incorporating biological and sociocultural perspectives, especially when considering how different environmental factors such as education and culture influence cognitive processes?

Responsibility

- 1 How might the use of informed consent in psychological research affect the learning process of participants, particularly in studies utilizing cognitive tasks such as memory recall or problem-solving activities?
- 2 Ethical standards require researchers to reduce harm when using animal participants. How can the principles of operant conditioning be ethically applied in animal research while minimizing harm and ensuring responsible research practices?
- 3 Cognitive biases such as anchoring bias can influence decision-making in psychological research. How might a psychologist ensure their responsibility to protect vulnerable participants from cognitive biases during socially sensitive studies, such as those on stereotyping or prejudice?
- 4 SLT suggests that individuals learn behaviors they observe in others. In psychological experiments on aggression or prosocial behavior, how can researchers ethically balance the responsibility to prevent harm while allowing for natural social learning to occur in the experimental setting?
- 5 Schema theory explains how individuals organize and recall information based on prior knowledge. In research involving socially sensitive issues (stigmatized groups, for instance), how can psychologists ensure they act responsibly in designing studies that avoid reinforcing harmful schemas or stereotypes through the findings they publish?



**ASSESSMENT
SUPPORT**



Command terms for psychology

Students should be familiar with the following key terms and phrases used in examination questions, which are to be understood as described below. Although these terms will be used frequently in examination questions, other terms may be used to direct students to present an argument in a specific way.

These command terms indicate the depth of treatment required.

Assessment objective 1 – knowledge and understanding

Command term	Definition
Describe	Give a detailed account.
State	Give a specific name, value or other brief answer without explanation or calculation.

Assessment objective 2 – application and analysis

Command term	Definition
Analyse	Break down in order to bring out the essential elements or structure.
Apply	Use an idea, equation, principle, theory or law in relation to a given problem or issue.
Comment	Give a judgement based on a given statement or result of a calculation.
Design	Produce a plan, simulation or model.
Explain	Give a detailed account including reasons or causes.
Interpret	Use knowledge and understanding to recognize trends and draw conclusions from given information.
Predict	Give an expected result.
Suggest	Propose a solution, hypothesis or other possible answer.

Assessment objective 3 – synthesis and evaluation

Command term	Definition
Compare and contrast	Give an account of similarities and differences between two (or more) items or situations, referring to both (all) of them throughout.
Discuss	Offer a considered and balanced review that includes a range of arguments, factors or hypotheses. Opinions or conclusions should be presented clearly and supported by appropriate evidence.
Evaluate	Make an appraisal by weighing up the strengths and limitations.
Examine	Consider an argument or concept in a way that uncovers the assumptions and interrelationships of the issue.
To what extent?	Consider the merits or otherwise of an argument or concept. Opinions and conclusions should be presented clearly and supported with appropriate evidence and sound argument.

From Subject Guide page 98.

Paper 1

Aim: Integration of the concepts, content and contexts.

Marks: 35

Time: 1 hour 30 minutes

Weighting: SL 35%, HL 25%

Concepts: There are six key concepts in the study of DP Psychology: bias, causality, change, measurement, perspective and responsibility.

Content: Biological, cognitive and sociocultural approaches, as well as the research methodology used to understand human behavior.

Contexts: Health and well-being, Human development, Human relationships, Learning and cognition.

Paper 1 overview

Section A: Two compulsory short-answer questions from two of the three content areas.

Section B: Two compulsory short-answer questions asking students to apply their knowledge of content to an unseen situation, each from one of four contexts.

Section C: Students answer one of two concept-based extended response questions, each from a different context.

Section A

Command terms associated with this Assessment Objective are: AO1 Knowledge and understanding and AO2 Application and analysis.

Section A will comprise two compulsory short-answer questions (marked out of 4) designed to assess your knowledge of theories and content from two of the three content areas (biological, cognitive, sociocultural). These questions may ask you to explain or describe a psychological idea or a theory and provide an example. Examples may be relevant to the research study or the situation.

Psychological terminology listed in the Content section will be used in formulating the questions. As the content may be taught in any of the contexts, a context will not be specified in the question.

The focus of assessment will be on your understanding of the psychological content or theory as evidenced by your explanation and the relevance of your example. Knowledge of details of research studies will not be assessed.

Example questions

Biological approach to human behavior

Describe how **one** chemical messenger plays a role in **one** human behavior. (4 marks)

Sociocultural approach to human behavior

Explain how social identity theory may be applied to explain **one** human behavior. (4 marks)

Cognitive approach to human behavior

Explain anchoring bias or confirmation bias with reference to **one** example of human behavior. (4 marks)

Responses will be assessed using these descriptors.

Mark	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–2	<ul style="list-style-type: none"> The response demonstrates limited knowledge relevant to the question. The example is relevant but is not explained.
3–4	<ul style="list-style-type: none"> The response demonstrates detailed knowledge relevant to the question. The example is relevant and explained.



Table 4.1 Paper 1, Section A level descriptors from Study Guide, pages 45.

Activity 142

- Identify an area you are confident with.
 - Reflect on the biological, cognitive or sociocultural approaches to human behavior. Choose one approach where you feel most confident in your understanding.
 - Provide a brief explanation of the theory, followed by an example that illustrates it clearly.
- Identify an area for improvement.
 - Identify an area in the biological, cognitive or sociocultural approaches where you feel less confident. Write down what you struggle with and explain why you find it challenging.

Section B

Command terms associated with this Assessment Objective are: AO2 Application and analysis.

Section B will comprise two compulsory short-answer questions (marked out of 6) that are designed to assess your ability to apply knowledge to new situations or in new scenarios. You will be required to apply your understanding of content to a context-specific situation or scenario.

Psychological terminology listed in the Content section will be used in formulating the questions. Each question will be based on one of the four contexts. The situation or scenario will be provided as part of the question.

The focus of assessment will be for you to apply your knowledge of content to an unseen situation.

Example questions

1. A group of researchers is investigating imagination as a cognitive process. They suggest a model in which imagination consists of three stages of processing:
 - selection of elements
 - random combination of elements with each other
 - evaluation of combinations and output.

To test this model, they conduct a study with a sample of elementary school children. Each child is given a set of toy body parts (for example, tails, feet, hair, wings) and is asked to create an imaginary creature. Researchers observe that children first select a subset of body parts, then spend time combining them with each other, then decide on a final version and present it to the researchers.

With reference to this study, explain the role of models in the study of cognitive processes. (6 marks)

2. As the school psychologist, you have been asked to suggest a strategy to promote empathy and/or prosocial behavior among children at your school.

Explain how social learning theory could be used to achieve this goal. (6 marks)

Responses will be assessed using these descriptors.

Mark	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–2	<ul style="list-style-type: none"> • Knowledge and understanding of the question is limited. • The application of knowledge is relevant but limited.
3–4	<ul style="list-style-type: none"> • Knowledge and understanding has some detail and is mostly accurate. • The application of knowledge is relevant and partially developed.
5–6	<ul style="list-style-type: none"> • Knowledge and understanding is accurate and detailed. • The application of relevant knowledge is well developed.



Table 4.2 Paper 1, Section B level descriptors from Study Guide, pages 45–46.

Activity 143

- 1 Identify an area you are confident with.
 - Reflect on a specific context (for example, Health and well-being or Learning and cognition) where you feel confident in applying psychological ideas from the content areas. Select a situation where you believe you can effectively apply your knowledge of psychological content (biological, cognitive or sociocultural approaches).
 - Describe the situation in your own words, focusing on how psychological theories or models could be applied.
 - Provide an example of how you would apply a relevant psychological theory (social learning theory, cognitive development models, etc.) to address the scenario.
- 2 Identify an area for improvement.
 - Reflect on a different context (for example, Human development or Human relationships) where you feel less confident. Choose areas from the content or where applying psychological ideas feels challenging.
 - Write down the scenario and explain what makes it difficult to apply your knowledge. Specify which aspects of the content (a theory or model, for instance) you find hard to relate to the unseen situation.
 - Identify what you would need to improve or clarify to be more confident in your ability to apply psychological theories.

Section C

Command terms associated with this Assessment Objective are: AO1 Knowledge and understanding and AO3 Synthesis and evaluation.

Section C will comprise two concept-based extended response questions, each from a different context (marked out of 15). You will be required to answer one of the two questions.

The focus of assessment is on conceptual understanding and the ability to think critically about psychology. Knowledge of specific details of research studies is not assessed.

Example questions

1. In the context of human development, evaluate one or more strategies used by developmental psychologists to measure theory of mind. (15 marks)
2. One claim in health and wellness psychology is that one perspective is not enough to explain mental health. Discuss this claim with reference to one biological explanation of one or more disorders. (15 marks)

Responses will be assessed using these descriptors.

Mark	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–3	<ul style="list-style-type: none"> The response indicates little understanding of the demands of the question. Knowledge and understanding of specific content/concept(s) is very limited and contains inaccuracies. The response is descriptive. Any analysis present is superficial or incoherent. Links between concepts are not stated, or they are not relevant. Where a conclusion is included, this is very superficial or is not consistent with the rest of the response. Psychological terminology is not used or is consistently used inappropriately. Points are frequently inaccurate and unclear.
4–6	<ul style="list-style-type: none"> The response indicates some understanding of the demands of the question. Relevant knowledge and understanding of content/concept(s) is described. There is limited analysis present and overall the response is more descriptive than it is analytical. Links between concepts are stated, and they are partly relevant. A simplistic conclusion is included. Psychological terminology is used, but often inappropriately. Points are frequently imprecise or vague.
7–9	<ul style="list-style-type: none"> The response indicates understanding of the demands of the question, but these demands are only partially addressed. Relevant knowledge and understanding of content/concept(s) is partly explained. The response contains analysis, although this analysis lacks development. Links between concepts are explained, and they are partly relevant. A conclusion is included but it is not always consistent with the arguments presented. Psychological terminology is used sometimes appropriately. Relevant points are made but lack accuracy and development.
10–12	<ul style="list-style-type: none"> The demands of the question are addressed. Relevant knowledge and understanding of content/concept(s) is mostly explained. The response contains critical analysis, although this analysis lacks development. Links between concepts are included and explained. The response argues to a conclusion that is consistent with the arguments presented. Psychological terminology is used, mostly appropriately. Points made are relevant and accurate but lack detail.
13–15	<ul style="list-style-type: none"> The demands of the question are addressed. Relevant knowledge and understanding of content/concept(s) is fully explained. The response contains well-developed critical analysis. Links between concepts are included throughout the response and fully explained. The response argues to a reasoned and clearly stated conclusion that is consistent with the arguments presented. There is accurate and precise use of psychological terminology. Points are relevant, accurate and detailed.

Table 4.3 Paper 1, Section C level descriptors from Study Guide, pages 46–47.

Activity 144

- 1 Identify an area you are confident with.
 - Choose one of the six key concepts (bias, causality, change, measurement, perspective, responsibility) where you feel confident in your understanding. Reflect on how this concept has appeared in your studies and how you have successfully applied it in extended responses or discussions.
 - Write a brief explanation of the concept in your own words, focusing on why you feel confident in your understanding.
 - Provide an example from each of the contexts that demonstrates your ability to critically analyze or apply this concept in a meaningful way.
- 2 Identify an area for improvement.
 - Reflect on one of the six key concepts where you feel less confident or have found it challenging to apply in critical thinking tasks.
 - Write down the concept and explain what aspects you find difficult to understand or apply in extended response questions.
 - Describe a context where you struggled to use this concept and explain what you need to improve on to feel more confident.

Paper 2

Aim: Applying concepts and content to research contexts.

Marks: 35

Time: 1 hour 30 minutes

Weighting: SL 35%, HL 25%

Paper 2 overview

Section A: Four compulsory questions that focus on the class practicals.

Section B: Evaluation of an unseen research study with regard to two or more concepts.

Section A

Command terms associated with this Assessment Objective are: AO1 Knowledge and understanding, AO2 Application and analysis and AO3 Synthesis and evaluation.

Section A will comprise four compulsory questions that focus on the class practicals. The focus of the assessment will be on the research method itself rather than the context in which the practical was conducted.

1. Question 1a: Knowledge and understanding (4 marks)

This question will ask you about your knowledge and understanding of the research method you used in the class practical.

Example question

Describe how you used an interview or focus group in your class practical, including the aim and procedure.

Activity 145

Reflect on each of your class practicals in terms of the methods you used. Write a short reflection on the specific practical, including the research method used, its aim and how the method was applied in practice. Make sure you are familiar with each of the methods and how you used them to generate understanding.

2. Question 1b: Application (4 marks)

This question will ask you to link your knowledge of the concepts to your class practical.

Example question

Explain the concept of bias in relation to your interview or focus group class practical.

Activity 146

Reflect on each of your class practicals in terms of the concepts (bias, causality, change, measurement, perspective, responsibility). Write a short reflection on each practical, focusing on how each of the concepts can be made relevant to the design, methodology or analysis of your study. For each concept, describe how it impacted your research process or findings, and reflect on how it may help or hinder understanding of the psychological area you investigated. Make sure you are familiar with each of the concepts and how they were applied in your practicals.

3. Question 1c: Compare and contrast (6 marks)

This question will ask you to compare and contrast (similarities and differences) the method used in your class practical with another potential method.

Example question

Compare and contrast the use of an interview or focus group used in your class practical with an experiment.

