

Introduction

The Science of Psychology

Psychology: the scientific study of behaviour (actions that can be observed) and the mind (internal processes such as thoughts and feelings).

Science: a process that involves systematically gathering and evaluating evidence to answer questions and test beliefs.

Understanding behaviour: some pitfalls of everyday approaches

Mental shortcuts: When forming judgements, we sometimes take “mental shortcuts”, e.g. judging someone’s personality based solely on stereotypes about his or her physical appearance.

Fail to consider alternative explanations: Many factors may influence behaviour, but we may “fail to consider alternate explanations” for a behaviour and assume that one factor has caused it when some less obvious factor was the major cause.

Confirmation bias: Selectively paying attention to information that is consistent with our beliefs and downplaying or ignoring information that is inconsistent with them. Once our beliefs are established, we often fail to test them further.

Goals of psychology

1. Describe – how people behave, think and feel
2. Explain – to understand the reason people act the way they do
3. Control – by designing experiments or conducting research to test proposed explanations
4. Apply – knowledge to enhance human welfare

Levels of Analysis

There are many factors to understand the reasons people behave, think and feel the way they do. To simplify things there is a framework to help examine behaviour and causes called levels of analysis.

1. Biological level – brain processes and genetic influences
2. Psychological level – thoughts, feelings and motives
3. Social level – past and current physical and social environments we are exposed to

Mind-body interactions: refers to the relationship between mental processes in the brain and functioning of the physical body; interaction between the psychological and biological levels of analysis.

Perspectives on Behaviour

Perspectives: different ways of viewing people or lenses used to examine and interpret behaviour, which has become part of psychology’s traditions.

Mind-body dualism: the belief that the mind is a spiritual entity not subject to physical laws that govern the body.

Monism: from the Greek word monos, meaning ‘one’ is the belief that the mind and body are one and the mind is not a separate spiritual entity, so mental events in the brain correspond to physical events. Monism helped set the stage for psychology because it implied that the mind could be studied by measuring physical processes within the brain.

Structuralism: the analysis of the mind in terms of its basic elements of consciousness. The start of studying cognitive processes.

Functionalism: study of the functions of consciousness rather than its elements, i.e. exploring the purposes of consciousness.

1. The psychodynamic perspective

Emphasises the role of unconscious processes of our personality, focusing on early relationships and how they shape people's views. Conscious vs unconscious motivations.

Free association: a technique used by Freud where the patient expressed any thoughts that came to mind.

Psychoanalysis: a form of psychotherapy developed by Freud, analysing internal and unconscious psychological forces.

Defence mechanisms: Freud described as psychological techniques that help us cope with anxiety and the pain of traumatic experiences.

Repression: a primary defence mechanism, protects us by keeping unacceptable impulses, feelings and memories in the unconscious depths of the mind.

2. The behavioural perspective

Focuses on the role of the external environment in governing our actions. From this perspective, our behaviour is determined by habits learned from previous life experiences and by our immediate environment. Role of rewards and punishments for motivation.

Stems from the philosophy of British empiricism. Early empiricist John Locke believed, at birth the human mind is a blank slate upon which experiences are written. In this view, human nature is shaped purely by the environment.

Behaviourism: a philosophy emphasising that learning occurs through our environment.

Cognitive behaviourism: proposes that learning experiences and the environment influence our expectations and other thoughts and, in turn, that our thoughts influence how we behave.

3. The humanistic perspective (humanism)

Emphasises free will, personal choice, growth, responsibility for turning things around and the attempt to find meaning in life. Motivations to reach our full potential.

Self-actualisation: reaching individual potential.

Positive Psychology: movement emphasises the study of human strengths, fulfilment and optimal living. Rather than focusing on 'what's wrong with our world' (e.g. mental disorders, conflict, prejudice), positive psychology examines how we can nurture what is best within ourselves and society to create a happy and fulfilling life.

4. The cognitive perspective

Examines the nature of the mind and how mental processes influence behaviour. In this view, actions are governed by our thought. Role of beliefs, expectations, outcomes and abilities.

Two of psychology's early philosophies, structuralism and functionalism, reflected the cognitive perspective.

5. The sociocultural perspective

Examines how the presence of other people influences our behaviour, thoughts and feelings.

Culture: refers to the enduring values, beliefs, behaviours and traditions that are shared by a large group of people and passed from one generation to the next.

Social norms: rules (often unwritten) that specify what behaviour is acceptable and expected for members of that group.

