

Glossary

A

- A not B error** An object-searching error that is often made by 8–12-month-olds. Infants making this error will look for an object where they have most often found it (location A) rather than where they last saw it (location B).
- Abstraction principle** The principle that the number in a set is independent of any qualities of the members in that set, so it doesn't matter if you are counting the number of butterflies or the number of different animals, the counting principles will be the same.
- Accommodation** The cognitive process through which children adapt to new experiences by modifying their preexisting **schemas**. An important process in Piaget's theory. See **assimilation** and **functional invariants**, and also **visual accommodation**.
- Affect** Emotional state or feelings. Contrast with behavior (what one does in a situation) and **cognition** (how one thinks about a situation).
- Affective process** A process that deals with an individual's emotional state.
- Age-cohort design** See **sequential design**.
- Alleles** Genes for the same characteristic located in the same place on a pair of **chromosomes**.
- Alphabetic script** A writing system in which written symbols (letters) correspond to spoken sounds; generally, individual **phonemes** represent the individual letters of an alphabetic script.
- Ambiguous figure** A figure that can be perceived in two (or more) different ways.
- Amniocentesis** A medical procedure that removes fetal cells from the amniotic sac (the fluid that protects the fetus) for analysis. This procedure is usually carried out between the fourteenth and sixteenth week after conception and can diagnose fetal genetic and developmental disorders.
- Analogical reasoning** Resolving a problem by comparing it to a similar problem that has been solved previously.
- Animism** A characteristic of children's thinking in Piaget's **preoperational stage** in which they tend to attribute life and life-like qualities to inanimate objects, particularly those that move and are active, such as the wind and the clouds, and sometimes toys and other objects.
- Antisocial behavior** Any behavior that shows scant concern about other people's feelings and needs. There is little morality associated with this behavior.
- Appearance–reality distinction** An awareness that things are not always what they appear to be. Young children often fail to make this distinction and when shown an object that looks

like something else (e.g., a sponge that looks like a rock), they will often give either **phenomenism** answers and report the appearance (“it’s a rock”), or **realism** answers and report the reality of the object (“it’s a sponge”).

Assimilation The process through which children incorporate new experiences into their preexisting **schemas** – that is, they *assimilate* the new to their already-existing schemes of thought. An important process in Piaget’s theory. See also **accommodation** and **functional invariants**.

Associative activity An activity in which children interact with one another, performing similar tasks.

Assortative mating The tendency for spouses or partners to be similar in biological and/or psychological characteristics, for instance in height, attractiveness, intelligence.

Attachment behavior Any behavior that helps to form or establish an emotional bond between two individuals. Strong attachment bonds are usually formed between an infant and his or her caregiver. Children with **autism** typically display few, and odd, attachment behaviors.

Attainment targets Descriptions of the knowledge that a child should have acquired as she works her way through the education system.

Attention deficit disorder (ADD or ADHD) A disorder that is characterized by an inability to concentrate on one task at a time and a pervasive impulsivity, which often results in severe behavioral problems and **developmental delay**. Hyperactivity commonly accompanies this disorder, hence ADHD.

Attributions The belief one holds as to why people carry out a particular action or behavior.

Authoritarian parenting Authoritarian parents are high on demandingness and low on responsiveness. They value obedience as a virtue and favor punitive, forceful means to curb the self-will of their offspring. They do not foster their children’s autonomy, but rather try to restrict independent behavior. In contrast with children raised by authoritative parents, children raised by authoritarian parents are less socially skilled, less self-assured, less curious, more dependent, and more passive. See also **authoritative parenting**, **indulgent parenting**, and **neglectful parenting**.

Authoritative parenting Authoritative parents are high on responsiveness and demandingness. They set clear standards of behavior for their children that take into account the child’s developing capabilities and needs. These parents are considered warm and responsive to the needs of their children. Children raised by authoritative parents tend to be more socially competent, self-reliant, self-controlled, more responsible, creative, and intellectually curious than their **peers**. See also **authoritarian parenting**, **indulgent parenting**, and **neglectful parenting**.

