Development and Learning

AP Psychology

Studying Development

Developmental psychology studies how people change across the lifespan. Ask how change happens, how stable a feature is, and how inherited characteristics interact with experience (**nature and nurture**).

- Is change **continuous** (gradual and smooth) or **discontinuous** (in stages)?
- Is a trait **stable** across life, or does it change?

Researchers answer these with two designs. A **cross-sectional study** compares different age groups at one time - fast, but differences may come from the groups' different generations. A **longitudinal study** follows the same people over years - slower, and can show change within people. A **cohort effect** is a difference linked to a generation's experiences rather than age alone. Longitudinal research can be affected by participant dropout and repeated testing; following people does not by itself prove what caused a change.

Physical Development

Development before birth can be disrupted by **teratogens** (harmful agents such as alcohol), maternal illness, genetic mutations, and hormonal or environmental factors.

Infant physical development often follows a similar general order, but timing varies. **Gross motor skills** use large muscle groups, as in walking; **fine motor skills** use smaller coordinated movements, as in grasping a pencil. Newborns show **reflexes** that provide evidence about development, such as the **rooting reflex** (turning towards a touch on the cheek). The **visual cliff** apparatus provides evidence about early depth perception. Avoidance of its apparent drop is not proof that fear of heights is entirely innate; experience and the task also matter.

A **critical period** is a limited window when particular input is necessary for typical development of a function; a **sensitive period** is a time of heightened responsiveness in which later learning can still occur. Some animals show **imprinting**, an early attachment-like following response during a limited developmental window. Do not equate it with every human attachment.

Adolescence brings the **adolescent growth spurt** and **puberty**, including **primary sex characteristics** (reproductive organs and their development) and **secondary sex characteristics** (such as voice changes and body hair). **Menarche** is the first menstrual period; **spermarche** refers to the first ejaculation. Adulthood spans most of life. Mobility, flexibility, reaction time and sensory acuity can change at different rates; decline is not identical for every person or ability. **Menopause** marks the end of menstrual cycling and reproductive change, not the end of learning or social development.

Gender and Sexual Orientation

Sex refers to biological characteristics, while **gender** includes social roles and expectations as well as identity. Sex, gender identity, gender roles and sexual orientation are distinct concepts. **Gender roles** are learned through **socialization**: family, school, peers, and media all teach what behaviour is expected. **Sexual orientation** describes a person's enduring pattern of attraction. For example, different encouragement from adults can shape opportunities to practise a skill. A group difference alone does not establish a biological cause. Do not infer a person's identity or orientation from clothing, toys or one behaviour.

Cognitive Development

Piaget's proposed stages: characteristic abilities

Sensorimotor	infancy to toddlerhood	object permanence
Preoperational	toddlerhood to early childhood	symbols, pretend play (still egocentric)
Concrete operational	early to late childhood	conservation, logical about concrete things
Formal operational	late childhood to adulthood	abstract and hypothetical reasoning

Broad age descriptions, not universal deadlines or a diagnosis from one task

Piaget's proposed sequence, with characteristic changes in reasoning

Piaget proposed that children build **schemas**, mental frameworks for organising experience. **Assimilation** fits new experience into an existing schema; **accommodation** changes the schema when it does not fit. His theory includes four stages; their broad age descriptions are not precise deadlines for every child:

- **Sensorimotor stage** (infancy to toddlerhood): the child learns through senses and action, and develops **object permanence** - knowing an object still exists when hidden.
- **Preoperational stage** (toddlerhood to early childhood): the child uses symbols and pretend play but shows **egocentrism** (difficulty tak-

ing another view) and has difficulty with **conservation** (quantity staying the same when shape changes) and **reversibility** (mentally reversing an action). **Animism** attributes life-like qualities to objects. **Theory of mind**, understanding that other people can have different beliefs and knowledge, begins developing during this period. Egocentrism describes difficulty taking another perspective, not simply selfishness.

- **Concrete operational stage** (early to late childhood): the child reasons logically about concrete things and gains conservation.
- **Formal operational stage** (late childhood onward): abstract and hypothetical reasoning becomes possible. Piaget did not propose that every person achieves it in all situations.