Activity 147

Think about one of your class practicals, focusing on the method you used. Briefly describe the method, its purpose and how you used it. Choose a different method (an experiment, for instance) and compare it with the one you used. Write down two similarities and two differences between the methods. Reflect on which method you think is better for your topic and explain why in 2–3 sentences.

4. Question 1d: Design (6 marks)

This question will ask you to design a further study to investigate the same topic you addressed in your class practical.

Example question

Design an observation to investigate the same topic as you investigated in your class practical.

Activity 148

Think about one of your class practicals, focusing on the topic you investigated. Briefly describe the topic and the method you used. Now, choose a different method (an observation, for instance) to investigate the same topic. Write down how you would use the new method. Reflect on why the new method would help answer the same question. Now do the same using another method. Keep track of your notes and ensure you can explain how to apply different methods to the same topics.

Responses will be assessed using these descriptors.

Question 1a: Knowledge and understanding (4 marks)

Mark	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–2	<ul style="list-style-type: none"> The response demonstrates limited knowledge and understanding of the research methodology relevant to the class practical. Psychological terminology is limited or contains some inaccuracies.
3–4	<ul style="list-style-type: none"> The response demonstrates detailed knowledge and understanding of the research methodology relevant to the class practical. Psychological terminology is used accurately.



Table 4.4 Paper 2, Section A, Question 1a level descriptors from Study Guide, page 47.

Question 1b: Application (4 marks)

Mark	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–2	<ul style="list-style-type: none"> The knowledge and understanding of the concept is relevant but limited. There are some relevant links between the concept and the class practical.
3–4	<ul style="list-style-type: none"> The knowledge and understanding of the concept is well developed. There are clear and detailed links between the concept and the class practical.



Table 4.5 Paper 2, Section A, Question 1b level descriptors from Study Guide, page 47.

Question 1c: Compare and contrast (6 marks)

Mark	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–2	<ul style="list-style-type: none"> Similarities or differences are described in limited detail or contain errors. There is limited psychological terminology relevant to the research methods.
3–4	<ul style="list-style-type: none"> Similarities and differences are explained in limited detail and may lack clarity or either similarities or differences are discussed in detail. Psychological terminology relevant to the research methods is used, but with some inaccuracies.
5–6	<ul style="list-style-type: none"> Similarities and differences are discussed in detail.



Table 4.6 Paper 2, Section A, Question 1c level descriptors from Study Guide, pages 47–48.

Question 1d: Design (6 marks)

Mark	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–2	<ul style="list-style-type: none"> The procedure of the research method is described in limited detail or contains inaccuracies. There is limited use of psychological terminology relevant to the research method.
3–4	<ul style="list-style-type: none"> The procedure of the research method is explained in some detail but lacks clarity. Psychological terminology relevant to the research method is used, but with some inaccuracies.
5–6	<ul style="list-style-type: none"> The procedure of the research method is explained with accuracy and detail. Psychological terminology relevant to the research method is used effectively.



Table 4.7 Paper 2, Section A, Question 1d level descriptors from Study Guide, page 48.

Section B

Command terms associated with this Assessment Objective are: AO1 Knowledge and understanding and AO3 Synthesis and evaluation.

Section B will comprise a question requiring you to discuss a research study with regard to two or more concepts (marked out of 15). The focus of assessment will be the evaluation of an unseen research study with regard to two or more concepts. The study will be provided in the stimulus material. The study may be experimental or non-experimental. The study will align to one of the four contexts (Health and well-being, Human development, Human relationships, Learning and cognition). The question will specify four or more of the concepts (bias, causality, change, measurement, perspective, responsibility).

Example question

Discuss the following study with reference to **two or more** of the following concepts: bias, causality, measurement and/or responsibility. (15 marks)

To test whether self-esteem affects attraction, Kiesler and Baral conducted an experiment. They administered a fake IQ test to a group of men and gave them fictitious scores. One group was told that they had scored “off the charts” – the highest scores ever seen on the exam. The second group was told that there must have been some misunderstanding because their scores were so low that the errors cannot be accounted for. Participants were asked to redo the test two weeks later. After completing the test, the individuals were told they would receive the test scores individually instead of in a group.

Once the scores were given to participants, they were asked to wait in another room to receive their payment for participating in the study. During that time, an attractive woman (a confederate) walked into the room and sat one seat away from the participant. The researchers wanted to see if the participant's self-esteem affected their willingness to engage in discussion with an attractive woman. They found that the men who received higher scores engaged in conversation with the women more quickly and in more detail than the men who received low test scores.

Responses will be assessed using these descriptors.

Mark	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–3	<ul style="list-style-type: none"> • The response indicates little understanding of, and critical engagement with, any of the specified concepts in relation to the study. • The response is descriptive. Any analysis present is superficial or incoherent. Links between concepts and source material are not included or are irrelevant to the discussion. Where a conclusion is included, this is very superficial or is not consistent with the rest of the response. • Psychological terminology is not used or is consistently used inappropriately. Points are frequently inaccurate and unclear. There are few, if any, references to the study.
4–6	<ul style="list-style-type: none"> • The response indicates a basic understanding of, and critical engagement with, at least one of the specified concepts in relation to the study. • There is limited analysis present and overall the response is more descriptive than it is analytical. Links between concepts and the study are of limited relevance or ineffectively support the discussion. A simplistic conclusion is included. • Psychological terminology is used, but often inappropriately. Points are frequently imprecise or vague. There are occasional references to the study.
7–9	<ul style="list-style-type: none"> • The response indicates some understanding of, and critical engagement with, one or more of the specified concepts in relation to the study. • The response contains analysis, although this analysis lacks development. Links between concepts and the source material are relevant, but they lack development in support of the discussion. A conclusion is included. • Psychological terminology is used, sometimes appropriately. Relevant points are made but lack accuracy and development. Specific references to the study are made, although these are sometimes ineffective.

10–12	<ul style="list-style-type: none"> • The response indicates good understanding of, and critical engagement with, at least two of the specified concepts in relation to the study. • The response contains critical analysis, although this analysis lacks development. Links between concepts and the study are used to support the discussion. The response argues to a conclusion that is consistent with the arguments presented. • Psychological terminology is used, mostly appropriately. Points made are relevant and accurate but lack detail. There are specific references to the study.
13–15	<ul style="list-style-type: none"> • The response indicates very good understanding of, and critical engagement with, two or more of the specified concepts in relation to the study. • The response contains well-developed critical analysis. Links between concepts and source material are relevant and well developed and effectively support the discussion. The response argues to a reasoned and clearly stated conclusion that is consistent with the arguments presented. • There is accurate and precise use of psychological terminology. Points are relevant, accurate and detailed. There are specific and effective references to the study.

Table 4.8 Paper 2, Section B level descriptors from Study Guide, pages 48–49.

Activity 149

Find other research scenarios in your work or online. Make note of the key elements (aim, method, findings, etc.) and any nuances that might be interesting. Choose two concepts (for example, bias and measurement) that relate to the study and write an explanation of how each concept applies to the study. Consider how they might affect the study's design, results or conclusions. Reflect on the strengths and weaknesses of the study based on the concepts you chose. Write a short paragraph about how these concepts can be applied to the study.

Paper 3 (HL)

Aim: Data analysis and interpretation of research data.

Marks: 30

Time: 1 hour 45 minutes

Weighting: HL only: 30%

Command terms associated with this Assessment Objective are: AO2 Application and analysis and AO3 Synthesis and evaluation.

Your HL extensions will be assessed in Paper 3. There will be four source-based questions with quantitative and qualitative findings. The focus of the questions will be from one of the HL extensions. For example, the sources could focus on the role of motivation in learning (Learning and cognition), the potential effects of technology on mental health (Health and well-being) or the role of culture in group dynamics (Human relationships).

You will be required to answer four questions based on the sources. Some questions will be solely focused on analyzing data and interpreting the results of the provided studies, whereas other questions will require you to make conclusions and generalizations based on both the sources and your general understanding of the HL extension. This means that knowledge of the extension will be assessed in its application to unseen material.

To be prepared for this paper, you should have an in-depth understanding of principles of data analysis and interpretation, as well as knowledge and appreciation of the challenges surrounding psychological research.

The sources will reflect one of the following HL extension inquiry topics within one of the four contexts:

- the role of culture in shaping behavior
- the role of motivation in shaping behavior
- the role of technology in shaping behavior.

Activity 150

For each of the HL extension inquiry topics, write a short explanation of how the chosen topic impacts behavior. Include 3–4 challenges that researchers might face when studying this area (bias, data interpretation, etc.).

Activity 151

Think about how data from both quantitative and qualitative research could be used to study this topic.

For each, write a short paragraph on how data might support or challenge findings in this area.

- The research data will be provided in the sources. The data and findings may be authentic or created specifically for the exam. The sources will be from both quantitative research and qualitative research and may be experimental or non-experimental.

The focus of assessment for the four questions will be on the interpretation of graphs, data analysis, research considerations and synthesis of data sources.

1. Question 1: Interpretation of graphs (3 marks)

This question requires you to explain **one** issue that limits the interpretation of the information from a given source.

Example question

Explain one issue that limits the interpretation of the data in Source 1.

2. Question 2: Data analysis (6 marks)

This question requires you to analyze the findings from **one** of several given sources and state a conclusion.

Example question

Refer to Source 2 in the accompanying resource booklet. Analyze the findings from the source and state a conclusion linked to the claim that the use of technology in education may have a negative effect on the mental health of students.

3. Question 3: Research considerations (6 marks)

This question requires you to consider qualitative research considerations of credibility, bias or transferability. The examination paper will comprise **one** of the following questions in reference to one of the sources.

- Discuss how the researcher could improve the credibility of the findings.
- Discuss how the researcher could avoid bias.
- To what extent are the findings transferable to other populations or contexts?

Example question

Refer to Source 3 in the accompanying resource booklet. Discuss how the researcher could improve the credibility of the findings in Source 3.

4. Question 4: Synthesis (15 marks)

This question requires you to interpret at least three of the given sources from the resource booklet and use your own knowledge to discuss the validity of the claim illustrated by these sources. The claim will be stated as part of the question.

Example question

Use at least three of the sources in the resource booklet (Sources 2 to 5), and your own knowledge, to answer the following question.

To what extent can we conclude that the use of technology in education may have a negative effect on the mental health of students?

Responses will be assessed using these descriptors.

Question 1: Interpretation of graphs (3 marks)

Mark	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1	A relevant issue is identified.
2	A relevant issue is clearly described.
3	A relevant issue is explained.



Table 4.9 Paper 3, Question 1 level descriptors from Study Guide, page 50.

Question 2: Data analysis (6 marks)

Mark	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–2	<ul style="list-style-type: none"> • There is limited analysis of the data or the analysis contains inaccuracies. • A conclusion is attempted but it is not relevant.
3–4	<ul style="list-style-type: none"> • Analysis of the data is accurate but lacks detail or development. • A conclusion is stated but the link to the findings lacks clarity.
5–6	<ul style="list-style-type: none"> • The data is analyzed in detail. • A conclusion is stated that is explicitly linked to the findings.



Table 4.10 Paper 3, Question 2 level descriptors from Study Guide, page 50.

Question 3: Research considerations (6 marks)

Mark	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–2	<ul style="list-style-type: none"> • Discussion shows limited understanding of the research consideration. • Reference to relevant supporting evidence from the source is limited or missing.
3–4	<ul style="list-style-type: none"> • Discussion shows some understanding of the research consideration, but with some inaccuracies. • Reference to relevant supporting evidence from the source is implicit.
5–6	<ul style="list-style-type: none"> • Discussion shows detailed understanding of the research consideration. • Reference to the relevant supporting evidence from the source is explicit.



Table 4.11 Paper 3, Question 3 level descriptors from Study Guide, page 50.

Question 4: Synthesis (15 marks)

Mark	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–3	<ul style="list-style-type: none"> • The response indicates little understanding of the demands of the question. Knowledge and understanding relevant to the claim is anecdotal or of very marginal relevance. • The response is mostly descriptive. Any analysis present is superficial or incoherent. Knowledge relevant to one or more of the sources is included but there is no clear link to the claim. • There is little or no discussion of different points of view. Where a conclusion is included, it is superficial or is not consistent with the rest of the response.
4–6	<ul style="list-style-type: none"> • The response indicates some understanding of the demands of the question. Knowledge and understanding relevant to the claim is limited or of marginal relevance. There is limited discussion of the extent to which the claim is valid. • The response contains limited analysis and overall is more descriptive than analytical. Relevant knowledge is used to interpret one or more of the sources but with inaccuracies or without a clear link to the claim. • There is little relevant discussion of different points of view. A simplistic conclusion is included.
7–9	<ul style="list-style-type: none"> • The response indicates understanding of the demands of the question, but these demands are only partially addressed. Knowledge and understanding relevant to the claim is limited or lacks clarity. There is some discussion of the extent to which the claim is valid. • The response contains analysis, although this analysis lacks development. Relevant knowledge is used to interpret at least two of the sources but the link to the claim is limited. • There is some discussion on relevant and different points of view. The response includes a conclusion that is only partially supported by evidence.
10–12	<ul style="list-style-type: none"> • The demands of the question are understood and addressed. Knowledge and understanding relevant to the claim has some detail with some development. There is discussion of the extent to which the claim is valid, but the response lacks some detail. • The response contains critical analysis, although this analysis lacks development. Relevant knowledge is used to interpret two or more of the sources to support the discussion of the claim. • There is some discussion of different points of view. The response argues to a conclusion that is consistent with the arguments presented.