Autism A disorder that affects a person’s ability to relate to others. Autistic individuals typically have problems with communication, forming attachments with other people (**attachment behavior**), and lack a **theory of mind**. Autistic people usually avoid social contact and may seek a monotony of environment and action (resulting in repetitive stereotyped movements) which appear to provide some comfort. These problems are often referred to as **Wing’s triad of impairments**. Occasionally, some autistic individuals demonstrate extreme talents (**savant skills**) in certain activities (e.g., the ability to accurately draw a building, or to mentally compute seven-figure prime numbers); however, these talents are uncommon. Autism is a rare condition (approximately 4 per 10,000 live births) that is usually inherited but can result from brain damage.

Autonomous stage of moral reasoning A stage of moral reasoning described by Piaget, found in children from about age 10. Obligations, rights, and rules are no longer felt to be one-way or unilateral (as in the earlier **heteronomous stage**), but reciprocal. Children and adults in this stage take actors’ intentions into account when judging moral actions.

Autonomy Being in complete control of one’s life.

Autosomal genetic disorders Disorders resulting from a mutation in a gene in one of the nonsex **chromosomes**. Well-known examples are cystic fibrosis (a recessive type) and achondroplasia (dwarfism, a dominant type).

Autosomes The 22 pairs of human **chromosomes**, with the exception of the sex chromosomes. See also **autosomal genetic disorders**.

Axon The tail-like part of a **neuron** which transmits impulses (the actual message) away from the cell body.

B

Babbling The first types of controlled vocalizations produced by infants typically between the ages of 4 and 9 months. See also **canonical** and **modulated babbling**.

Baby biographies Diaries detailing an infant's development, usually kept by the infant's parents or caregiver. Charles Darwin's biography of his eldest son's development is a well-known example.

Baseline group Another term for **control group**.

Behavior genetics The study of how genetic factors influence behavior and, more generally, differences between individuals.

Behaviorism The theoretical view, associated with J. B. Watson and B. F. Skinner, that sees directly observable behavior as the proper focus of study, and which sees the developing child as a passive respondent to conditioning, reinforcement, and punishment. Emphasizes the role of learning (**nurture**) in causing development rather than inherited factors (**nature**).

Blindisms Stereotyped repetitive behaviors that are commonly observed in children with **profound visual impairment**. The most common of these behaviors are eye poking, body rocking, repetitive hand and finger movements, and repetitive manipulation of objects.

Bottom-up structures Bottom-up structures are data driven and the output does not depend on prior knowledge and experience. Compare with **top-down structures**.

Bullying Term used to define an individual's repeated exposure to negative actions by one or more other students. There are two types of bullying, direct and indirect. **Direct bullying** refers to cases where there are open attacks on the victim that are often physical in nature but also include taunting or verbal abuse. **Indirect bullying** refers to cases where individuals are socially isolated and intentionally excluded from a group. See **provocative victim** and **passive or submissive victim**.

C

Canonical The usual, normal, or natural appearance of things. *Canonical babbling* refers to **babbling** sounds made by the infant around 6–10 months, when vowels and consonants are combined in such a way that they sound like words. However, there is no evidence that infants actually attach meaning to these sound combinations. See also **modulated babbling**.

Cardinality The numerical principle that states that any set of items with a particular number is equal in quantity to any other set with the same number of items in it. Therefore, a set of four cars and a set of four buttons may look very different, but cardinality states that there is the same number in each set despite obvious visual differences.

Castration complex See **Oedipus complex**.

Catharsis hypothesis The argument that watching aggressive tendencies in others will reduce your own feelings of aggression.

Central coherence The ability to combine several pieces of information to form an overall understanding of an issue or of what is perceived.