Vygotsky saw children as social learners. The **zone of proximal development** is the gap between what a child can do alone and what they can do with help; **scaffolding** is temporary, adjusted support that helps the learner perform a task and is reduced as independence grows. Piaget also recognised experience, and Vygotsky's account does not say solitary learning is impossible.

Adult cognition changes too, and here the fluid/crystallised split from Unit 2 returns: fluid reasoning tends to decline on average while crystallised knowledge is relatively stable through much of adulthood. Individual trajectories vary. **Dementia** involves cognitive impairment beyond typical ageing; a classroom vignette or one forgotten item cannot establish a diagnosis.

Language Development

Language is a shared system of arbitrary symbols used to communicate. **Phonemes** are distinctive sound units; **morphemes** are the smallest meaningful units, such as a word or a meaningful ending. **Semantics** concerns meaning; **syntax** concerns word order, within **grammar**. Rule-governed combinations let people generate new messages. Development includes: nonverbal **gestures**, then **cooing**, **babbling**, the **one-word stage**, and **telegraphic speech** (short combinations that often omit function words). Timing varies, and gestures continue alongside speech; they are not abandoned when speaking starts.

Children generalise rules before they master exceptions, which produces **overgeneralization** - saying "goed" instead of "went". This is evidence that they are learning rules, not just copying.

Social and Emotional Development

Ecological systems theory describes development as interacting environments over time. The **microsystem** involves direct contacts; the **mesosystem** involves links between them, such as parent–teacher cooperation. The **exosystem** includes indirect influences, such as a caregiver's workplace. The **macrosystem** involves broader cultural conditions; the **chronosystem** concerns time, life transitions and changing circumstances.

Research identifies **parenting styles**: **authoritarian** (high demands, low warmth), **authoritative** (high demands, high warmth), and **permissive** (low demands, high warmth). Cultural context affects how practices relate to outcomes; these categories do not make a single parenting choice determine a child's future.

Attachment is the emotional bond between infant and caregiver, studied with the **strange situation** procedure. Patterns across separation and reunion inform classification; one isolated reaction does not establish a permanent label. **Temperament**, relatively characteristic emotional reactivity, also relates to attachment. Styles include **secure attachment** and insecure forms (**avoidant**, **anxious**, **disorganized**). **Separation anxiety** is heightened distress when away from a caregiver. Monkey studies highlighted **contact comfort** when infants preferred a soft surrogate while feeding from another. This challenged food-only explanations of attachment; it did not show food is unnecessary or that animal results transfer without limits to humans.

Peer relationships develop through **parallel play** and **pretend play** in childhood, and adolescents often rely more on peers as they age. An **imaginary audience** is a belief that others are especially focused on oneself; a **personal fable** is a belief in the uniqueness of one's experience, sometimes including invulnerability. These are distinct from early-childhood perspective-taking errors.

Erikson proposed a stage theory of **psychosocial development**, in which each stage poses a conflict to resolve - the adolescent stage being **identity versus role confusion**. Across Erikson's theory, conflicts concern trust versus mistrust; autonomy versus shame and doubt; initiative versus guilt; industry versus inferiority; identity versus role confusion; intimacy versus isolation; generativity versus stagnation; integrity versus despair. These are theoretical developmental tasks, not diagnoses or a guarantee of one fixed outcome. A **social clock** describes culturally shaped expectations about life-event timing; **emerging adulthood** is a transition recognised in some social contexts. Supportive adult relationships can develop in families and other close networks. **Adverse childhood experiences (ACEs)** can influence later relationships and health, with context and support affecting outcomes; they do not make a future outcome inevitable. Identity formation can involve exploration and commitment: **achievement** follows exploration and commitment; **moratorium** involves exploration without commitment; **foreclosure** involves commitment without exploration; **diffusion** involves little of either. These processes can concern occupational, religious, racial/ethnic, gender, sexual and family identities.