13–15	<ul style="list-style-type: none">• The demands of the question are understood and addressed. Knowledge and understanding relevant to the claim is detailed and well developed. There is detailed relevant discussion of the extent to which the claim is valid.• The response contains well-developed critical analysis. Relevant knowledge is used to interpret at least three of the sources and is used effectively to support the discussion of the claim.• Different points of view are identified and evaluated. The response argues to a reasoned and clearly stated conclusion that is consistent with the arguments presented.
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Table 4.12 Paper 3, Question 4 level descriptors from Study Guide, page 51.

Internal Assessment

The Internal Assessment (IA) in Psychology is a “research proposal” – that is, an outline of a study that you wish to conduct to further your understanding beyond the syllabus. The IA invites you to consider the power of psychology to improve people’s quality and/or quantity of life. This is your opportunity to work like research psychologists and design your own study. You do not actually have to complete the study – only the research proposal is submitted; therefore, practical implications are not a barrier. This means you may include things like brain imaging technologies, large sample sizes and longitudinal research in your project proposals, which would usually be unfeasible for high school Psychology students.

It is recommended that 20 hours of class time is spent on the IA process for both HL and SL students. The only difference between HL and SL for the IA is that for SL students the IA is weighted to count for 30 percent of your overall mark, and for HL students, the IA is weighted for 20 percent of your overall mark. Either way, it is a sizable contribution to your final score for Psychology, and one you have a great deal of control over, so it is worth putting the time and effort into doing the best research proposal you can. As the time you are recommended to work on it is so long, you should also choose a topic that interests you and that you will enjoy exploring for 20 hours.

The focus of the IA is on your ability to justify and articulate your decision-making when designing your piece of research, not on the feasibility or “perfectness” of the actual study. You are encouraged to follow your interests within psychology, even if the topic is not covered by the IB syllabus, and to utilize the full range of tools and approaches psychologists use. This means that issues in sports psychology, ergonomic psychology and well-being psychology are all possible avenues of investigation.

The high standards of ethical practices that the IB adopts is also relevant to the IA. The ethics in class practicals is covered extensively, and these same guidelines apply to the IA. However, as the IA is a purely hypothetical study, some guidelines are relaxed.

- Ingestion: No ingestion (giving food or drink to people or animals) is allowed in class practicals, but IAs using self-report data about dietary choices are allowed.
- Ethics: You are still learning about ethical procedures in psychology. The research proposal should be designed as if it would need to be approved by an ethics committee. Running trial ethical committees consisting of peers and teachers may be a useful teaching exercise and review process for IA ideas. This makes studies with unjustifiably unethical actions inappropriate – for example, studies including humiliation, forced participation or neglect.
- Animal research: IB Psychology is the study of human behavior. The use of non-human animals is forbidden in the IA.
- Choice of topic: While it would be unethical for high school students to actually interview depressed people for their class practical, it is acceptable to design a study for the IA using interviews of people with depression (as no possible harm will be caused because no study is going ahead). This allows you to explore sensitive topics such as mental health, body image, neurodiversity and cultural differences in the IA. Sensitive topics are often interesting for students to explore. However, teacher discretion is required here. Some topics that professional psychologists deal with may be difficult for teachers, students and examiners to read. In order to protect both students and adults from reading material that could be seen as harmful, the following topics must not be the focus of the Internal Assessment:

- abuse (sexual, physical, emotional)
- self-harm (including suicide)
- pornography, rape or other sexual acts
- serial killers or acts of torture.

This list is not exhaustive, and other topics may not be suitable. Your teacher can give you guidance about topics that might be considered sensitive or controversial in a local context.

The nature of the research proposal

You must identify a “population of interest” that you wish to study to better understand it. This population of interest may be as broad as “teenagers in Indonesia”, as targeted as “neurodivergent retired individuals in Bogota who play computer games to find connection” or as close to a participant’s lived experience as “the use of cognitive-based therapy apps to lower stress caused by the IBDP in teenagers in international schools in Frankfurt”. The research question should have relevance to the population of interest. While you do not need to be an expert in the population of interest or the issue you wish to investigate when you begin your IA, it is hoped that by the end of the process, you will be more informed on both.

Examples of potential topics for the IA

- An interview study of obese individuals in Poland to determine the effect of social norms around “clearing one’s plate” on obesity rates.
- An experiment on the effect of using different note-taking apps during high school IBDP classes to determine the highest rate of retention over a longitudinal period for IBDP students in Malaysia.
- An observational study on the gendered use of space of a school soccer pitch during lunchtimes over an eight-week period at an international school in Botswana.
- A questionnaire investigating which factors incarcerated people in Canada find most damaging to their mental health.

Research method

You must pick one of the following research methods.

- Experiment (true or quasi)
- Interviews – structured, semi-structured, unstructured or focus group
- Observations – naturalistic or controlled, overt or covert, participant or non-participant
- Survey/questionnaire

Note: mixed-methods studies are not appropriate for the IA.

Structure of the research proposal

The research proposal should be structured to reflect the four IA criteria:

- Introduction
- Research methodology
- Data collection
- Discussion

The research proposal should be submitted as a written report and can include tables, graphs or pictures if relevant to the report. The report must not exceed 2,200 words in length. This figure already takes into account the 10 percent leeway granted around the official 2,000 word count.

Introduction

The following are the key features of an introduction section to an IA.

- An aim that links the real-life problem to the population of interest. This will be extrapolated in the following section.
- A brief description of a real-life problem and an explanation of its impact on the population of interest. Identification of a real-life problem will often be the first step in many students' IA journey. They may be interested in the effects of social media on self-esteem, the role of mental health issues in body image or the protective benefits of mindfulness, for example. Once a problem of practice is identified, it must be linked to a population of interest, such as third-culture kids, urban teenagers in China, or Indigenous kindergarteners in largely white preschools in Australia.
- The findings and key conclusions of two pieces of relevant research. You are encouraged to read broadly around your real-world problem and population of interest. The IA must include a short literature review of two related studies (no procedural details are required, just the results and conclusions). You should explain why these studies are important to the current research proposal.

Research methodology

The research methodology section should include the following content.

- State what the chosen research method is out of the list of four methods above.
- A justification and explanation of the choice of research methods. You should answer the question: *What is it about the research method that makes it the most appropriate to investigate this particular research question?*
- An explanation of some procedural decisions made when planning the investigation. This explanation may include but is not limited to sampling technique, sample characteristics, design (if experimental), setting and process.
- An explanation of the relevant ethical considerations in conducting the study. Even though the study will not be undertaken, the ethical implications and your responsibilities as a researcher should still be explained. This section can also be used to include decisions taken to mitigate any ethical issues. If your proposal involves working with vulnerable populations and/or sensitive topics, the steps involved in doing this in an ethical fashion should be outlined here.

Data collection

It should be noted that no actual data will be collected. This section merely asks you to outline how you would collect the data if you were conducting the study. This section should include the choice of one data collection tool to measure behavior relevant to the aim of the investigation. Acceptable tools may include but are not limited to:

- a measurement tool such as a questionnaire or **Likert-type scales**
- an observation checklist or an interview schedule.

The data collection tool should contain a minimum of five items; for instance, for a questionnaire, there should be at least five questions. A copy of the data collection tool should be included in the appendix. This is necessary for completing the IA task; however, a complete collection of materials (such as informed consent forms, debriefing forms, used materials) does not need to be included and can just be outlined in the proposal.

You should include an explanation of the decisions made when creating the data collection tool. This may include an explanation as to why you created an open-ended survey as opposed to a closed one, selection or categorization of variables (identifying and operationalizing variables from the topic of interest), types of questions, use of measures, links to existing measures or materials, and an explanation of the validity of the tool or how the tool measures what it intends to measure.

Issues with data collection should be mentioned. You should discuss factors that may influence your findings. These may include, but are not limited to:

- participant variability
- practice effects (fatigue/boredom)
- order effects
- researcher bias
- response bias
- validity of the data collection tool
- controlling variables
- demand characteristics/social-desirability bias.

Discussion

The discussion section should include the following elements.

- A discussion of the potential findings of the investigation and the implication(s) for policy/practice. Just like real psychological researchers, you should think beyond the confines of your individual study. You should consider possible implications for the population of interest, future research, and policies or practices. This may be at a school community level (such as an anti-bullying program), a local level (a policy around the placement of food composting bins in the local community) or a national level (such as a national mental health initiative). You are also able to discuss practical implications for the population of interest, and potentially broader populations, in this section.
- A discussion of how researcher bias may have affected the investigation. You should note the command term “Discuss” here. This requires a critical analysis of both the strengths and the weaknesses of the proposal. This could include such issues as:
 - How has my personal history influenced the choice of topic?
 - How do my gender, culture and/or background and my relation to my potential participants influence my position on this topic?
 - How might my personal values or beliefs influence my interpretation of the data and/or my conclusions?
- A discussion of one additional method for investigating the same topic. You should note the use of the command term “Discuss” here and suggest one of the remaining three research methods from the list of four that could be used to investigate the

same real-world issue on the same population of interest. No research method is perfect; therefore, we will gain different insights from using different methods. You should include a discussion of the strengths of the alternative research method and how this may help account for some of the weaknesses of the research method chosen in the current proposal.

The presentation of the research proposal

The following details should be stated on the title page of the research proposal:

- title of the investigation
- IB candidate code (alphanumeric – for example, xyz123)
- date, month and year of submission
- number of words.

References and the appendices are not included in the word count but must be included in the report. The references are not assessed but must be included to meet the requirements of academic integrity. The selected research may be in any language, but there should be a translation of the title of research in the references to assist examiners. Research may be either qualitative and/or quantitative; both are equally acceptable.

Activity 152

Do you have any initial ideas for what you might like to study in depth for your IA? Some students will have an idea right away, and once they talk their idea through with their teacher, they will be ready to start. Other students might need to do some further investigation about certain topics or populations of interest to see what sparks their curiosity.

One way to approach finding a topic for your IA is to review what you have found interesting. Is there something you have covered in Psychology class that you wanted to go deeper into? Is there a topic or psychological phenomenon you have heard about before taking Psychology that you were excited to study, but which you now realize is not on the IB Psychology syllabus? Both of these would make good places to start when thinking about your IA. Maybe you were fascinated by studying compliance techniques and want to investigate more of them and how they are used in the wider world. Or maybe you are a sports fan and want to look at motivation's role in elite soccer performance.

Another approach would be to think of a population of interest. Is there a group you belong to, or one a family member belongs to, that interests you? Do you know someone who lives in a place in the world or comes from a culture that you are interested in? By investigating a population of interest, relevant psychological phenomena may reveal themselves and provide great topics for your IA. Maybe you are really into anime and all things associated with Japanese culture. Through your investigations of this, you might come across the psychological phenomenon of *hikkimori*, a culturally bound syndrome in Japan, which could form the basis of an IA. Maybe you are a musician and you have always wondered what other benefits playing a musical instrument brings to your cognitive capacity. This could form the basis of another great IA.

Extended Essay

The Extended Essay (EE) is your opportunity to study a topic chosen from one of your subjects in significant depth. The topic of interest is only limited by your personal interest. The EE will allow you to build research and writing skills through focused research guided by your supervisor. You will write up to 4,000 words, plus a 500-word reflection. The whole process takes around 40 hours, including three reflection sessions with your supervisor.

You may write an EE on a topic from the syllabus, including one of the HL extensions, such as “What role can technology play in improving memory?” Alternatively, you may choose to write an essay on a topic that is not in the syllabus, such as “Does bilingualism hinder cognitive development?” or “To what extent are errors in thinking and decision-making attributable to poor arithmetic skills?” It will be important to take time to define an area of study that is limited enough to be explored in depth but which has sufficient scope for an original response to develop. You might arrive at an area of study in stages: first, identify areas of the course that are of particular interest; second, read around the topic to find articles and studies of relevance; and third, write a carefully worded question that allows you to follow your initial interest and demonstrate your research. After the general topic has been defined, you must write a focused and appropriate question to allow a sophisticated response. You must be careful not to write an essay on a topic from “pop psychology” – for instance, “To what extent does listening to Mozart improve test scores?” You should only write essays that have a scientific basis using academic journal articles as the sources, not magazine and newspaper articles, social media posts and non-scientific websites.

The EE in Psychology is based on secondary research – in other words, studies carried out by psychologists and written up in academic journals and textbooks. You should look at a range of these, and some of them at least should be recent, although it may be possible, depending on the topic, to look at studies made over a period of time. This means you should not write your essay based on research you conduct yourselves.

You may explore the suitability of research methods in psychology, for instance, “To what extent can single-participant case studies, such as Henri Molaison, be useful for psychology research?” Additionally, you can examine ethical considerations in psychology, such as “To what extent do ethical considerations hinder the growth of psychological knowledge?”

The essay is marked externally relative to five criteria:

- A. Framework for the essay
- B. Knowledge and understanding
- C. Analysis and line of argument
- D. Discussion and evaluation
- E. Reflection

Criterion A: Framework for the essay (6 marks)

Do the research question, research methods and structural conventions followed provide an effective framework for the essay?