- Centration** The focusing or centering of attention on one aspect of a situation to the exclusion of others.
- Cephalocaudal trend** Motor development that proceeds in infancy from head to foot along the length of the body – that is, control of the head is first, then the arms and trunk, and finally control of the legs. See also **proximodistal trend**.
- Cerebral cortex** The area of the brain that is associated with complex tasks such as memory, language, and thoughts and the control and integration of movement and the senses.
- Chemosensory development** Encompasses both the gustatory (taste) and olfactory (smell) senses.
- Childhood amnesia** See **infantile amnesia**.
- Chromosomes** Strands of DNA (deoxyribonucleic acid) and protein that contain the genes and provide the genetic blueprint for the animal or plant. In humans there are 23 pairs of chromosomes, 22 **autosomes** and one pair of sex chromosomes, the latter often referred to as X and Y genes.
- Chronological age (CA)** A person's actual age, as opposed to his or her **mental age**.
- Circadian rhythm** Bodily cycles within the body that occur on a 24-hour cycle, such as patterns of sleeping/waking.
- Class inclusion** The ability to coordinate and reason about parts and wholes simultaneously in recognizing relations between classes and subclasses.
- Classical conditioning** A method of learning first investigated by the Russian physiologist Ivan Pavlov in the early part of the twentieth century. In this form of conditioning, certain behaviors can be elicited by a neutral (normally unstimulating) stimulus because of its learned association with a more powerful stimulus. In Pavlov's experiments dogs learned to salivate at the sound of a bell. An important form of learning in **behaviorism**; see also **operant conditioning**.
- Clinical method** Research method first used by Piaget whereby natural behavior is observed and then the individual's environment is changed in order to understand better the behavior of interest.
- Cluster effect** Memory for test items is significantly improved if the items can be grouped together according to some category or principle, e.g., items of furniture; cutlery used to eat with; animals, etc.
- Cochlea** The inner ear, a structure encased in bone that contains the receptors for sound.
- Cognition** Mental activity, such as attention, memory, problem-solving, thinking, intelligence.
- Cognitive adaptations** Children's developing cognitive awareness of the world. As a result of cognitive adaptations they become better able to understand their world.
- Cognitive conflict** Cognitive conflict arises when there are two or more competing solutions to a situation or problem.
- Cognitive development** The development of behaviors that relate to perception, attention, thinking, remembering, and problem-solving.
- Cognitive functioning** See **cognition**.
- Cognitive processes** Mental activities and processes. See **cognition** and **information processing**.
- Cohort** A group of people who were raised in the same environment or who share certain demographic characteristics, for example a group of people born at approximately the same time.
- Collaborative learning** Any learning that occurs when two or more people work together on a problem or situation.
- Combinatory thought** Before a child can pass a **conservation task**, he or she must possess combinatory thought, i.e., he or she must be able to take more than one factor into consideration. For example, when given the conservation of continuous quantity task where water is poured from one beaker to a different-sized beaker, the child must consider both the height and the width of the beakers before making judgments about the volume of water contained within them.

Comprehension In language development, the language children can understand, distinguished from *production*, which is the language they can produce. Comprehension almost always exceeds production.

Conceptual shift A large qualitative change in an individual's **cognitive processes**.

Concrete operations stage The third Piagetian stage of development in which reasoning is said to become more logical, systematic, and rational in its application to concrete objects. However, abstract thinking is still not fully developed. The concrete operations stage is characteristic of children between about 7 and 11 years of age. See also **conservation** and **reversibility**.

Conditional spelling rules Rules that need to be learned in order to spell certain words; for example, the final "e" that lengthens and changes the quality of the preceding vowel ("hop" as opposed to "hope"). Another example is the way that consonants are doubled in order to shorten the preceding vowel ("hopping" as opposed to "hoping").

Conduct disorder General term used to describe serious behavioral problems in children, including **antisocial** and rule-breaking behavior.

Cones and rods See **rods and cones**.

Configurational processing Any processing that pays particular attention to the overall configuration of the smaller elements within the object being perceived rather than the individual features or elements. Attention to the individual elements is known as **featural processing**. See also **encoding switch hypothesis**.

Congenital Present from birth.

Connectionism A modern theoretical approach that developed from **information-processing** accounts in which computers are programmed to simulate the action of the brain and nerve cells (**neurons**). The programs create so-called artificial **neural networks**. Connectionist models have been applied to many areas of child development, e.g., perception, attention, learning, memory, language, problem-solving, and reasoning.