STYLE	ON SEPARATION	AT REUNION
SECURE	may show distress	seeks contact, is comforted, returns to exploring
ANXIOUS (resistant)	highly distressed	seeks contact *and* resists it; not comforted
AVOIDANT	little distress shown	ignores or avoids the caregiver
DISORGANISED	variable	no consistent strategy — approach and fear together

Interpret separation and **reunion** together. One reaction is not a permanent label; context and temperament also matter

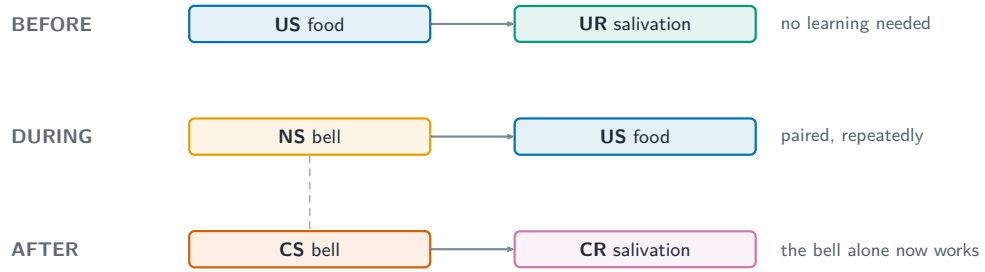
Classical Conditioning

The **behavioral perspective** traditionally emphasised observable behaviour and conditioning, often excluding mental processes from its explanations. Later learning accounts also consider cognition.

Classical conditioning associates one stimulus with another:

- An **unconditioned stimulus (UCS)** naturally produces an **unconditioned response (UCR)** - food causes salivation.
- A **neutral stimulus** paired with the UCS becomes a **conditioned stimulus (CS)**, producing a **conditioned response (CR)**.
- **Acquisition** depends on the order and timing of the pairing.
- **Extinction** occurs when the CS is no longer paired with the UCS; **spontaneous recovery** is the return of a reduced or extinguished CR after a rest interval when the CS is presented again, without a new UCS pairing. Extinction is not necessarily erasure of all prior learning.
- **Generalization** is responding to similar stimuli; **stimulus discrimination** is learning to respond differently to relevant stimuli, rather than requiring a stimulus to be physically identical every time.
- In **higher-order conditioning** a learned CS can support conditioning to another cue without directly pairing that new cue with the original UCS; it is not thereby an originally unlearned stimulus.

Emotional responses can be conditioned, and **taste aversion** shows that some associations are learned in a single trial and illustrates **biological preparedness**: some associations are more readily learned than others. **Counterconditioning** pairs a cue with a response incompatible with the previously learned response; this is a learning principle, not a classroom treatment instruction. **Habituation** is a diminished response to a repeated stimulus.



NS and CS are the same stimulus at different times, UR and CR are named for what elicits them, and may differ in strength. Identify the US, then map the learned cue and response

Operant Conditioning

Operant conditioning associates a behaviour with its consequence.

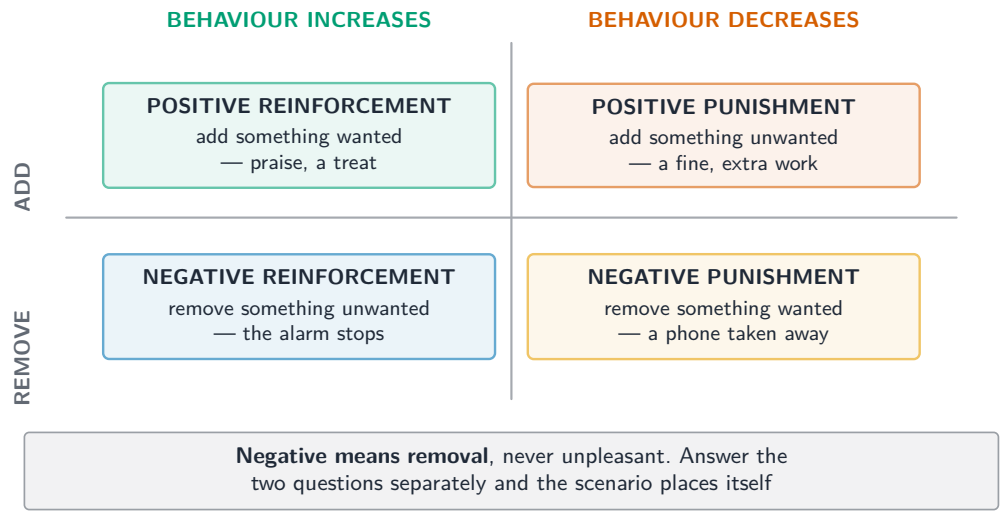
- **Reinforcement** increases a behaviour; **punishment** decreases it.
- **Positive** means something is added; **negative** means something is removed. So **negative reinforcement** increases behaviour by removing something unpleasant - it is not punishment.
- A **primary reinforcer** satisfies a biological need; a **secondary reinforcer** (money) is learned.
- **Shaping** rewards **successive approximations** of a target behaviour.