Socialisation: the process by which culture is transmitted to new members and internalised by them.

Individualism: a culture that has emphasis on personal goals and self-identity based primarily on individual attributes and achievements.

Collectivism: a culture where individual goals are not as important as those of the group. Personal identity is defined mostly by the ties to the extended family and other social groups.

According to one theory, people in individualistic cultures are more likely to view romantic love as a requirement for marriage because love is a matter of personal choice. In collectivistic cultures, concern for the extended family plays a larger role in marriage decisions.

6. The biological perspective

Examines how brain processes and other bodily functions regulate behaviour.

Neurotransmitters: chemicals released by nerve cells that allow them to communicate with one another.

Evolutionary psychology: seeks to explain how evolution shaped modern human behaviour.

Biological adaptations to maximise survival and reproduction.

Research Methods

Steps in the scientific process

1. Identify a question of interest
2. Gather information and form a hypothesis
3. Test the hypothesis by conducting research
4. Analyse data, draw tentative conclusions, and report findings
5. Build a body of knowledge, ask further questions, form and test new hypotheses and build theories.

Theory: a set of formal statements explaining how and why certain events are related. Theories are broader than hypotheses. Scientists use theories to formulate new hypotheses, which are then tested by conducting more research.

Defining and measuring variables

Variable: Any characteristic or factor that can vary

Operational definition: A variable (e.g. depression) in terms of specific procedures (e.g. Brexit depression test) used to measure it. . Operational definitions translate abstract concepts into something observable and measurable.

Measuring tools:

1. Self-report measures – ask people to report on their own knowledge, attitudes, feelings, experiences, etc. Information gathered through interviews and questionnaires.
2. Psychological measures – e.g. personality, intelligence or neuropsychological tests (measuring performance of mental and physical tasks)
3. Behavioural measures – directly observable behaviour, archival measures (records or documents that already exist)
4. Physiological measures – e.g. heart rate, blood pressure, respiration rate, etc.

Coding systems: Psychologists develop coding systems to record different categories of behaviour, e.g. a parent and child perform a task together, we may code the parent's behaviour into categories such as 'praises child', 'assists child', etc.

Ethical Standards

- Principles of ethical conduct
- Merit – Has potential benefit or contributes to knowledge
- Integrity – Done honestly and open
- Justice – Participants treated fairly
- Beneficence – Benefits outweigh any risk, harm or discomfort
- Respect – Maintain person's privacy and capacity to give informed consent

The principle of informed consent: involves participants being fully informed of the research project including who is participating, purpose and procedure, etc. and emphasises the importance of weighing potential risks with benefits.

Deception: when participants are misled about the nature of a study, which goes against informed consent, but when studying certain types of behaviours, deception is the only way to get a natural response. When deception is used the true purpose of the study should be explained after it is over.

Methods of Research

1. Case study – A study of a single case in detail (Advantages: 1. When rare cases occur, can study closely 2. May challenge a theory or widely held belief 3. Source of new ideas)
2. Naturalistic observation – Observe behaviour in natural setting
3. Surveys – Questionnaires or interviews
4. Correlational study – Looking for relationships and patterns

Population: all the individuals we are interested in drawing a conclusion about.

Sample: a subset of individuals drawn from the larger population

Random sampling: when every member of the population has an equal probability of being chosen to participate in the survey.

Social desirability bias: tendency to respond in a socially acceptable way rather than according to how one truly feels and behaves – problem with self-reports, such as surveys.

Correlational research

Correlation shows how strongly pairs of variables are related, e.g. height and weight are related (taller people tend to be heavier than shorter people)

Correlation coefficient: A statistic that indicates the direction and strength of the relation between two variables. The main result of a correlation is called the correlation coefficient or “r” and ranges from -1.0 to +1.0. The closer “r” is to +1 or -1 the more closely the two variables are related. If “r” is close to 0, it means there is no relationship between the variables.

Positive correlation: Higher scores on one variable are associated with higher scores on a second variable. For example, social relationships and happiness are positively correlated because more satisfying relationships are associated with higher levels of happiness. If “r” is positive (above 0 to +1), it means that as one variable gets larger the other also gets larger.

Negative correlation: Higher scores on one variable are associated with lower scores on a second variable. For example, job satisfaction and job turnover are negatively correlated because workers who are satisfied with their jobs tend to have lower rates of turnover such as quitting or being sacked. If “r” is negative (below 0 to -1), it means that as one variable gets larger the other one gets smaller.