To achieve the upper markband of Criterion A:

- i. **Research question:** The research question is relevant, clear and focused in relation to the scope of the essay.
- ii. **Research methods:** Research methods that are suitable for the research question are explained and applied effectively.
- iii. **Structural conventions:** Structural conventions used in the essay effectively support communication of the research.



Maintain a positive relationship with your supervisor and consult regularly. Plan to speak early and often with your supervisor and listen carefully to the advice and opinions shared with you.

Ensure your research question is relevant to psychology, specific and directly linked to your essay's topic. A well-defined research question is essential, so discuss this with your supervisor. The topic must be associated with scientific psychology: you will use peer-reviewed research published in academic journals.

Use the standard structure for academic essays. A well-structured essay helps communicate your research clearly and concisely.

Ensure your research question and methods are manageable within the timeframe and the word limit; for example, it would be inappropriate to try to explore the psychology of a cult leader or a political figure in the time and word length available.

Criterion B: Knowledge and understanding (6 marks)

Does the student demonstrate knowledge and understanding of the subject matter being used in their research?

To achieve the upper markband of Criterion B:

- i. **Knowledge:** Comprehensive, relevant research materials are used to establish knowledge of the subject matter.
- ii. **Understanding – terminology:** Relevant terminology is used accurately and consistently to demonstrate understanding of the subject matter.
- iii. **Understanding – concepts:** Relevant concepts are explained and used effectively to demonstrate understanding of the subject matter.



Use only high-quality research material from reputable sources. This means only peer-reviewed articles from mainstream academic journals. If in doubt, discuss with your supervisor.

Accurately use psychology vocabulary throughout your essay. Consistent and correct use of psychology vocabulary shows a strong understanding of the subject.

Ensure you understand and effectively explain all your essay's key concepts. These explanations should show how well you understand the subject material.

Link your essay's findings directly to the psychological concepts you are discussing to show your understanding of how the research and concepts are related.

Keep your essay focused by ensuring all the information, terminology and concepts you include are directly relevant to your research question.

Criterion C: Analysis and line of argument (6 marks)

Does the student analyze the information presented in the essay and produce a line of argument?

To achieve the upper markband of Criterion C:

- i. **Analysis:** Analysis in the essay is effective and consistently produces relevant findings.
- ii. **Line of argument:** A clear, sustained line of argument links the research question, research findings and conclusions.



Ensure your analysis consistently leads to relevant and meaningful results that support your essay's topic and address the research question.

Develop a clear and consistent line of argument throughout your essay. Every section of the essay should refer to the research question and contribute to the essay's overall argument.

Ensure your analysis directly ties your research findings to your research question to create a strong, coherent argument.

Develop your argument step by step, leading the reader from your research question through the findings you have gathered in your research to the essay's conclusion. If there are gaps in the argument, more research may be needed. This well-structured argument is important in answering the research question.

Ensure your line of argument is consistent from start to finish. Do not introduce new arguments or contradictions that could weaken your overall argument.

Criterion D: Discussion and evaluation (8 marks)

Does the student discuss the findings and evaluate the essay?

To achieve the upper markband of Criterion D:

- i. **Discussion:** A balanced discussion of the significance of the findings is fully supported by appropriate evidence.
- ii. **Evaluation:** The effectiveness of the essay is evaluated, with relevant strengths and limitations considered and explained.



The essay's discussion should be balanced, highlighting research that both supports and refutes your argument. Balanced does not mean you have to give equal weighting to both sides, just that your discussion refers to both sides of an argument.

Make sure every point made in the discussion is fully supported by appropriate evidence that is referenced correctly. This strengthens the argument, makes the discussion more convincing and makes the essay more readable.

Critically assess how well the essay's discussion answers the research question. Consider what seems to work well and where there might be room for improvement. Discuss this with the supervisor.

Clearly identify and explain the essay's strengths and limitations. Being open about what could be improved shows a deeper level of understanding and a high degree of academic humility.

Ensure the essay is balanced between discussing the research and evaluating the overall effectiveness of the argument. Both elements are important for reaching the upper markband.

Criterion E: Reflection (4 marks)

Does the student evaluate the effect of the Extended Essay learning experience on them as a learner?

To achieve the upper markband of Criterion E:

- i. **Evaluative:** Reflection on the Extended Essay learning experience is consistently evaluative and includes specific examples.
- ii. **Growth:** Reflection consistently shows evidence of the learner's growth and transfer of learning.



Ensure your reflection is consistently evaluative. How has your research and the process of writing the essay affected you? For example, were any of your preconceptions changed during your research? Did you find that some research contradicted other research? Did you learn secondary knowledge about the topic that you could not include in your essay?

Include clear, specific examples from your experience to demonstrate what you learned.

Reflect on how working on the essay helped you grow and develop as a learner. Did it challenge your critical-thinking skills? Did it challenge your knowledge of statistics or research methods? Discuss any new skills, insights or perspectives you developed.

Discuss how the skills and knowledge you gained while creating the essay have been or could be applied to other areas of your learning. This shows that your growth goes beyond just this one project.

Approach your reflection honestly and with an open mind. Acknowledge the challenges you faced and describe how you overcame them (even if that was seeking help from the supervisor), as well as how these experiences contributed to your development as a critical thinker, researcher and writer.

Tips for good practice

Time management and organization

- Time management is a more valuable skill than even writing a research essay. It will benefit you in all areas of your life.
- Create a timeline – start date, end date and interim dates.
- Start your EE as early as your school and supervisor will allow and aim to submit your draft well ahead of time. Research takes more time than writing the essay itself, and the quality of the essay depends on the quality of the research. An EE takes a lot of time, so leaving until “later” will not result in a good essay.
- Break down your essay task into smaller tasks and set deadlines for each. Develop self-discipline and motivation to stick to your schedule to avoid stress.
- Focus on high-impact tasks first, such as developing your research question and gathering sources. This will ensure you make steady progress.
- Focus on the most important parts of your essay.
- Regularly check your progress against your timeline.

Organizational skills

- Maintain a record of your sources, notes and ideas. This will help you stay organized and make it easier to reference your materials later. Copy every reference for every source consulted and paste them into one document so that you do not have to look for references after you have finished your essay.
- Write and plan your essay using a cloud-based platform to minimize the risk of losing your work.
- Use clear file and folder names to keep all your documents, drafts and resources well-organized.
- Take advantage of citation management software to keep track of your sources and generate citations automatically.

Research skills

- For a psychology essay, use only academic journal articles. Google Scholar™ is a simple source. The supervisor may suggest others, and your school may have access to academic journals or databases.
- Be efficient in your searches by using advanced search techniques such as Boolean operators and filtering by date or type to find high-quality, relevant sources.

- Paraphrase correctly, use quotation marks for direct quotes and cite your sources accurately. Speak with your supervisor early in the essay process to be sure you are doing this correctly because the consequences of incorrect referencing are significant.

Applying critical-thinking skills during research

- Always apply critical thinking to the research process. Consider your question in relation to the six key concepts in psychology to provide and to assess the credibility, relevance and bias of the sources you are using to support your essay. This will ensure your essay's argument is based on reliable and accurate information.
- Examine the underlying assumptions of your sources and your own arguments. Ask if these assumptions are justified and how they affect the conclusions.
- Critically assess the quality and relevance of evidence used in the argument. Consider each source's credibility, the methodology used and whether the evidence directly supports the conclusions reached.
- Be alert to biases in your essay's sources and in your own perspective. Evaluate how these biases may affect the interpretation of information.
- Break down complex arguments into simple elements and assess the logical flow of the reasoning. Check if the conclusions follow logically from the arguments.
- Consider different perspectives and counterarguments related to your research question and include these in the essay to show balance and open-mindedness. It will also help in understanding the issue's full scope and strengthen your argument by addressing potential counterarguments.

Writing tips

- Write concisely. This means using as few words as possible so you can include more content within the word limit.
- Write in a formal, academic tone. You will experience this as you read journal articles. Discuss this with your supervisor.
- Do not repeat the same ideas in different words. Once you have made a point, move on to the next point.
- Choose simple, precise words over complex or vague ones. Avoid filler words like "very", "really", "actually" and "basically", which degrade the quality of your writing.
- If two sentences express closely related ideas, merge them into one.
- Your reader/audience is the marker who has considerable knowledge of psychology. Trust your reader's intelligence by providing enough explanation to make your point clear, but do not over explain concepts that are likely already understood by the reader.
- After writing the draft, trim any unnecessary words, phrases or sentences. Focus on keeping only what is essential to the essay's argument.
- Format the essay as per the IB's requirements: cover page, page numbers, font, font size, line spacing, margin sizes, etc.
- Proofread the essay for spelling, grammar and punctuation errors. Ask a friend/classmate to proofread the essay.

Psychology and Theory of Knowledge

Theory of Knowledge (TOK) is a compulsory philosophy course as part of the IB Diploma Core together with CAS (Creativity, Activity, Service) and the extended essay. It combines critical thinking and well-known subject disciplines called Areas of Knowledge (AOKs). These are:

- history
- the human sciences
- the natural sciences
- mathematics
- the arts.

There are also optional themes:

- knowledge and technology
- knowledge and language
- knowledge and politics
- knowledge and religion
- knowledge and Indigenous societies.

A good IB student (and teacher) is characterized by skepticism. This means we should be constantly questioning how we can be certain about what we know. For example: What counts as a fact in history? To what extent is it legitimate for a researcher to draw on their own experiences as evidence in their investigations in the human and even natural sciences? How can it be that scientific knowledge changes over time? Can art change the way we interpret the world? Is mathematics created or found? When there are competing explanations for a phenomenon (as there often are), how do we choose which one is more valid?

Therefore, the main assumption of TOK is that knowledge is not necessarily definitive, but constantly created and changed through human processes. This means we need to question what we know and how we came to know it. This basic idea underpins the TOK course and is explored through your assessments in TOK, the knowledge framework which helps structure the course, the optional themes as well as the AOKs and the 12 TOK concepts. These are explored individually below.

Assessment in TOK

There are two key components of TOK assessment.

- The TOK Exhibition, which is an internally assessed element (evaluated by your teacher), consists of a written exploration of up to 950 words based on a TOK prompt/question. This exploration involves discussing three chosen objects, allocating approximately 300 words to each.

There are 35 different assessment prompts provided in the IB's TOK Guide. Each prompt poses a general knowledge-related question. For example, prompt 25 asks: "How can we distinguish between knowledge, belief and opinion?" The TOK framework, concepts and optional units can assist you in understanding and linking the prompts to your chosen objects. The objects need to have a high degree

of specificity that can then be used to address the prompt; they should not be generic. For example, a metal water bottle is generic. However, an aluminum water bottle that was used in a school environmental awareness campaign has a high degree of specificity as it might raise questions about how we can be certain it is better for the environment.

- The TOK Essay is externally assessed by an IB examiner (although your teacher might provide an initial mark). You will write up to 1,600 words in response to one of six provided essay questions. The questions are usually made available early in the first semester of your second DP year. You will be expected to address the question in the context of two AOKs, which may be named in the question. In writing your essay, you are expected to use the TOK concepts and apply the TOK framework. For example, in the human sciences scope section of the framework, there is a question about the reliability of predictions (*Are predictions in the human sciences inevitably unreliable?* page 30) and there is a question about the role of models (*What role do models play in the acquisition of knowledge in the human sciences?* page 30). Therefore, you can use these questions to develop ideas and arguments as well as analysis.

Both the TOK Exhibition and the TOK Essay encourage contemplative thinking about the nature of knowledge and the conditions that may affect our ability to be certain what we know is true or credible.

For detailed guidance on TOK, you should consult the IB's TOK Guide.

Areas of Knowledge and themes

The IB has identified five AOK and five optional themes. The optional themes are linked to contemporary ideas and processes that have an impact on ourselves and our world. You will study a minimum of two of these. They are helpful for focusing your Exhibition (TOK IA).

The TOK optional themes are:

- knowledge and technology
- knowledge and language
- knowledge and politics
- knowledge and religion
- knowledge and Indigenous societies.

The AOKs may be likened to academic departments; they are clearly defined fields of study. It is assumed that within each AOK, a dynamic process of knowledge creation takes place that is influenced by the methods used to create and communicate it and then, eventually, when people consume it. At each stage, the process is influenced by human factors such as the limitations of the data collection or creation methods, bias and language issues that impact how it is communicated, and then issues with bias or understanding/misunderstanding when the knowledge reaches us as knowers.

This continuous interaction between human processes and knowledge forms the core of knowledge production and evolution in each AOK.

The IB has identified the following AOKs:

- history
- the human sciences
- the natural sciences
- the arts
- mathematics.

The idea of separating knowledge into different AOKs assumes that the production of knowledge process is different in each of the AOKs and that this difference has an impact on the form, type and relevance of the knowledge being produced. However, the definitive nature of the AOKs as discrete categories raises questions regarding to what extent they themselves create issues relating to knowledge. For example, psychology is a subject that is usually placed within the human sciences; however, it borrows some of the assumptions and methods of the natural sciences. It might also be argued that when psychology researchers use more scientific methods (such as experiments, brain scanning techniques and genetic research), it produces different knowledge than when it uses more human science methods such as qualitative data gathering and the use of the researcher as part of the research process.