Conservation The recognition that certain properties of objects (such as number, liquid [or continuous quantity], length, mass [or weight], and volume) are not altered by superficial transformations in appearance, such as changes in length or shape. Children become able to conserve in Piaget's **concrete operations stage**. See also **conservation tasks**.

Conservation tasks These are tasks that examine children's ability to understand that physical attributes of objects, such as their mass and weight, do not vary when the object changes shape. An example would be to show a child two identical beakers containing equal volumes of water. The content of one beaker is then poured into a smaller but broader beaker. One beaker's water level is now much higher, but obviously they both contain the same amount of water. A child who understands the fact that the volume has not changed, despite its change in appearance, will tell you both beakers contain the same amount of water, whereas a child who does not have this knowledge will point to one of the beakers thinking that one has the most water.

Constructivism Piaget's theoretical view that infants are not born with knowledge about the world, but instead gradually construct knowledge and the ability to represent reality mentally.

Continuity in social development Some behaviors show a very strong consistency throughout development, for example the tendency for children to be aggressive shows considerable continuity: the child who fights with other children a lot is likely to be the adolescent who is judged by **peers** to be aggressive.

Continuity versus discontinuity Whether development is *continuous*, and therefore an accumulation of "more of the same," or *discontinuous* and marked by qualitative changes. Piaget's theory is an example of a *discontinuous* theory of development.

Continuous function – decreasing ability Behavior that gets worse as we age. For example, young infants can initially distinguish non-native speech sounds very easily; however, for

many sounds they lose this ability after their first year of life. See also **continuous function – increasing ability**, **discontinuous (step) function**, and **U-shaped functions**.

Continuous function – increasing ability Behavior that improves with age. For example, during the first year of life the precision with which infants reach for objects increases. See also **continuous function – decreasing ability**, **discontinuous (step) function**, and **U-shaped functions**.

Control group In order to evaluate the effectiveness of a particular treatment or manipulation, the control group is that group of individuals in an experiment who do not receive the treatment. Their behavior is then compared with that of the **experimental group**, which does receive the treatment.

Cooperative activity An activity in which children interact together in complementary ways; for example, one child gets blocks out of a box and hands them to another child, who builds a tower.

Core knowledge A basic store of information about the world, particularly knowledge about the physical properties of objects, available to the very young infant and probably an **innate mechanism**.

Correlation coefficient A statistical measure ranging from +1.00 to –1.00 that indicates the strength, as well as the direction, of the relationship between two variables. A correlation coefficient varies between +1 (high positive correlation) through zero (no relationship) to –1 (high negative correlation).

Correlational study A study that examines whether two variables vary systematically in relation to each other, e.g., as height increases, will weight reliably increase also?

Critical period A limited period, usually early in an animal's life, in which the young have to be exposed to a particular skill or experience in order for it to be learned. **Imprinting** was thought to occur only during a brief critical period, but it is now known that this can be extended and the concept of **sensitive period** is often used instead.

Cross-cultural study A study which aims to examine differences that arise purely from culture. An example would be to examine whether there are different **developmental milestones** in different regions of the world.

Cross-sectional design A study where children of different ages are observed at a single point in time. Compare with **longitudinal design**.

Crystallized intelligence The store of information, skills, and strategies acquired through education and prior experience. Knowing the capital cities of every country is an example of crystallized intelligence. See also **fluid intelligence**.

Cultural tools Any tools that help us to calculate, produce models, make predictions, and understand the world more fully, e.g., abacuses, slide rules, calculators, and computers.

Curriculum A specific course of academic studies.

D

Deceptive box task This task involves showing children a characteristic box that they will have had some experience with before (e.g., a Smarties tube or M&Ms box that usually contains sweets/candies). The child must say what she thinks is in the box. Usually she will reply “Smarties”/ “M&Ms.” She is then shown that the box actually contains pencils. The child is then asked, “What did you originally think was in the box?” Children under the age of 4 will typically say, “Pencils.” This task is used to determine whether a child possesses a **theory of mind** or not. See also **posting version of the deceptive box test**, **state change test**, and **unexpected transfer test**.