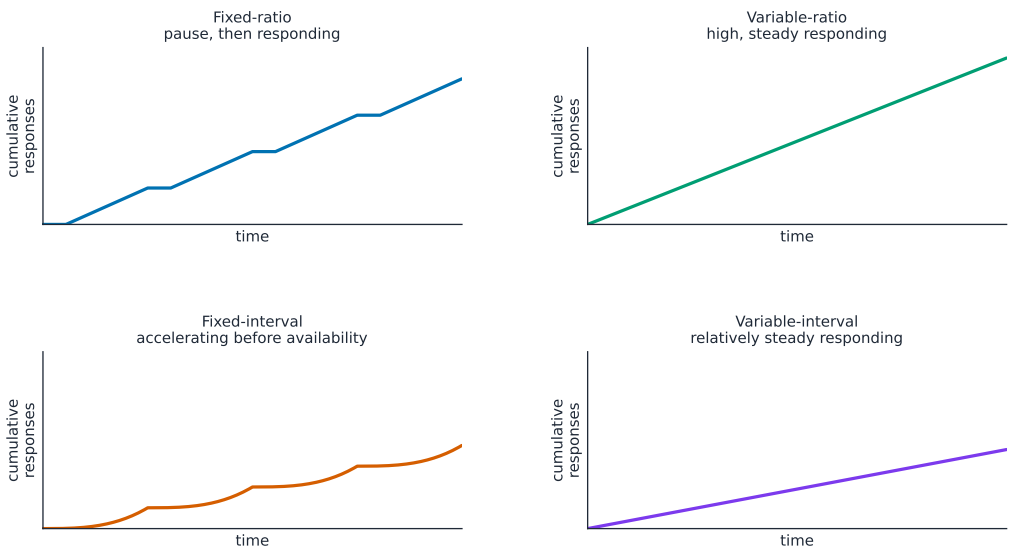
Reinforcement schedules change how strong and persistent learning is. **Continuous reinforcement** rewards every response and produces fast learning but fast extinction. **Partial reinforcement** comes in four kinds - **fixed-ratio**, **variable-ratio**, **fixed-interval**, and **variable-interval** - Ratio schedules depend on response counts; interval schedules reinforce the first qualifying response after time has elapsed. Fixed means predictable, variable means changing. Variable-ratio schedules commonly produce high, steady responding and resistance to extinction; this is not a universal ranking independent of the procedure and values used.

The **law of effect** relates consequences to the future likelihood of behaviour. Reinforcers and punishers are identified by their observed effect, not the adult's intention. **Instinctive drift** occurs when species-typical behaviour interferes with a trained response. Operant discrimination and generalisation concern respond-

ing differently, or similarly, across situations.

Superstitious behavior arises when a consequence reinforces an unrelated action. **Learned helplessness** develops when an organism repeatedly cannot escape an aversive event and stops trying.





Invented teaching curves on common axes, not measured study data; steeper sections indicate faster responding

Observational and Cognitive Learning

Not all learning needs direct experience. **Social learning theory** shows that behaviour can be learned by **observation** and **modeling** - the basis of the Bobo doll findings on imitated aggression.

Insight learning is a sudden solution rather than an overt sequence of rewarded approximations; it need not imply no previous experience of any kind. **Latent learning** is learning that occurs without reinforcement and stays hidden until there is a reason to show it, demonstrated by rats forming a **cognitive map** of a maze.

Worked practice

All following tasks are original. Attempt before reading each worked check.

Developmental design. Researchers test 20-, 40- and 60-year-olds once on an unfamiliar digital task. Older groups score lower. Identify the design and explain why the result alone does not establish within-person cognitive decline.

Check. This is cross-sectional: different ages are compared at one time. Differences in technology experience across cohorts could contribute. Following the same people would reveal within-person change, but attrition and practice effects would still need attention.