However, the human sciences also emphasize interpretive and qualitative approaches that can prioritize the subjectivity of human experience and the social contextuality of behaviors. This perspective may lead to a deeper understanding of the sociocultural variables that influence mental processes and behaviors, such as historical and cultural contexts. However, the natural sciences may favor quantitative methods that seek to establish general laws of behavior and cognitive functions through empirical and experimental research. This approach aims at objectivity and repeatability, potentially overlooking the nuances of individual human experiences. These considerations raise questions regarding to what extent the TOK AOKs are definitive in nature, and on what basis a subject can be placed in one AOK and not another.

The blending or shifting of psychology between these domains not only affects the types of knowledge produced but also impacts how that knowledge is perceived and used. For instance, knowledge derived from natural science methods is often seen as more “reliable” or “scientific” due to its quantifiable and reproducible nature, which can influence funding decisions, academic curricula and public policy. Conversely, knowledge from human science approaches may be seen as more “insightful” or “holistic”, emphasizing the importance of understanding meanings and contexts that a more scientific approach might miss.

This dichotomy also raises ethical and methodological questions. For instance, how can psychological research balance the need for both subjective understanding and objective analysis? Additionally, how do these methodological choices affect the participants in research, particularly when dealing with vulnerable populations or complex psychological phenomena?

Ultimately, the placement of psychology within the realms of human or natural sciences shapes not only what is considered valid knowledge, but also who decides what knowledge is valuable. This influences educational approaches, therapeutic practices and even the broader societal understanding of what psychology is and should be used for.

TOK concepts

TOK introduces 12 key concepts that are woven through the course. These concepts are:

- evidence
- interpretation
- explanation
- culture
- certainty
- power
- objectivity
- values
- truth
- justification
- perspective
- responsibility.

Many, such as culture, perspective and values, are tightly interwoven with each other. However, they are introduced separately below and then discussed in a worked example. Finally, they are discussed in light of the psychology concepts. Ultimately, the TOK key concepts raise questions about how we can certain a claim is true.

Evidence

Evidence refers to information and data gathered through observation, experimentation or research that supports or refutes a claim or hypothesis. In psychology, evidence for a claim can come from various sources, including controlled experiments, case studies, surveys and observations. However, factors such as researcher bias, participant expectations and limitations of research methods can all influence what would be considered strong evidence. Therefore, the way that psychologists *measure* behavior has an impact on the type of evidence collected.

Certainty

Certainty refers to a state of being sure about something, often with an assurance that the information is accurate, reliable and supported by strong evidence. However, it should be noted that just because something is reliable (repeatable over time) does not mean it is valid or correct. This means that certainty can always be questioned. The human desire for certainty can lead to the acceptance of psychological findings that appear correct even when the evidence is not fully conclusive. It is important to be critical and acknowledge the limitations of psychological knowledge and the processes that create it. For example, in Maguire's research with the hippocampus, spatial memory and types of driving, she explicitly acknowledges that the nature of her methodology (quasi-experiments) meant that complete certainty regarding cause-and-effect relationships was difficult to establish.

Truth

Truth refers to the quality or state of being true, factual or correct as confirmed by evidence, logic or consensus. It raises questions about how we can truly know what is true and what is not true, and there can be no single authority figure who dictates truth in psychology. Questions about how we can be certain about what is true underpin the TOK course and philosophy. Generally, widely accepted findings with strong supporting evidence are considered closer to the truth, but this raises questions about what happens when there is conflicting evidence. Ongoing research and replication can lead to revisions of what was previously thought to be true. It is therefore important for psychology researchers to accept uncertainty as part of the research process and assume that all claims are contestable.

Interpretation

Interpretation refers to the process of explaining the meaning of information or data, often influenced by one's *perspective* or theoretical framework. While psychology

researchers with relevant expertise and experience in the specific area of study are typically considered more reliable sources for interpreting findings, the human sciences are characterized by debates over the interpretation of data and the implications for understanding human behavior. Furthermore, consulting reputable peer-reviewed research journals can provide a more trustworthy perspective than popular media interpretations. However, the idea of peer review is that researchers can test their ideas in an academic arena where their interpretations are challenged and then improved.

Power

Power refers to the ability or capacity to influence others, direct outcomes or control resources, often affecting the dynamics within psychological research and practice. In psychology, power dynamics can significantly influence research outcomes and interpretations. For instance, the power held by funding sources can shape the direction of research, potentially leading to *biases* in study design or the interpretation of results. Additionally, the hierarchical relationship between researchers and participants can affect the responses of participants, potentially leading to skewed data. The power imbalances within psychological practice and research necessitate ethical considerations and transparency to ensure that power is used *responsibly* and does not undermine the integrity of psychological science.

Justification

Justification refers to the reasoning or argument presented to support or explain why a particular belief, action or method is appropriate or necessary. Justifying knowledge in psychology often relies on replicability and ethical considerations set by professional standards organisations such as the American Psychological Association or the British Psychological Society, as well as individual university ethics review boards. Furthermore, justifying the validity of a claim may be dependent on the credibility of the methods used, as well as any statistical and/or qualitative analysis of the results. These can vary between researchers and methodologies.

Explanation

Explanation refers to providing a clear understanding of how or why something happens, often used in psychological theories to account for human behavior or mental processes. A good explanation in psychology is often seen as parsimonious, whereby the simplest explanation is chosen that adequately accounts for the observed phenomenon even though this idea is not fully accepted or agreed upon across researchers. Explanations should also be falsifiable – meaning there should be a way to disprove it if it is wrong – to meet the scientific philosophical needs that underpin psychology research. Finally, it might be argued, a good explanation should be consistent with existing psychological knowledge and theory, and if it is not, then it would require a greater burden of evidence.

Objectivity

Objectivity refers to the practice of remaining unbiased and unprejudiced, basing conclusions solely on facts and evidence without personal feelings or opinions influencing outcomes. Relating to the key concept of *bias*, this raises philosophical questions about to what extent this is actually possible, and even desirable, as well as what counts as a fact in psychology. For instance, it might be that researchers' own subjective experiences can increase the credibility of psychological research if they are researching a phenomenon that they themselves have experienced. Furthermore, there

will be disagreement regarding the interpretation of any results, as well as what could be seen as certain.

However, in most areas, psychology strives for objectivity, but achieving complete neutrality is challenging and, therefore, it is better to think of it as something researchers aim for, rather than reach in a definitive way. For example, researchers' backgrounds, values and expectations can influence their interpretations, which is why they have to be reflexive and allow their readers access to their ways of thinking. This is an area where psychology may differ markedly from the natural sciences. However, using standardized methods, blind studies and triangulation (using multiple research methods and theories) can all help minimize bias and push the research to a more objective position.

Perspective

Perspective refers to a particular attitude toward, or way of regarding, something – a point of view that can shape understanding and interpretations. Different theoretical perspectives in psychology (psychodynamic, humanistic, cognitive, etc.) emphasize different factors that influence human behavior. This highlights how perspective shapes the types of questions psychologists ask and the explanations they develop.

Culture

Culture refers to the shared beliefs, norms, values and practices that characterize a group of people and influence their behaviors and interpretations. Culture profoundly impacts psychological research, influencing both the participants in a study and the interpretation of data. Cultural backgrounds can affect participants' behavior, cognition and emotional expressions, which in turn may lead researchers to different conclusions depending on their own cultural context. Cross-cultural psychology attempts to understand these differences and commonalities, but cultural *bias* can still influence research questions and interpretations. It raises questions about to what extent researchers of different cultures should be able to research participants from different cultural backgrounds to their own, and what kinds of considerations (if any) need to be in place during the research process.

Values

Values refers to the important beliefs or ethical standards that guide behavior and decision-making within a society or individual. Values can play an important role in psychology by guiding the ethical standards of research, the choice of research topics and the methods employed. Personal and societal values influence what researchers consider important to study and how they interpret their findings. For instance, values concerning human welfare can drive research into areas like depression, stress and resilience, aiming to improve quality of life. Ethical considerations, deeply rooted in values, also dictate how studies are conducted, ensuring the welfare of participants and the integrity of research.

Responsibility

Responsibility refers to the obligation to act ethically and with accountability, especially in upholding ethical standards and ensuring the integrity of actions. However, this immediately raises questions about which ethical standards and whose integrity responsibility can be judged by. Psychology researchers usually abide by ethical standards set down by Research Ethics Committees, which create definitive standards for research, and researchers have a responsibility to abide by them. Researchers

have a responsibility to their participants to treat them with respect and protect their privacy. There is also a responsibility to the scientific community and the general public to report findings truthfully, avoiding exaggeration and acknowledging limitations. Furthermore, when psychological research is applied, such as in therapeutic settings or organizational contexts, practitioners have the responsibility to use evidence-based practices and consider the best interests of those affected by their interventions.

Example

SSRIs and depression

The following example shows how the TOK concepts can have great importance within psychology research.

SSRIs are a class of medications widely used to treat depression and anxiety disorders. They work by blocking the reabsorption (reuptake) of serotonin into neurons, making it more available to improve transmission of messages between neurons. The use of medication assumes that low levels of serotonin are linked to increased risk of depression. From this **perspective**, it is beneficial to keep serotonin active for longer periods of time. This is why drugs that inhibit the reuptake of serotonin are thought to be useful.

However, researchers have raised concerns about the widespread use of SSRIs following a significant review that found no concrete **evidence** linking low serotonin levels to depression. This immediately raises questions about how researchers can be certain that one assumption is more correct than another. This is particularly important in areas where patients are being treated with medication that affects their daily lives. It also places an emphasis on the methodologies researchers use to generate conclusions in psychology. For example, Moncrieff et al. (2023) examined the association between depression and serotonin levels through a meta-analysis of major studies up until December 2020. A meta-analysis is a statistical technique used to combine the results of multiple studies on the same topic in order to derive a more comprehensive understanding or conclusion about that topic. By aggregating data from various studies, a meta-analysis may provide a clearer picture of the effects or relationships being studied, often increasing the statistical **power** and resolution compared to individual studies. The results from 17 studies showed no consistent **evidence** linking low serotonin levels or activity with depression. Some findings even suggested that long-term antidepressant use might actually reduce serotonin levels, but overall, there was no support for the hypothesis that depression is caused by decreased serotonin activity. This raises questions about whether SSRIs are an effective treatment for psychiatric disorders. SSRI prescriptions have surged since the 1990s, with a notable percentage of adults and teenagers in the UK, for example – and millions globally – now using these medications.

Therefore, researchers have a **responsibility** not only to research important questions in an ethical and conscientious way, but also to acknowledge competing claims that contradict their own findings.

For example, other experts, including the Royal College of Psychiatrists, have defended the effectiveness of SSRIs when used as antidepressants, cautioning patients against discontinuing their use without medical advice. They argue that antidepressants remain a viable treatment option, emphasizing the importance of making informed decisions about mental health treatments.

However, a further key consideration in research and in the TOK Guide is the role of funding and how this might impact knowledge creation. For instance, Ebrahim et al. (2015) evaluated 185 meta-analyses of SSRI research and found that 80 percent had some sort of connection to the pharmaceutical industry, either through sponsorship or conflicts of interest whereby one or more authors were either industry employees or independent researchers receiving any type of industry support, including speaking fees and research grants. They also found that industry-sponsored trials reported favorable outcomes for SSRIs 78 percent of the time, which compared with 48 percent in independently funded trials, suggesting a clear link between funding and research outcomes. John Ioannidis, an epidemiologist at Stanford University School of Medicine, USA even argues that pharmaceutical companies should be restricted from funding meta-analyses to safeguard objectivity.

Therefore, in this example, the 12 TOK concepts are interwoven because they raise key questions about how psychology research can impact people's lives. How **certain** can researchers be that SSRIs are an effective treatment for psychiatric disorders? Furthermore, the concepts of **objectivity**, **justification** and **evidence** are relevant because while some researchers use **evidence** from their research to doubt the efficacy of SSRIs, other researchers such as Geddes and Cipriani (2004) argue that SSRIs remain useful drugs. Therefore, by what **justification** can researchers accept one **explanation** but reject another? There is also the issue of **cultural** norms impacting how people view the use of drugs to treat mental illness. For example, in the UK, prescriptions for antidepressants have risen dramatically since the 1990s, with one in six adults and 2 percent of teenagers in England now being prescribed them (Gregory, 2022). Sleath and Shih (2003) argue that prescribing norms vary by country for cultural or sociological reasons. Pagura et al. (2011) argues that in the USA almost one quarter of antidepressant prescriptions are actually to people without serious psychiatric conditions. Moreover, in many traditional or Indigenous societies, mental health issues like depression are often treated with more holistic approaches or traditional healing practices, while in some East Asian countries such as Japan and China, there tends to be a preference for other forms of treatment over SSRIs, such as traditional medicine or lifestyle modifications. Therefore, there are questions about to what extent **cultural values** lead researchers down certain avenues of investigation but not others. Finally, there is a problem with the concept of **truth**. We should assume that most, if not all, researchers are decent people who want to find the truth of a phenomenon – but how can truth be found in the midst of competing claims?

This example demonstrates that psychology research produces work that is contestable because the knowledge is influenced by so many factors. This is why we do not use words such as “proof” and “prove” in psychology and our writing style is non-definitive. It also illustrates why TOK and psychology are so interwoven and why a good psychology student (and teacher) is also proficient in TOK.