Deductive reasoning The outcome of a specific example is calculated from a general principle, that is, deductive reasoning involves drawing specific conclusions from general premises. See also **inductive reasoning**.

Defense mechanisms In Freud's theory, if an individual's rational thought (**ego**) is threatened by his or her basic desires (**id**) or his or her conscience (**superego**), then various defense mechanisms are available which mean that, for the short term, the individual does not have to deal with the internal conflict. An example of a defense mechanism is repression, whereby an unpleasant thought or memory is blocked and the individual has no memory of the problem. See also **ego**, **id**, and **superego**.

Demand characteristics Cues that are perceived as telling participants how they are expected to behave or respond in a research setting, i.e., social factors that "demand" a certain sort of response. Demand characteristics include the tendency of participants to behave in the way they think the experimenter expects them to behave.

Dependent variable The behavior that is measured or observed in a study. Changes in the behavior are dependent on, that is, caused by, changes to the **independent variable**.

Deprivation dwarfism A small stature and delayed physical development that is often found in children who lack adequate psychological interaction, even though they receive adequate nutrition.

Derivational constancy The process whereby new words are generated from ones with similar meanings. For example, "health" is derived from the word "heal," and this relationship is captured in the spelling of the derived word because its stem preserves the spelling of "heal," even though the vowel sound in the two words is different.

Developmental delay Any delay experienced in a child's development relative to the average child's development. For example, if a child does not reach a **developmental milestone** within the normal range, she can be viewed as having some form of developmental delay; however, this does not necessarily indicate a lasting problem.

Developmental functions Typical trends in development; for example, we typically get more intelligent as we age. See **continuous function – decreasing ability**, **continuous function – increasing ability**, **discontinuous (step) function**, **stage-like changes in development**, and **U-shaped functions**.

Developmental milestones Past research has identified the average age at which children start to exhibit certain behaviors; these are termed developmental milestones. For example, the average age that a child stands alone is 11 months. See also **motor milestones**.

Developmental quotient (DQ) An index of children's development, calculated in the same way as **intelligence quotient (IQ)**. DQ is usually based on perceptual and motor performance rather than on general intellectual development.

Differential psychology The branch of psychology that deals with individual differences between people.

Diffusion of responsibility When acting within a group, individuals do not feel as responsible for their behavior as they would when acting alone. Therefore, a group of individuals can perform an action that none of the individual members would ordinarily carry out.

Direct bullying See **bullying**.

Discontinuous (step) function Development that takes place in a series of stages or steps. Each new stage is qualitatively different from the preceding and following stages. The **moral judgment stages** described by Piaget and Kohlberg are examples of a discontinuous (step) function. See **continuous function – decreasing ability**, **continuous function – increasing ability**, and **U-shaped functions**.

Discovery learning Encouraging children to learn by discovering information for themselves. Often teachers will tailor the child's environment in order to maximize this type of learning.

Dishabituation See **habituation**.

Distributive justice Ensures that rewards and allocations are distributed fairly amongst the members of a group.

- Dizygotic (fraternal) twins** Individuals who are conceived at the same time but result from two eggs being fertilized by different sperm. Thus, they are like regular siblings and share half of their genes. Compare with **monozygotic twins**.
- Domain-general** Knowledge that can be applied to many different situations across many domains. See also **domain-specific**.
- Domain-specific** Knowledge that can only be applied to specific situations that fall within the same domain. See also **domain-general**.
- Dominance** Getting one's own way or influencing others in interpersonal encounters.
- Dosage-response relationship** A relationship existing between the **independent** and the **dependent variables** of a study.
- Down's syndrome (DS)** A **congenital** (present at birth) condition which is characterized by a flattened face, extra folds of skin on the eyelids, stubby fingers, unusual fold of skin on the soles and palms, and an overlarge tongue. DS is a **chromosomal** abnormality that is caused by faulty cell division soon after fertilization, and people with this disorder typically will have severe learning difficulties. The incidence of DS is about 16 to 17 in every 10,000 births, and the incidence rises with the age of the mother.
- d-structure (or deep structure)** The abstract representation of a sentence, or the actual meaning that the sentence is trying to convey. See also **s-structure**.
- Dynamic systems theory** A theoretical approach applied to many areas of development which views the individual as interacting dynamically in a complex system in which all parts interact. As applied to motor development in infancy, dynamic (or dynamical) systems theory views every new developing ability or skill as being jointly influenced by nervous system development, the movement capabilities of the body, and environmental supports for the task or skill the child wants to accomplish.