Schemas and perspective. Mei expects all round play objects to bounce. She tries bouncing a wooden bead, then changes her category to distinguish beads from rubber balls. Later she holds up a picture facing herself and assumes her friend can see it. Explain assimilation, accommodation and egocentrism using separate details.

Check. Treating the bead as a familiar bouncing object fits an existing schema: assimilation. Revising the category is accommodation. Assuming the friend sees her own view demonstrates difficulty taking another perspective, not proof of selfish intent.

Classical conditioning. A harmless tone repeatedly precedes a puff of air that naturally causes blinking. Later the tone alone causes blinking. Identify UCS, UCR, CS and CR. Repeated tones without air reduce blinking; after a rest, the tone again elicits some blinking. Explain these two changes.

Check. Air puff is UCS, blinking to air is UCR, the learned tone is CS, and blinking to the tone is CR. Reduced responding without air is extinction; return after rest without renewed air pairing is spontaneous recovery. UCR and CR share a response category but need not have identical strength or timing. This is a hypothetical learning example, not an instruction for an experiment on classmates.

Operant consequences. In a fictional case, fastening a seatbelt stops a buzzer and future prompt fastening increases. Separately, a learner loses game time after interrupting and future interruption decreases. Classify both using the event added/removed and observed change in behaviour.

Check. Stopping the buzzer is removal plus increased fastening: negative reinforce-

ment. Removing game time with decreased interruption is negative punishment. If behaviour did not change, the intended label would not be established by the consequence alone.

Schedule comparison. A reward follows every fifth correct response in A; the first correct response after five minutes in B; and a changing number of correct responses averaging five in C. Identify schedules and explain why persistent responding alone would not establish C.

Check. A is fixed-ratio, B fixed-interval and C variable-ratio. The programmed contingency determines the label. Persistence without information about response count, time and predictability is insufficient.

Evidence and discrimination. Fictional task data: after training that rewards a response to a blue signal but not a yellow signal, mean responses in equal 60-second test periods are 8 for blue and 2 for yellow. Explain how the result supports discrimination and give a limit.

Check. More responding to the rewarded cue than the other cue is consistent with learned discrimination. The difference in means is 6 responses, but these means alone do not establish statistical significance, prove every individual discriminated or exclude every alternative explanation. This is not actual study data.

Exam tips

Use the scenario's relevant detail and explain the concept–detail connection. A definition alone does not demonstrate application; follow the specific question rather than relying on a universal mark formula. For evidence questions, use a specific result and explain why it supports or qualifies the claim. Distinguish age from cohort, participation from formal labels, learning from its visible performance, and intended consequences from observed changes in behaviour. Identify a reinforcement schedule from its contingency, not a gambling-like mood or persistence alone.

Sources and demand grounding

Scope: local AP Psychology CED topics 3.1–3.9, PDF pages 81–95, with College Board's October 2025 clarifications, including spontaneous recovery. Excluded prenatal stage names, psychosexual stage theory, language pragmatics and named timing subtypes of conditioning are not added.

The local 2024 set 1 Q1 and official guidelines were read to verify the older Gavin scenario's concept-application demands. This is a legacy-format example, not the current exam format. Local 2025 set 2 AAQ and its official guidelines were spot-checked for operational definitions, data interpretation, generalisability and evidence-based explanation of stimulus discrimination. Original practice targets these skills without reproducing a whole exam. College Board's released-exam page notes that older materials do not completely align with the revised exam. Historical papers, bank entries and syllabus files were not changed.