TOK and psychology concept integration

The six key psychology concepts of bias, causality, change, measurement, perspective and responsibility can be linked to several of the TOK concepts. These connections emphasize how psychology's methodological rigor and ethical considerations align with TOK's broader questions about knowledge and meaning.

In psychology, *bias* can arise in research design, interpretation or participant behavior, affecting the validity of results. This links to the TOK concept of *objectivity*, where the pursuit of unbiased knowledge is crucial but difficult to achieve completely. Psychology acknowledges biases (for example, cultural, researcher or confirmation bias), paralleling the TOK concern with how perspectives shape understanding. It can also be noted how reflexivity in psychology helps reduce bias, which is aligned with TOK's challenge of how to achieve full objectivity.

Establishing *causal* relationships can be seen as one of the primary goals in the human sciences, often requiring careful experimental control and statistical analysis. This aligns with the TOK concept of *explanation*, where understanding the “why” behind phenomena is essential. However, causal relationships in psychology are often tentative, raising questions about how certain we can be regarding exact causes of behavior. Furthermore, psychological research frequently explores how behaviors or mental states change over time or under specific interventions, which also raises questions about the permanence and certainty of such findings. In these ways, the TOK concept of *certainty* is of paramount importance for psychology research. While psychology offers evidence for change (for example, in developmental or therapeutic settings), it shares with TOK an understanding that certainty in such findings is often provisional, subject to further testing and revision over time – raising further questions about how facts can be established and known in the subject.

Moreover, *measurement* in psychology involves operationalizing variables and ensuring reliability and validity, often through quantitative methods such as surveys and experiments. The TOK concept of *evidence* highlights the need for robust data to support knowledge claims. In psychology, evidence can be complicated by the subjectivity of human behavior, reflecting TOK's focus on how evidence is collected, interpreted and contested across different areas of knowledge.

Another important consideration is that psychological approaches (cognitive, biological and sociocultural) offer different lenses through which behavior can be understood, highlighting the TOK concept of *perspective*. Both fields recognize that perspective influences not only the questions asked but also the interpretations of data. In psychology, *perspective* shapes research design and conclusions, just as in TOK, where the knower's viewpoint is integral to understanding knowledge claims.

Finally, ethical *responsibility* is paramount and underpins the IB DP Psychology course, and any research that involves human or animal subjects. This links to both *responsibility* and *power* in TOK. Psychologists have a responsibility to conduct ethical research, protect participants and apply findings responsibly. This parallels the TOK focus on power dynamics in knowledge creation, where those with authority (researchers, for instance) must wield their influence carefully to avoid harm or bias in the dissemination and application of knowledge.

Knowledge and the knower

- What shapes our perspectives as knowers?
- How much of our knowledge depends on our interactions with other knowers?
- Is the truth what the majority of people accept?

As well as the AOKs and optional themes, you are expected to consider your relationship with knowledge as part of the “Knowledge and the knower” core theme.

This has particular relevance to psychology because it provides an opportunity for you to reflect on what shapes your interest in human beings. This can include areas such as where your values come from and how you make sense of and navigate the world, as well as how you come to know the academic knowledge produced by psychology. Furthermore, the knowledge and the knower theme considers aspects such as the impact of the different communities of knowers to which we belong, and how knowledge is constructed, critically examined, evaluated and renewed by these communities. It also includes reflection on how our interactions with others and with the material world shape our knowledge.

Therefore, the core theme encourages careful and critical consideration of your own relationship with claims. Like all aspects of TOK, it highlights the importance of not simply accepting claims at face value, and then explores how this can be reconciled with a recognition that many situations require us to make decisions without possessing absolute certainty. This is particularly true in psychology because there are often competing alternative interpretations of human behavior that can have real-world consequences, such as deciding which treatments are the most effective for certain behaviors.

Overall, the core theme encourages you to consider both the power and the limitations of the tools that you have at your disposal as knowers and thinkers, and to become more aware of your biases and assumptions. It asks you to be open-minded and to consider the importance of caring about how knowledge is used and controlled and how this impacts both how you come to know the world and how we treat other, sometimes vulnerable or marginalized groups.

Knowledge and psychology

The human sciences encompass a diverse array of disciplines, including psychology, social and cultural anthropology, economics, political science and geography. These fields share a unifying objective: to understand and explain human existence and behavior. Furthermore, the coexistence of contrasting approaches within single disciplines offers additional avenues for TOK inquiry. For example, in psychology, different approaches compete to explain abnormal behavior, attachment styles and the origins of gender and intelligence, which means marshaling uncertainty is a key characteristic of the psychology student and teacher.

In this section, we have taken some human science knowledge questions from the TOK Guide and adapted them for psychology. This should give you a starting point for understanding how TOK and psychology are intertwined.

Question: What are the main difficulties that human scientists encounter when trying to provide explanations of human behavior?

Human scientists face challenges in explaining behavior due to the complexity and variability of psychological, social and cultural influences. The subjective nature of experiences and ethical constraints further complicate experimental control and replication, hindering the establishment of definitive, universally applicable conclusions. There is also the consideration that in psychology, humans are being researched by other humans. For instance, researchers may unintentionally project their own beliefs, biases and cultural backgrounds onto their studies, which can influence the interpretation and outcome of the research.

Question: To what extent is it legitimate for a researcher to draw on their own experiences as evidence in their investigations in psychology?

Drawing on personal experiences in human sciences research can be legitimate to provide initial insights or generate hypotheses, especially in qualitative studies where subjective perspectives enhance understanding. For example, in sensitive areas such as psychiatric illness, or in relation to victims of emotional or drug abuse, researchers may be spurred to further their understanding of their own experiences in an academic context. However, relying solely on personal experiences may limit the ability to be objective, and raises questions about generalizability. Therefore, it is important that researchers complement personal experiences with empirical data and peer-reviewed evidence from less emotionally invested researchers. This approach helps balance subjective viewpoints with scientifically verifiable information, ensuring broader applicability and rigor in research findings.

For instance, “insider research” refers to a research approach where the researcher is also a member of the group, organization or community being studied. This positioning gives the researcher a unique perspective, often allowing for deeper insight into the social dynamics, norms and processes within the context studied. It can be seen in participant observation research, whereby the researcher immerses themselves in a particular social setting or group. Bonner and Tolhurst (2002) identifies key advantages of being an insider researcher, such as having a greater understanding of the culture under investigation and not altering the flow of social interaction unnaturally, while having an established intimacy that promotes both the telling and the judging of truth.

However, being an insider also presents specific challenges and considerations. For example, as insiders, researchers generally have easier access to information and can establish rapport more quickly with participants since they share common experiences and understandings, while familiarity with the context can enable insider researchers to obtain more nuanced data. However, insider researchers have to navigate complex ethical landscapes due to their dual roles as both member and observer; therefore, issues of confidentiality, power dynamics and bias become highly relevant.

Example

Power relations in South African higher education: An insider’s perspective

Nompilo Tshuma (2021) used an insider approach to research power dynamics in South African higher education in relation to technology. She found that by using videos and student-generated content, white academics were able foster discussions with Black students that might otherwise have been difficult given the racial power dynamics. She concluded that the technology allowed teachers to facilitate cultural transformation within their classrooms by approaching difficult topics from a student-centric perspective.

Insider research demonstrates how subjectivity and reflexive practices, whereby the researcher reflects on their own positions and biases in relation to the research, are a key characteristic of psychology research. For example, Tshuma writes about the tension between her roles as researcher, university employee and PhD student. She was also aware of the broader context of the university’s role within the local town, steeped in the history of apartheid and its ongoing struggles with inequality, which added layers of complexity to her role as an insider researcher. In this way, she had to be sensitive to the impact her research and conclusions might have had on

university relations with the local people and students. Furthermore, her multiplicity of roles led to conflicts in expectations and responsibilities. For instance, a senior academic participant had expectations that participating in Tshuma's research would provide them with direct and preferential access to educational technology. This expectation placed Tshuma in a challenging position. On the one hand, she needed to manage her professional responsibilities and boundaries as an employee tasked with providing equitable support to all academics. On the other hand, she felt pressurized to cater to the participant's demand for access to technology, to facilitate her research data collection and maintain a positive relationship, which was crucial for her PhD research.

Another example of the kinds of knowledge produced by a reflexive researcher is when Tshuma became aware of her own dismissiveness towards a working-class Black student who had expressed anxieties about growing up poor in South Africa. It caused her to re-examine her own assumptions about race and poverty. For instance, she came to recognize the problematic nature of the "digital natives narrative" in a South African context, whereby it is assumed that students are digitally literate because they have grown up with technology all around them simply by being born after 2000 (Prensky, 2001). Tshuma came to recognize that this narrative is particularly problematic in the South African context, where there are gross social as well as academic inequalities that result in what Brown and Czerniewicz (2010) term "digital apartheid", whereby many young Black students do not have access to basic technologies. These researchers determined that age is not a determining factor in students' digital lives; rather, their familiarity with and experience of using technology is more relevant. However, it was the initial interaction and dismissiveness that had caused Tshuma to go back and reevaluate her experiences with the student that led to her increased understanding of the participant's relationship with technology by researching around the topic and listening to the student's anxieties more closely.

Therefore, Tshuma's insider research on power dynamics and technology in South African higher education shows the legitimacy of using personal experiences in psychology research. Her reflexivity revealed biases and deepened her understanding of participants' struggles – in relation to digital inequality, for instance – which she was able to communicate to her readers, and which made her a more sensitive teacher. This approach validates the use of personal experiences as it allows researchers to critically examine their own assumptions and better interpret the complex social dynamics in their studies.

Question: Is it possible to eliminate the effect of the observer in the pursuit of knowledge in psychology?

It may be argued that it is not entirely possible to completely eliminate the effect of the observer in the human sciences, and in psychology specifically. Researchers inevitably bring their own biases, perspectives and cultural contexts to their studies, which can influence both the collection and interpretation of data. Furthermore, the mere presence of an observer can alter the behavior of participants, a phenomenon known as the observer effect. These human factors make it challenging to achieve total objectivity and detachment in studies involving human participants. However, the development of AI may allow researchers to claim that objectivity can be achieved by removing the human observer from the research process. For example, Ryali et al. (2024) used new AI that was able to provide highly replicable and generalizable data about behaviorally relevant sex differences in human brains. In this way, AI

was able to spot differences in male and female brains that human researchers could not. The findings help to resolve a longstanding controversy about whether reliable differences between males and females exist in the human brain and also advance the understanding of differences in psychiatric and neurological disorders between males and females. The study also demonstrates that AI can actually provide robust, generalizable and interpretable neurobiological measures of sex differences, as well as providing interesting new ways of conducting research on humans in the future.

Question: *Is human behavior too unpredictable to study scientifically?*

The scientific method promotes the notion that phenomena can be studied using systematic observation, controlled experimentation and empirical reasoning to draw conclusions that are replicable and verifiable. However, human behavior may not necessarily lend itself to these ideas. This is because human actions and reactions are influenced by a complex interplay of psychological, social, cultural and environmental factors that can be difficult to isolate and control in experimental settings. Additionally, the subjective nature of individual experiences and perceptions adds layers of complexity that challenge the predictability and repeatability essential to the scientific method. Moreover, there are potentially fundamental differences between how the human and natural sciences interpret “science”, the methodologies they employ for data collection, and their approaches to testing the validity and reliability of hypotheses. For example, the use of questionnaires and polls within the human sciences raises questions about the neutrality of language, leading questions, sampling and selection biases, and the possibility of respondents providing untruthful or misleading answers.

Question: *How can we know when we have made progress in the search for knowledge in psychology?*

Progress may be marked by advancements in understanding human behavior. However, this immediately raises the question of how we can truly know that progress has occurred or is being made. Possible indicators may include the development of theories that better explain observations, improvements in diagnostic tools and therapeutic interventions that help people more, and an increased ability to predict outcomes. In this way, the ability to predict human behavior means that psychology researchers have similar aims to scientific researchers, where prediction is a key measure of progress. Furthermore, progress may be seen when research influences political policy and then positively impacts people’s lives, demonstrating real-world applicability and improvement in human well-being. However, this raises questions about on whose values the notions of “improvement” and “progress” can be made and to what extent it is desirable for there to be a definitive understanding of these notions that are applicable to everyone.

Question: *If two competing paradigms give different explanations of a phenomenon, how can we decide which explanation to accept?*

Paradigms are frameworks of understanding that include a set of ideas about how a phenomenon works. They shape how problems are understood and addressed, determining what is studied, how research is conducted and how interpretations are made in academic settings such as psychology. When two competing paradigms in psychology offer different explanations for a phenomenon, the decision about which to accept and which to reject can be guided by evaluating the empirical evidence supporting each paradigm. Comparing the consistency, predictive power and replicability of findings across diverse settings and populations may help to determine

which paradigm is more valid. The paradigm that provides a more comprehensive understanding, integrates well with existing knowledge and effectively addresses previous anomalies could be considered more robust and is more likely to be accepted by the academic community. However, this still does not mean that one paradigm may be more correct than the other. For instance, the assumptions underlying the use of medical interventions such as SSRIs for treating depression differ from those of CBT. Medical interventions typically focus on the biochemical aspects of depression, suggesting that imbalances in brain chemistry can be corrected with medication. In contrast, CBT is based on the premise that depression is influenced by negative thought patterns and behaviors that can be altered through targeted cognitive and behavioral strategies. Both paradigms are supported by empirical evidence and are effective in treating depression, which highlights that multiple assumptions may provide complementary insights into the same condition.