Remember: Correlation does not imply causation.

Identifying variables

Independent variable: Factor that is manipulated or controlled by experimenter.

Dependant variable: Factor that is measured by experimenter and may be influenced by independent variable.

Example: Experiment to examine how talking on a mobile phone affects braking reaction time.

Independent variable = Phone (factor that is changed)

Dependant variable = Braking reaction time (factor being measured)

Experimental group: group that receives a treatment or independent variable.

Control group: group not exposed to treatment or no independent variable.

Threats to Validity

Internal validity: Ability to draw conclusions about causal relationships from data. A study has high internal validity when clear conclusions can be made that one variable caused changes to another variable.

Threats to internal validity

- Confounding variables – two variables intertwined in such a way that we cannot determine which one has influenced the dependent variable, e.g. a therapist or the therapy used
- Placebo effects – people receiving a treatment show a positive change in behaviour because of their expectations, not because the treatment itself had any specific benefit
- Experimenter expectancy effects – subtle and unintentional ways a researcher influences participants to respond in a way that is consistent with their hypothesis
- Replicating and generalised finding – degree to which a study can be replicated and generalised to other populations, settings and conditions

Sensation and Perception

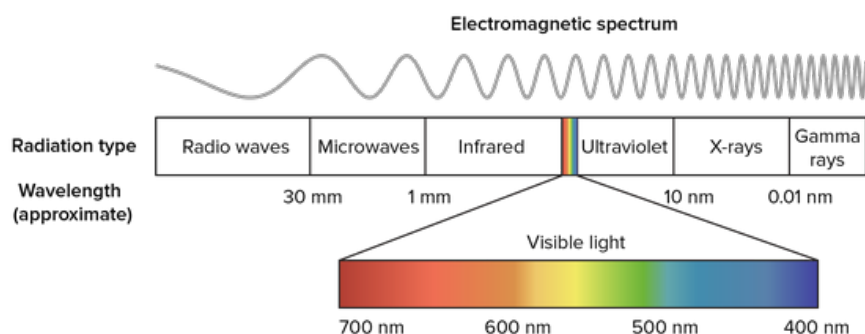
Sensation: Transduction - The process of our sense organs responding and translating environmental stimuli into nerve impulses that are sent to the brain

Perception: Process of organising this stimulus input and giving it meaning

Sensory adaptation: Diminishing sensitivity to an unchanging stimulus, e.g. people working on a building site not reacting when they hear a nail gun go off.

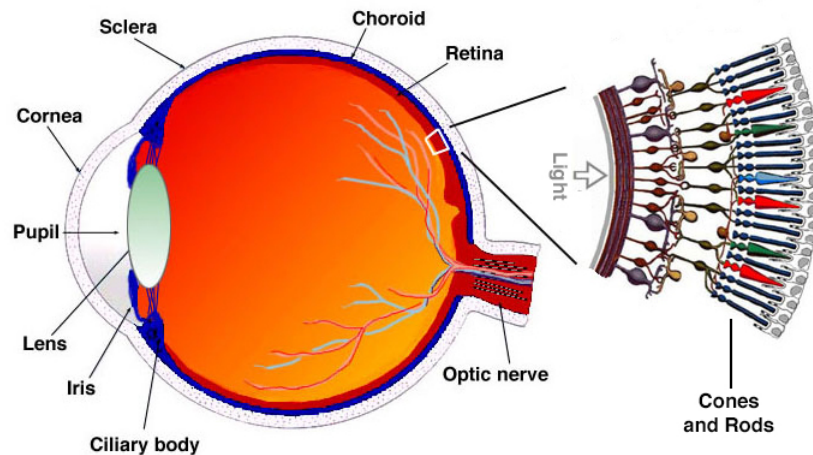
Light and vision

Vision occurs through electromagnetic energy (light waves), which are measured in nanometres (one billionth of a metre). In addition to the tiny portion of light waves visible to humans, the electromagnetic spectrum includes radio signals, television, microwaves, infrared, x-rays and ultraviolet (energy produced by the sun). Within the window of light that is visible each colour has a different energy length, lowest being red and highest being violet.