E

- Echolalia** The repetition of words and phrases previously heard, often in a repetitive and meaningless way. This behavior is common in individuals with **autism**, and the term has also been applied to infants' early vocalizations at around 9 to 12 months when they appear to be "playing with sounds" and show some comprehension of simple words.
- Ecological validity** The results obtained from a study are ecologically valid if they are meaningful in the real world.
- Ego** In Freud's theory, the ego can be thought of as the rational thought that evolved to control the urges of the **id** in order that they meet the demands of reality and maintain social approval and esteem. See also **id**, **defense mechanisms**, and **superego**.
- Egocentric** An egocentric child is one who finds it difficult to see things from another person's point of view. Not to be confused with egotistical.
- Egocentrism** The difficulty or inability of young children to distinguish between their own perspective and that of others. A major characteristic of children's thinking in the **preoperational stage** in Piaget's theory. Widely investigated under the topic of **theory of mind**.
- Elaboration** A memory **mnemonic** that works by making connections between items that have to be remembered. For example, if a child has to remember the pair *fish-fork* in a **paired-associate memory task**, she might imagine eating the fish with a fork. The spontaneous use of this strategy does not appear until adolescence.
- Electra complex** See **Oedipus complex**.
- Embedded shapes** Complete shapes that have been used to form part of a different, larger shape. For example, four triangles can be arranged to form a square. Initially we may just perceive the square, but closer inspection will reveal the triangles also. The Embedded Shapes Test is used to test individuals' visuo-spatial skills.

- Embryo** In human **prenatal development**, the organism 2–12 weeks after conception.
- Emotion** Emotion ranges from simple emotions such as happiness, sadness, fear, and anger, to more complex emotions such as self-consciousness and jealousy.
- Emotion regulation** Adjusting one's emotional state to a suitable level of intensity. This prevents emotional "overload" and allows one to function in a consistent manner.
- Empiricism** The belief that psychological abilities are acquired primarily through experience. Contrast with **nativism**, and see **nature–nurture issue**.
- Encoding switch hypothesis** In face perception, this hypothesis argues that different information about faces is represented in memory by children at different ages. It is suggested that young children rely on information about individual features (e.g., eyes, nose, mouth) in recognizing faces, whereas older children and adults use information about the configuration of the features, that is, the spatial layout. See also **configurational processing** and **featural processing**.
- Encoding** The first stage in the memory system. Information that is attended to gets placed (*encoded*) in the memory storage system. Encoded information enters the **short-term memory** store.
- Environmentalism** The hypothesis that people learn to be the way they are, that the person we become is a consequence of the experiences we have had throughout life. Compare with **genetic determinism** and see **nature–nurture issue**.
- Environmentality** The extent to which variations within a population are caused by environmental factors. Contrast with **heritability**. Often expressed as e^2 .
- Environment–gene correlation** See **gene–environment correlation**.
- Epigenetic principle** The belief that all living things grow according to a design plan or "blueprint" of psychological development. This design is comprised of a few basic "building blocks" that develop into more complex structures through interactions between themselves and the environment.
- Episodic memory** Memory for specific personally experienced events, including their temporal and spatial contexts. Thus, the episodic memory for "market" would represent the trips to the market and where you can buy (for instance) the best cheese; remembering your first lecture/class is another example of an episodic memory.
- Equilibrium** In Piagetian theory, a state in which children's **schemas** are in balance and are undisturbed by conflict.
- Ethnic identity** An awareness of which racial, national, linguistic, or religious group one belongs to.
- Ethological approaches** Approaches which emphasize the evolutionary origins of many behaviors that are important for survival, such as **imprinting**.
- Event sampling** An **observational study** which records what happens during particular events. Events studied include playing, bathtime, feeding, reading, and so on.
- Executive functioning** The process whereby behavior is planned in order that the desired goal will be achieved.
- Experimental group** The group of individuals who receive a particular treatment or manipulation. In order to measure the effectiveness of the treatment, their results are compared with those from a **control group** that does not receive the treatment.
- Experimental methods** Experimental methods control an individual's environment in systematic ways in an attempt to identify which variables influence the behavior of interest.
- Explicit memory** Memory for an experience or event that is easily accessible.
- Expressive language** Language that is particularly expressive in its nature and which uses many social words. A child who has an expressive language style has a tendency to use people's names, words for actions, and strings of words.
- Extraversion** A personality variable. Someone who scores highly on an extraversion scale will typically be an outgoing and confident person. See also **introversion**.