Question: What role do models play in the acquisition of knowledge in psychology?

In psychology, models are theoretical frameworks or representations that simplify and organize understanding of complex mental processes, behaviors or phenomena. These models provide structured ways to interpret observations, predict behaviors and guide interventions.

Models in psychology can help understanding by offering clear, simplified explanations of complex behaviors and mental states, facilitating predictions and guiding effective treatments. However, they can also hinder understanding if they become too rigid, oversimplifying the diversity of human experiences or failing to account for individual and cultural differences. This can lead to incomplete or biased interpretations of psychological phenomena.

Example

Memory models

Atkinson and Shiffrin (1968) created the multi-store model of memory (MSM), which describes memory as a sequential process involving three stages: sensory memory, short-term memory and long-term memory. Each stage is characterized by specific capacities, durations and functions. This model has significantly advanced understanding of how memory works by delineating clear stages through which information passes and is processed. It has also facilitated predictions about memory recall and influenced techniques for improving memory retention.

However, the MSM has also faced criticism for being too linear and simplistic. Critics argue that it does not adequately capture the complexity of memory processes, such as the intricacies of memory retrieval or the influence of emotions and motivations on memory. For instance, Tulving (1985) introduced the concepts of episodic and semantic memory to highlight different aspects of long-term memory that the MSM does not address. His work emphasizes the role of consciousness and the organization of memory beyond simple, linear storage systems. Moreover, the MSM overlooks the impact of emotion and cultural and individual differences on memory processing, potentially leading to a generalized view that might not be universally applicable. As a result, while the MSM has been foundational in the field of cognitive psychology, its limitations highlight the risks of adhering too strictly to a single model, underscoring the need for more nuanced and comprehensive approaches to fully understand the diverse nature of human memory.

Summary

In this chapter, you have learned about:

- TOK principles: TOK challenges the definitiveness of knowledge, encouraging skepticism and critical questioning about how knowledge is developed, communicated and consumed.
- TOK assessments: The TOK Exhibition and Essay encourage reflective thinking about the nature of knowledge, focusing on applying TOK concepts within different AOKs and exploring specific TOK prompts or questions.
- AOKs and themes: TOK distinguishes five AOKs and five optional themes to deepen understanding of knowledge dynamics. Each AOK is a dynamic field where it is assumed knowledge is constantly created and modified by human factors.
- The interconnection between psychology and TOK: Psychology exemplifies how knowledge creation is influenced by methodologies, subjectivity, cultural contexts and ethical considerations. It oscillates between human sciences and natural sciences, showcasing how knowledge is shaped and categorized, raising questions about certainty and truth.
- TOK key concepts: Concepts such as evidence, certainty, truth and interpretation underpin discussions in psychology, emphasizing the complexities of establishing and validating knowledge within the field. Moreover, these can also be interconnected with the six psychology key concepts that have been discussed in this section.
- Ethical and methodological considerations: The ethical use of power, the responsibility of researchers and the pursuit of objectivity are important considerations in psychological research, impacting study designs, outcomes and broader societal implications such as policy development and implementation. However, the use of reflexivity, whereby researchers allow their readers access to their own ways of thinking, shows how psychology can embrace subjectivity to increase understanding of sensitive and complex social phenomena.
- Impact of researcher bias: Researchers' inherent biases and perspectives influence both the research process and its outcomes. This means it is essential to maintain ethical standards and transparency, while also raising questions about how correctness can be determined in psychological research.
- Challenges in psychology research: The unpredictability of human behavior and the subjective nature of psychological phenomena pose significant challenges to applying traditional scientific methods effectively.

- acculturation** The process through which individuals from one culture come into contact with and adopt the behaviors, norms and values of another culture.
- acculturative stress** The stress associated with living in and adapting to a new culture.
- agency** The sense of autonomy that people feel over their actions and decisions. Their ability to carry out their decisions.
- agonist** A chemical that binds to a receptor and activates it to provoke a biological response.
- anchoring bias** A tendency to believe the first piece of information that we learn about something when we need to make a decision, and to use that as a reference point to decide the accuracy of later information.
- anecdotal data** Data that is informal from accounts that are not systematically collected. It lacks scientific rigor or empirical support.
- animal model** An animal that is used to research human behavior.
- antagonist** A chemical that binds to a receptor and blocks it to dampen a biological response (sometimes called a blocker).
- approach** Used interchangeably with perspective — a theoretical framework applied to understand human behavior.
- artifact** In the context of brain imaging, artifacts are unwanted errors in the images that can arise from movement, scanner malfunction or other external factors.
- bar graph** A visual representation of discrete data using separate rectangular bars to show the values of different categories or variables. The length or height of each bar is proportional to the quantity it represents.
- behavior** Observable action, in response to internal biological changes, cognitive processes and environmental factors. In DP Psychology, intelligence, memory, motivation, language, learning, empathy, relationships are accepted as examples of behavior.
- bidirectional ambiguity** When the direction of cause-and-effect between two variables is unclear. It is challenging to determine which variable influences the other or if there is a mutual interaction.
- box and whisker plot** Also known as a box plot. A statistical graph used to show the distribution of a dataset.
- brain imaging techniques** Methods used to visualize the structure, function, or biochemical processes of the brain. These techniques provide insight into how the brain works, helping in the diagnosis of neurological conditions, guiding treatment, and advancing research in brain function and cognition.
- case study** A detailed analysis over time of an area of interest (a case) to produce context-dependent knowledge. A case study could also be an in-depth study of an individual. For the purpose of DP Psychology, case studies are considered a research method and use other research methods, such as interviews and observations, to collect data.
- causation** The relationship between cause-and-effect, where one event or factor directly brings about another. It describes how changes in one variable result in changes in another.
- chemical messengers** Substances in the body that carry messages from one cell to another, enabling communication between cells and organs to regulate physiological processes and behavior. For example, hormones, neurotransmitters and pheromones.
- classical conditioning** The theory that a conditioned response is created when a subject develops an automatic association with a certain stimulus, e.g. having a fear of spiders because you have a parent who is afraid of spiders.
- cognitive behavioral therapy (CBT)** A talking therapy that encourages the subject to see the connection between unhelpful or distorted thoughts and the way they affect feelings and behavior.
- cognitive bias** A systematic pattern of deviation from norm or rationality in judgment.
- cognitive dissonance** When a person holds two or more contradictory beliefs and experiences psychological stress as a result.
- cognitive error** This could be an error in memory, attention or perception. Often suggested to be the result of a lack of information or the use of mental shortcuts (heuristics).
- cognitive load theory** A psychological theory that describes how the human brain processes and manages information, particularly when learning.
- cognitive model** Theoretical construct that attempts to simulate human thought processes.
- cognitive process** Any mental function involved in the acquisition, storage, interpretation, manipulation, transformation and use of knowledge. Examples of these processes include attention, learning, memory, perception, thinking and decision making.
- compliance** When an individual modifies their behavior in response to a direct request from another person.

concept Organizing ideas with distinct attributes that are shared across multiple areas. In DP Psychology, the concepts are bias, causality, change, measurement, perspective and responsibility.

conceptual understanding A comprehension of the underlying principles and connections of a theory, model or idea, beyond mere memorization.

confirmation bias The tendency to seek, interpret and remember information that confirms pre-existing beliefs while ignoring or downplaying contradictory evidence.

conformity The psychological phenomenon where individuals adjust their attitudes, beliefs or behaviors to align with the norms or standards of a group.

conjunction fallacy A logical fallacy that occurs when people assume that specific conditions are more probable than a single general one. It happens when someone mistakenly believes that the probability of two events occurring together (in conjunction) is higher than the probability of either one occurring alone.

construct An abstract idea, concept or variable that cannot be directly observed but is used to explain or measure aspects of human behavior. Examples include intelligence and self-esteem.

construct validity Refers to the extent to which a test or measurement tool accurately measures the theoretical construct or concept it is intended to measure.

content analysis A data analysis method of examining, organizing and interpreting the content of numerical, written, visual or verbal material, such as data sets, texts or interviews, to identify key themes that can provide insights into human behavior. It can be used in both quantitative and qualitative research.

content validity The overarching assessment of how well a test or tool measures the construct it claims to measure.

context Circumstances, events and settings that give relevance to learning and information. In DP Psychology the contexts are health and wellness, human development, human relationships, and learning and cognition.

controlled observation A method in which researchers closely monitor and record specific behaviors in a controlled environment, such as a laboratory or a classroom, to gather data.

correlation A method of measuring the relationship between two variables that may move in the same direction (positive correlation) or move in opposite directions (negative correlation).

correlation coefficient A numerical value that represents the strength and direction of the relationship (correlation) between two variables. It ranges from -1 (perfect negative correlation) to 1 (perfect positive correlation).

correlational research A type of study investigating relationships between variables without any control over the setting; a focus on two variables.

correlational studies See correlational research.

cost-benefit analysis An evaluation of the positive and negative consequences of a decision by comparing the costs involved with the rewards it offers. In psychology it is often applied to the benefits of the knowledge generated compared with the cost to the participant.

covert observation Observing participants without their knowledge, to avoid participant expectations altering their behavior.

credibility The degree to which the research gives a true picture of what is being investigated and the results represent the perceptions and opinions of the research participants. Credibility is a factor in establishing trustworthiness in qualitative research.

critical periods Periods of time during which a person is especially sensitive to environmental stimuli or experiences.

critical thinking Analyzing, evaluating and synthesizing information and arguments to make reasoned and informed judgments or decisions.

cross-sectional research design A type of study that collects data from participants at a single point in time. It is often used to compare different groups of people or variables at a specific moment, providing a snapshot of their behavior.

culture The shared beliefs, values, norms and behaviors of a group of people. It plays a significant role, through enculturation, in shaping individual and collective identity and behavior.

cultural bias The tendency to interpret people's behavior based on one's own cultural norms and values. It can lead to misunderstandings and unfair judgments when assessing individuals from different cultures.

cultural competence The ability to interact effectively and sensitively with individuals from diverse cultures. It involves understanding and respecting cultural differences and adapting communication and practices to be inclusive and culturally sensitive.

- deductive research methodology** A method where researchers start with a general theory or hypothesis and then collect data to test or confirm that hypothesis. It involves moving from a general idea to specific conclusions.
- dependent variable** The variable in an experiment that is observed and measured to assess the effect of changes made to the independent variable. It is called “dependent” because its outcome depends on the manipulation of the independent variable.
- descriptive statistics** These are used to calculate and describe spread of data and measures of central tendency.
- determinism** The argument that events, including human actions and choices, are predetermined and inevitable. In psychology, the term is used in relation to biology or environment and implies little or no personal choice in human behavior.
- diathesis-stress model** A psychological theory that attempts to explain a disorder as the result of an interaction between a predispositional vulnerability (known as the diathesis) and stress caused by life experiences.
- digital technology** Electronic technology that generates, stores and processes data (for example, smart phones and computers).
- double-blind design** When neither the participants nor the researchers conducting the study are aware who is in the control group and who is in the experimental group. This is done to minimize bias and increase the reliability of results.
- drug misuse** The inappropriate or harmful use of medications or substances, which may include exceeding recommended doses, or using drugs for non-medical purposes.
- emic perspective/approach** This involves research that studies a culture or group from within, focusing on its unique beliefs, values and norms. It seeks to understand phenomena from the perspective of the individuals within that culture.
- empirical data** Data collected through systematic and objective methods. Information or evidence that is based on direct observation or experience rather than purely theoretical or abstract concepts.
- empirical evidence** Information and data obtained through observation, experimentation or direct experience. It is verifiable and can be measured or tested to support or disprove a hypothesis.
- enculturation** The process of learning and adopting the cultural norms, values and behaviors of one’s own culture, typically through socialization and upbringing.
- epigenetics** The study of how gene expression changes without altering the DNA sequence. These changes can be caused by a person’s age or exposure to environmental factors, such as diet, exercise, drugs and chemicals.
- ethical considerations** Considerations that are vital in any psychology investigation; they concern the ethics of treating participants fairly and without causing harm.
- etic perspective/approach** Research that studies cultures or groups from an outsider’s perspective, often using universal criteria that apply across cultures. It aims to identify common behaviors and make comparisons.
- experimental controls** Measures put in place during research to minimize the influence of extraneous variables that could affect the results. These controls help ensure that changes in the dependent variable are due to the manipulation of the independent variable.
- external validity** The degree to which a study’s findings can be applied to other people, situations, settings and measures. It’s a measure of how well the results of a study can be generalized to a broader context.
- extraneous variable** Variables other than the independent variable in an experiment that can potentially influence the dependent variable. If not controlled, they can become confounding variables.
- focus group** A research method involving a small group discussion led by a facilitator to gather diverse opinions and insights on a particular topic.
- frequency table** A data presentation method that displays the number of times each value or category appears in a data set.
- genetic inheritance** Genetic inheritance refers to the passing of traits and characteristics information from one generation to the next through the transmission of genes from parents to offspring. It plays a crucial role in the development of traits and behaviors in individuals.
- generalizability** The extent to which research findings or conclusions drawn from a study can be applied to a different population or other settings. It demonstrates the external validity of research.
- glial cells** Provide support and protection for neurons. They play a variety of roles, including maintaining homeostasis, forming myelin, providing support and nutrients, and participating in signal transmission in the nervous system.
- graph** A visual representation of data, often used in psychology to illustrate patterns, trends or relationships between variables. Common types include bar graphs, box and whisker plots and scatter plots. Also sometimes called a chart.

histogram A visual representation of continuous data that uses touching rectangular bars to illustrate a frequency distribution—how often each value occurs in a data set. The length or height of each bar is proportional to the quantity it represents and the shape of the histogram shows the distribution of the data.

holism An approach in psychology that emphasizes the idea that human behavior should be viewed as a whole integrated experience, and not as separate parts. (Opposite of reductionism.)

identification The merging of an individual's sense of self and their group's identity.

identity formation The process of developing a unique personality or a clear sense of self.

independent measures A research design in which different groups of participants are assigned to each condition of the experiment, allowing for comparisons between groups to assess the effects of the independent variable.

independent variable The variable that the researcher manipulates (for example, the quantity of caffeine) to observe its effects on the dependent variable (the memory performance). The independent variable is the cause in the cause-and-effect relationship.