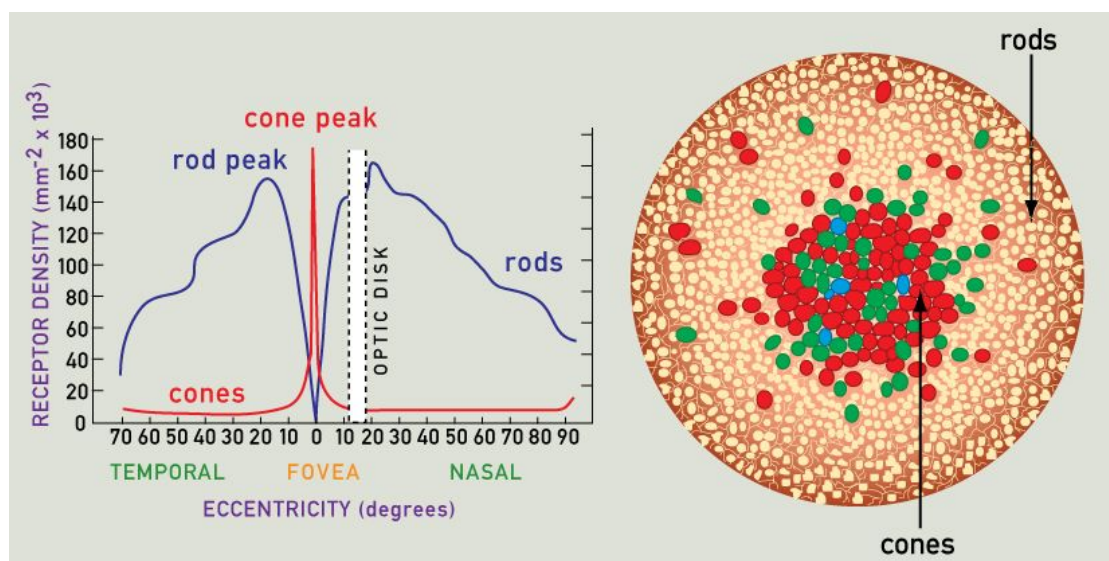
The Human Eye

Light waves enter the eye through the cornea, a transparent protective structure at the front of the eye. Behind the cornea is the pupil, an adjustable opening that can dilate or constrict to control the amount of light that enters. Low light causes the pupil to dilate, letting more light into the eye and bright light makes the pupil constrict. The size of the pupil is controlled by muscles in the iris that surrounds the pupil. Behind the pupil is the lens, an elastic structure that becomes thinner to focus on distant objects and thicker to focus on nearby objects, similar to the lens on a camera. The lens focuses the visual image on the retina, a multilayered light-sensitive tissue at the rear of the fluid-filled eyeball, similar to photosensitive material such as film.



Photoreceptors: the rods and cones

The retina, with specialised sensory neurons is actually an extension of the brain. It has two types of light-sensitive receptor cells called rods and cones because of their shapes. Rods are useful in very low light levels, but do not provide information on colour. Cones function best in bright light levels and when there is more than one type, they generate a perception of colour. In human's rods are found throughout the retina except in the fovea, a small area in the centre of the retina that has no rods but many densely packed cones, providing the highest visual resolution. Cones decrease in concentration further away from the centre of the retina and the periphery of the retina contains mainly rods.



Visual acuity: ability to see fine details when the visual image projects directly onto the fovea.

Optic disk: A gap not far from the fovea where all nerve fibres come together and leave the back of the eye to go to the brain, where there are no photo receptors, creating a blind spot. We are not aware of this gap because our perceptual system fills in the missing information.

Optic nerve: A bundle of cells at the back of the eye, converting the information of rods and cones to the brain.

Photopigments: The action of rods and cones translating light waves into nerve impulses, for the brain to understand.

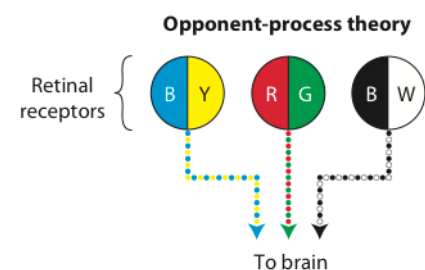
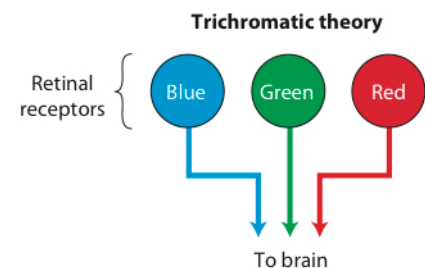
Dark adaptation: The progressive improvement in sensitivity that occurs over time under conditions of low light.