Vocabulary card meanings

discontinuous: Developing in distinct stages rather than by smooth gradual change. teratogens: Agents such as certain drugs or infections that can harm a developing embryo. sensitive period: A window of time when experience has an especially strong effect on development. Adolescence: The transition from childhood to adulthood, including puberty. primary sex characteristics: The reproductive organs present at birth and maturing at puberty. secondary sex characteristics: Body features, such as body hair, that appear at puberty but are not the reproductive organs themselves. menopause: The end of menstrual cycles, usually in midlife. gender: Social roles and identity related to being a woman, a man, or another category. Gender roles: Behaviours a culture expects of people of a given gender identity. socialization: Learning the behaviours and values of one's society. Sexual orientation: The pattern of emotional and sexual attraction to other people. Sensorimotor stage: Piaget's first stage, when infants know the world through senses and actions. object permanence: Understanding that things continue to exist when they are out of sight. Preoperational stage: Piaget's stage of symbolic play before logical mental operations. egocentrism: Difficulty seeing a situation from someone else's point of view. Concrete operational stage: Piaget's stage of logical thought about real, tangible things. Formal operational stage: Piaget's stage of abstract, hypothetical reasoning. scaffolding: Temporary support from a more skilled person, reduced as skill grows. Dementia: A loss of mental ability, severe enough to interfere with daily life. gestures: Hand or body movements used to communicate. cooing: The soft vowel sounds infants make in the early months. overgeneralization: Applying a language rule too widely, as in saying goed. strange situation: A laboratory procedure that observes how an infant responds to separations and reunions. secure attachment: A pattern in which an infant seeks the caregiver and is comforted on return. avoidant: An attachment pattern of emotional distance from the caregiver. anxious: An attachment pattern of clinginess and worry about the caregiver. disorganized: An attachment pattern of confused, contradictory behaviour toward the caregiver. Separation anxiety: Distress when a familiar caregiver leaves. contact comfort: The soothing effect of soft physical touch, beyond food alone. parallel play: Children playing beside each other without truly playing together. pretend play: Play in which a child treats objects or roles as something else. Erikson: The theorist who framed personality growth as social crises across the lifespan. psychosocial development: Growth through social challenges, from trust in infancy to integrity in old age. identity versus role confusion: The adolescent task of forming a stable sense of self. Adverse childhood experiences (ACEs): Potentially traumatic events in childhood, such as abuse or household dysfunction, linked with later risk. behavioral perspective: An approach that explains actions through learning from the environment. Classical conditioning: Learning to link a neutral signal with another stimulus that already brings a response. unconditioned stimulus (UCS): A stimulus that naturally triggers a response, with no learning required. unconditioned response (UCR): The automatic response to a stimulus that needs no learning. conditioned stimulus (CS): A previously neutral signal that, after learning, triggers a response. conditioned

response (CR): The learned response to a signal that was once neutral. Generalization: Responding to stimuli that resemble the one that was learned. stimulus discrimination: Learning to respond to one stimulus and not to similar others. higher-order conditioning: Using an already learned signal to teach a response to a further signal. taste aversion: A learned dislike of a food that was followed by illness. Operant conditioning: Learning in which behaviour is strengthened or weakened by its consequences. Reinforcement: A consequence that makes a behaviour more likely to be repeated. negative reinforcement: Removing something unpleasant so that a behaviour becomes more likely. Reinforcement schedules: Rules for how often a consequence follows a behaviour. Partial reinforcement: Rewarding a behaviour only some of the times it occurs. fixed-ratio: A reward after a set number of responses. variable-ratio: A reward after a changing number of responses. fixed-interval: A reward for the first response after a set amount of time. variable-interval: A reward for the first response after a changing amount of time. Superstitious behavior: Repeating a behaviour because a reward happened to follow it by chance. modeling: Learning by watching and copying another person. cognitive map: A mental layout of a place, which can guide later movement. Gross motor skills: Large movements that use the whole body, such as running. fine motor skills: Small, precise movements, such as writing or buttoning. imprinting: A rapid attachment some young animals form to the first moving object they see. spermarche: A boy's first ejaculation. A nocturnal emission can be that event, but it is not the only form. reversibility: Understanding that an operation can be undone, returning to the start. Animism: A young child's belief that objects such as toys have feelings. Theory of mind: Understanding that other people have beliefs and desires of their own. Phonemes: The smallest speech sounds that distinguish one word from another. Temperament: Inborn tendencies in reactivity and self-regulation. personal fable: An adolescent belief that one's own experiences are unique and that one is specially protected. social clock: A culture's expected timing for events such as leaving home or marrying. achievement: An identity status of exploring options and then making a commitment. foreclosure: An identity status of committing to a path without having explored it. Counterconditioning: Replacing an unwanted response by pairing the trigger with a new, incompatible response. law of effect: The principle that responses followed by satisfying results are more likely to recur. Instinctive drift: Learned behaviour sliding back toward an animal's inborn patterns.