Indigenous psychologies Indigenous psychologies are distinct from mainstream Western psychology. They refer to the diverse and culturally relevant ways of understanding and studying human behavior and cognitive processes within specific Indigenous communities. These psychologies are rooted in the cultural, historical and social contexts of these communities and often incorporate traditional beliefs, practices and worldviews.

Indigenous societies Communities who are native to a particular region or land and have a unique cultural, historical and often ancestral connection to that place. They are distinct from the dominant cultures that may have colonized or influenced the region.

inductive research methodology An approach in which researchers start with specific observations or data and use them to develop broader theories or general principles. It involves moving from specific instances to generalizations. An example is grounded theory, where the theory is developed from ("grounded in") the data, rather than the other way around.

ingroup The people you identify with as being similar to you, or having interests or values in common.

innate Describes qualities, characteristics or abilities that are present in an organism from birth or are inherent to its nature, rather than being learned or acquired through experience.

internal validity The extent to which observed effects within a study can be attributed to changes in the independent variable rather than any additional variables.

interpersonal communication The exchange of information between two or more people using direct or indirect methods.

interpretive approach Understanding of human behavior through subjective analysis and context. It emphasizes the role of personal meaning and cultural context in understanding behavior.

Likert-type scales A rating scale used to measure opinions, attitudes or behaviors.

line graph A straight or curved line used to depict where data points lie on a chart.

localization The notion that specific areas of the brain are responsible for specific behaviors.

longitudinal design A research design in which data is collected from the same individuals or groups over an extended period, in order to study changes or developments over time.

maturation The natural process of individual growth and development over time, leading to changes in physical, cognitive and emotional abilities.

model A theoretical representation or framework used to explain and understand complex processes in order to test hypotheses and make predictions.

motivation The impetus that gives purpose or direction to behavior and operates in humans at a conscious or unconscious level.

mundane realism The degree to which a research study or experimental setting resembles real-life situations and experiences. It impacts the external validity of findings.

naturalistic observation Observing and recording behavior in a natural setting (such as on the street or in a supermarket) without researcher interference, to study behavior as it occurs naturally.

neural pruning When excess or unnecessary neurons and synapses are removed to streamline neural networks.

neurogenesis A stage of prenatal development during which neurons are created from neural stem cells.

neuroplasticity The brain's ability to form and reorganize synaptic connections.

- neurotransmission** The transfer of an impulse or information from one nerve fiber to another fiber or structure by diffusing across the synapse.
- neurotransmitters** Chemical messengers that carry messages across synapses between nerve cells, muscles and glands.
- non-participant observation** Observing a group or situation without actively participating, maintaining a more objective “outsider” view.
- one-tailed (or directional) hypothesis** A hypothesis that predicts the direction of the relationship between two variables, usually based on the results of previous studies.
- operant conditioning** Part of the cognitive approach, a concept that aims to explain how individuals are affected by rewards and penalties.
- operationalization** Stating exactly how a variable will be manipulated or measured in experimental research.
- opportunity sampling** A non-random sampling technique in which participants are selected because they are easily accessible to the researchers.
- outgroup** The individuals not regarded as being within an ingroup, as they are seen as having different beliefs or values.
- overt observation** Observing participants openly, so they are aware of being watched.
- participant bias** Occurs when participants in a study alter their behavior or responses due to their awareness of being observed or their expectations about the study’s purpose.
- participant observation** Researchers immerse themselves in the activities of the group being studied, participating in them to gain a deeper understanding of the group’s behavior.
- placebo** A treatment that has no therapeutic effect but is given to participants in a research study. It helps researchers assess the effects of an active treatment by comparing it to the non-active placebo.
- positivism** Emphasizes the use of empirical evidence and scientific methods to gain knowledge and understand the human behavior. It contrasts with more interpretive or qualitative approaches in psychology.
- prevalence** The proportion or percentage of a population that shows a particular condition or trait at a specific point in time or over a lifetime. It is commonly used in health and wellness research.
- prospective research** Research that follows individuals or groups over time, collecting data periodically. Used to investigate the outcomes of specific events or conditions.
- psychological literacy** The understanding of psychology and application of problem-solving skills and psychological principles to real-life problems in different contexts. Includes acting ethically, thinking critically, cultural competence and self-awareness.
- publication bias** When the results of research are selectively published based on the direction or significance of their findings. It can lead to a partial and biased representation of the research literature, as studies with positive or statistically significant results are more likely to be published.
- qualitative research** The collection and analysis of textual or verbal data to understand and explore the meaning behind people’s behavior. Methods such as interviews, observations and content analysis are used to investigate the experiences and meanings that individuals attribute to them.
- quantitative research** The collection and analysis of numerical data to examine relationships between variables. It relies on statistical techniques to test hypotheses and make inferences about populations based on data.
- quasi-experiment** A research method that resembles a true experiment but lacks random assignment of participants to different groups. In a true experiment, researchers randomly assign participants to different conditions. In a quasi-experiment, researchers often have limited control over participant assignment, meaning it is unable to establish a cause-and-effect relationship.
- random sampling** A selection process in which each member of the target population has an equal probability of being selected for the study.
- recall bias** Refers to systematic difference in the ability of participant groups to accurately recall information. Observational studies that rely on self-reporting of past behaviors or events are particularly prone to this type of bias.
- reciprocal determinism** The idea that people both affect and are affected by their environment, suggesting a dynamic interaction between a person’s behavior, their cognitive processes and the environment.
- reductionism** An approach in psychology that seeks to understand complex phenomena by breaking them down into simpler, more manageable components or elements. (Opposite of holism.)

- reflexivity** The researcher's awareness of their own perspectives, biases and values and how these may influence the research process and findings. It involves ongoing critical self-reflection during the research process. Epistemological reflexivity involves reflecting on the process and methodology used to try to gain understanding. Personal reflexivity involves the researcher reflecting on their own biases and values that may affect the findings and conclusions drawn.
- reliability** The consistency of measurement tools or methods. A reliable measure or assessment should yield consistent results when administered repeatedly under similar conditions and with a similar population.
- repeated measures design** A research design in which the same group of participants is measured or tested more than once under different conditions. This design allows for the examination of changes within the same individuals.
- research method** The specific techniques or procedures used to collect data for a research study. Examples include surveys/questionnaires, case studies, experiments, interviews and observations.
- research methodology** The broader framework and philosophical approach that guides the entire research process. It includes the choice of research methods, sampling techniques, data collection, analysis techniques and the overall strategy for conducting research.
- researcher bias** When a researcher's personal values or expectations influence the design, data collection or interpretation of findings, potentially leading to biased results.
- response validation** Checking with participants, or a subset of participants, that the meaning they intended to convey is what was captured by the researcher.
- retrospective research** This involves the examination of past events, data or records to understand and analyze behavior that has already occurred. It relies on historical data and participants' memories.
- sampling bias** This occurs when the sample used in a research study is not representative of the population from which it was drawn and to which the findings may be generalized.
- schema** Mental representations that organize knowledge, beliefs and expectations.
- schema theory** Proposes that cognitive frameworks known as schemas help to organize and interpret information.
- self-awareness** The ability to recognize oneself as being distinct and different from others and to be able to think about one's own existence.
- self-concept** The understanding and perception of oneself, including one's own physical characteristics, capabilities, attitudes and opinions.
- self-construal** Self-construals refer to how individuals define themselves in relation to others: as independent from others or as interdependent with others.
- self-esteem** The value one places on oneself and involves judgments about one's competence and worth.
- self-regulation** The ability to control one's own behavior, including emotions and thoughts, to achieve long-term goals.
- self-reported data** Data collected directly from individuals through their own accounts, typically through surveys, questionnaires or interviews.
- self-selected sampling** A method characterized by individuals choosing to participate in a study, often in response to advertisements or invitations.
- semi-structured interview** An interview approach combining open-ended and closed-ended questions, providing flexibility for in-depth exploration while maintaining some structure.
- skewness** The degree to which the distribution of data in a dataset is asymmetrical, as shown when graphed. A positively skewed distribution has a longer tail on the right side, while a negatively skewed distribution has a longer tail on the left side.
- snowball sampling** This method relies on the initial identification and recruitment of a small sample of participants who belong to the target group of interest. Initial participants assist in the recruitment of further participants from their social networks or connections.
- social-desirability bias** When participants in research respond in ways they believe are socially acceptable or favorable rather than truthfully.
- social identity theory (SIT)** This theory suggests that people define themselves in relation to social groups.
- social learning theory (SLT)** Proposes that behavior is modelled by other members of a social group and acquired through observation or imitation based on consequences of a behavior.
- statistical significance** Statistical significance in research indicates that the results of a statistical test are unlikely to have occurred by chance. It is represented by a level of probability, usually $p < 0.05$ in psychology, meaning there is an equal to or less than a 5% probability that the results occurred by chance.

- stereotyping** The creation of a standardized image that is held in common by members of a group and that represents an oversimplified opinion, prejudiced attitude, or uncritical judgment of another group of people.
- stigma** Refers to negative beliefs about and attitudes towards individuals or groups based on certain characteristics, such as mental disorders or social identity.
- stratified sampling** A method of sampling where random samples are drawn from subgroups of the population.
- structured interview** A research method that involves asking all participants a standardized set of questions in a specific order, ensuring consistency across interviews.
- survey/questionnaire** A set of questions used to obtain information from a respondent about a topic of interest, such as attitudes, behaviors, personality or values. A survey or questionnaire may be administered with pen and paper, in a face-to-face interview or online. For the purposes of DP Psychology, the two terms are interchangeable.
- synthesis** The process of combining different pieces of information or ideas to create a new, integrated understanding. It involves taking separate elements and merging them into a coherent whole, often to generate new insights or theories.
- systems-oriented approach** To consider behavior and experience as complex and interrelated systems.
- t-chart** A two-column table used to organize information, particularly when comparing or contrasting two different sets of data.
- t-test** Shows how significant the differences between group means are.
- theory** A systematic and organized set of principles or ideas that explain and predict behavior or phenomena. Theories are used to understand and make sense of various psychological phenomena and are often tested through research to evaluate their validity.
- thematic analysis** A qualitative research method that involves systematically identifying, analyzing and interpreting recurring patterns within data such as interviews, surveys or texts. It aims to uncover the underlying meanings and a deeper understanding of the participants.
- third-culture kids** Young people who find themselves living in a different culture to their parents' culture.
- transferability** Term used in qualitative research to mean the extent to which findings from a study can be applied or generalized to other contexts or settings beyond the specific study's participants or conditions. It assesses the applicability of research findings to different situations.
- transfer skills** The ability to apply knowledge and understanding gained in one situation or context to another, unfamiliar situation.
- triangulation** Using several types of measurement to improve the credibility of research.
- true experiment** A controlled experiment where researchers manipulate an independent variable to observe its impact on a dependent variable, using random allocation of participants to conditions to ensure causation.
- two-tailed (or non-directional) hypothesis** A hypothesis which predicts that there will be a relationship between two variables but where there is uncertainty about what the relationship is (usually if there is contradicting evidence from previous studies).
- type I error** Also known as a false positive, this occurs in hypothesis testing when a null hypothesis that is actually true is rejected. Therefore, it represents the conclusion that there is a significant effect or relationship when there is not.
- type II error** Also known as a false negative, this occurs when a null hypothesis that is actually false is not rejected. It represents the conclusion that there is no significant effect or relationship when there is one.
- unstructured interview** A qualitative research method where one or two open-ended questions are used to start a conversational interview. This allows participants to express themselves freely and it is often used to explore personal experiences and perspectives.
- validity** Internal validity—the extent that a measurement conducted within a study accurately measures or assesses what it claims to measure. External validity—the extent to which findings from a study can be generalized to a different setting or population.
- variable** Any factor or characteristic that can vary and is subject to measurement or manipulation in research. Variables are used to investigate and describe various aspects of human behavior. Usually identified most clearly in experiments as independent variables (manipulated), dependent variables (measured) and controlled variables (held stable).
- wait-listing** Any factor or characteristic that can vary and is subject to measurement or manipulation in research. Variables are used to investigate and describe various aspects of human behavior. Usually identified most clearly in experiments as independent variables (manipulated), dependent variables (measured) and controlled variables (held stable).

Concepts

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Content

Biological approach

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