F

- False belief** Incorrectly believing something to be the case when it is not. Often used in **theory of mind** research.
- False positive** Believing something to be true, when in fact it is false.
- Familial resemblance** The resemblance between relatives whose genetic relationship to each other is known.
- Featural processing** In face perception, this refers to a tendency to process the separate features of the face, as opposed to perceiving the relationship between the parts, or **configurational processing**. See also **encoding switch hypothesis**.
- Fetus** In human **prenatal development**, the organism 12 weeks after conception until birth.
- Field theory** Lewin's theory that behavior results from the interaction between a person (his or her genetic influences) and that person's environment (**nurture**).
- Fluid intelligence** Intellectual ability that cannot be taught easily, general ability to grasp new concepts and to think and reason abstractly. This type of intelligence is said to be culture-free since it does not depend upon previous experience. See **crystallized intelligence**.
- Folk theories of development** Ideas held about development that are not based upon scientific investigation.
- Formal operations stage** The fourth Piagetian stage in which the individual acquires the capacity for abstract scientific thought. This includes the ability to theorize about impossible events and items. This stage, which appears from around 11 years, sees the beginnings of **hypothetico-deductive reasoning**, **propositional thought**, and improvements in the capacity for **combinatory thought**.
- Fraternal twins** See **dizygotic twins**.
- Frontal cortex** One of the four main lobes of the **cerebral cortex** (the others being parietal, temporal, and occipital), located behind the eyes and forehead. The frontal cortex is involved in emotional experiences and many cognitive abilities, such as problem-solving, planning, and judgment.
- Functional invariants** Processes that do not change during development, such as **accommodation** and **assimilation** in Piaget's theory. What do change are the cognitive structures (often called **schemas**) that underlie **cognitive development** and allow the child to comprehend the world at progressively higher levels of understanding.

G

- g** The term used to denote general intelligence. Note that it is always written as g and never G.
- Gametes** Male or female reproductive cells, sperm and ova, each of which contains one-half the number of **chromosomes** found in the other cells of the body. See also **meiotic cell division**.
- Gender constancy** The awareness, in early childhood, that one is either a boy or a girl, and that this is unchangeable – once a girl (boy), always a girl (boy).
- Gender development** The developing understanding that a child is either a girl or a boy and that there are gender-appropriate behaviors associated with this difference.
- Gender identity** The awareness that one is a boy, or a girl.
- Gene–environment correlation** The ways in which a child's genetic inheritance affects the environment he or she experiences, and vice versa (also known as **environment–gene correlation**).
- Generalizations** See **overgeneralizations**.
- Genetic determinism** The hypothesis that people become who they are as a consequence of their genetic code. Contrast with **environmentalism** and see **maturation** and **nature–nurture issue**.

Genetic predisposition Any behavior or physical characteristic that is present within an individual's genetic code. These characteristics may not be activated yet, but there is a potential for them. For example, a person may have a genetic predisposition to having a heart problem later in life: this problem will not definitely emerge, but it is more likely to than in someone who does not have such a genetic predisposition.

Genitive A possessive word, for example the apostrophe + "s" in "the boy's jumper" indicates that the jumper belongs to the boy.

Genotype The genetic composition of the individual. Contrast with **phenotype**.