Colour vision

Our threshold for light wavelengths are so small that we are able to distinguish an estimated 7.5 million hue various. Historically there are two theories of colour vision that have tried to explain how this occurs.

1. The trichromatic theory

Isaac Newton observed that there is a distinction between the physical properties of light and the resulting colour we perceive, specifically that adding different colours together can generate other colours. By 1800 it had been established that any colour can be produced by some combination of the wavelengths that correspond to the colours red, green and blue. The trichromatic (three-colour) theory of colour vision was advanced by Thomas Young (English physicist) and Herman von Helmholtz (German physiologist). According to the Young-Helmholtz trichromatic theory, there are three types of colour receptors in the retina, which send messages to the brain to create the colours we perceive. Although all cones can be stimulated by most wavelengths to varying degrees, individual cones are most sensitive to wavelengths that correspond to blue, green or red.



2. Opponent-process theory

The opponent-process theory formulated by Edward Hering in 1870 also assumed that there are three types of cones. It was proposed that each of the three cone types respond to two different wavelengths. One type responds to blue or yellow, another to red or green and a third to black or white. For example, a red-green cone responds with a certain reaction to a green stimulus and a different reaction (opponent process) to a red stimulus.

3. Dual process theory

After two centuries of research, verifying evidence has been found for each theory. The dual-process theory combines both theories. The trichromatic theory was correct, the cones do contain one of three different protein photopigments (light sensitive molecules) that are most sensitive to wavelengths roughly corresponding to the colours blue, green and red. The opponent-process theory was also partly correct, but opponent processes do not occur at the level of the cones.

Colour-deficient vision

Trichromats: People with normal colour vision, i.e. sensitive to all three systems of blue-yellow, red-green and black-white.

Dichromat: A person who is colour blind in only one of the systems, i.e. blue-yellow or red-green

Monochromat: A person is totally colour blind and sensitive only to black-white system.

Perception

To create perceptions, the brain carries out two different types of processing.

Bottom-up processing: the brain takes in individual elements of a stimulus and then combines them into a unified perception.

Top-down processing: sensory information is interpreted in light of existing knowledge, concepts, ideas and expectations.

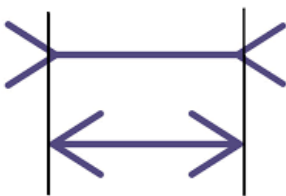
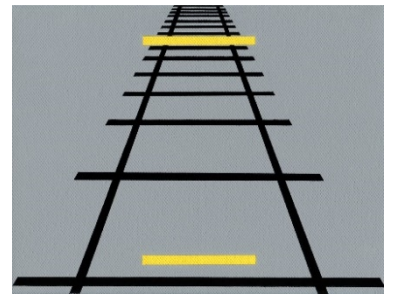
Attention

Attention is strongly affected by both the nature of the stimulus and by personal factors. Characteristics that attract our attention include intensity, novelty (new, original or unusual) movement, contrast and repetition. Sexually oriented stimuli are especially attention-grabbing and advertisers use this in their commercials and packaging. Internal factors such as our motives and interests also influence the stimuli in our environment we notice, e.g. a botanist walking through a park would be attentive to plants.

Illusions

Illusions are compelling, but incorrect perceptions.

The Ponzo illusion is a geometrical-optical illusion that was first demonstrated by the Italian psychologist Mario Ponzo in 1911. He suggested that the human mind judges an object's size based on its background. He showed this by drawing two identical lines across a pair of converging lines, similar to railway tracks. In this context, we interpret the upper line as though it were farther away, so we see it as longer because a farther object would have to be longer than a nearer one for both to produce images of the same size.



The Muller-Lyer Illusion: In this illusion the two lines are identical in length. The line ending in the inward arrow causes people to perceive that it is shorter because our eyes go out toward the point and then come back. The turning back of our eyes makes the line seem shorter. The line ending in the outward arrow causes people to perceive that it is longer because our eyes go out farther

Performance Psychology

Procrastination

Definition

1. Procrastination is the gap between intention and action
2. Procrastination is voluntary

Why we don't feel like it tomorrow

Affective Forecasting: People's prediction's about their affect (emotional state) in the future

1. Predictions about future emotional valence (degree of like or dislike toward something)
2. Specific emotions experienced
3. Duration of emotions
4. Intensity of emotions