H

Habituation The process by which a response to a stimulus gradually declines over time. For example, infants will initially be very interested in an auditory or visual stimulus and will spend a lot of time attending to it; however, over time they will become bored with the stimulus and their attention to it will decrease. Recovery of attention to a novel stimulus is called **dishabituation**.

Hardware A computer term meaning the size or capacity of its processing units, sometimes used to refer to the child's capacity to comprehend amounts of information. See also **software**.

Head Start A federally supported program in the United States with five components: (1) preschool enrichment education; (2) health screening and referral services; (3) nutrition education and hot meals; (4) social services; and (5) parent education and involvement. Research has indicated that a child's cognitive and language development is enhanced during the period that he or she is participating in a Head Start program. The British equivalent is called Sure Start.

Heritability The extent to which variations within a population are genetically determined. Estimates of heritability range between 0 and 1 – values close to 1 indicate a strong genetic contribution. Often expressed as h^2 . Contrast with **environmentality**.

Heteronomous stage of moral reasoning One of Piaget's stages of moral development. Children in this stage demonstrate a blind obedience to any authority figure, and judge actions by the amount of damage caused rather than in terms of the intentions of the actors. Children in this stage view rules as fixed and rigid, and since they have been laid down by authority figures, they must be obeyed. This is followed by the **autonomous stage** of moral reasoning.

Hierarchy of needs Stages of needs or desires in Abraham Maslow's **humanistic theory** which go from the basic physiological needs for food and water to the ultimate desire for **self-actualization** or the desire to fulfill one's potential.

Horizontal décalage Refers to the nonsynchronous development of children on Piagetian tasks (e.g., cases in which children may succeed on conservation of number tasks but not on conservation of continuous quantity).

Human rights and social welfare morality Kohlberg's final stage of **moral judgment**, also called the **social contract orientation stage**. Individuals who have reached this stage make use of ethical principles to guide moral judgments. Moral decisions are made with reference to the rules one would like to see in an ideal, as opposed to the real, world. Therefore, stealing is acceptable if it is the only way to save another person's life.

Humanistic theory Theory which assumes that growth in the developing child is influenced by the fulfillment of a set of basic needs that constitute a hierarchy, and that higher needs appear when lower, more compelling ones are satisfied. It is argued that healthy children have satisfied their lower, basic needs (for life, safety, love, and esteem) and are motivated by trends toward **self-actualization**.

Hunter-gatherer tribe A tribe of people who live in the traditional fashion of hunting and gathering. In such tribes, it is typical that the individual members will live in small

communities and they depend upon one another for survival. Typically, the males will leave the home base periodically to hunt wild animals, while the females, children, and infirm stay close to the base and gather various fruits and berries for eating also.

Hypothetico-deductive reasoning The ability to develop theories in an attempt to explain certain phenomena, generate hypotheses based on these theories, and systematically devise tests to confirm or refute these hypotheses.

I

Id In Freud's theory, a primitive collection of urges with which an individual begins life. The id is responsible for an individual's "primitive" instincts, such as eating and reproducing. See also **defense mechanisms**, **ego**, and **superego**.

Identical twins See **monozygotic twins**.

Idiots savants Individuals with low intelligence who display an isolated cognitive skill (an **islet of ability**). Such skills include drawing, arithmetic, calculating days of the year, feats of memory, and others. Sometimes found in individuals with **autism**.

Implicit memory Memory for events that we cannot *consciously* remember.

Imprinting A period soon after birth or hatching in which the young of **precocial species** of animals (which includes ducks, geese, sheep, horses) follow the first moving objects they see. Since this is usually the mother, a parent–infant bond is formed and the following response is adaptive (adds to survival value) because it leads to a physical proximity between parent and offspring. The term is also used in Bowlby's theory of attachment to refer to the formation in the early months of the human infant–mother bond.

Independent variable A factor or variable in a study or experiment which can be systematically controlled and varied by the experimenter to see if there are changes in the child's response. The behavior that changes is called the **dependent variable**.

Indirect bullying See **bullying**.

Inductive reasoning Creating a general principle or conclusion from specific examples, that is, drawing a general conclusion from specific premises. See also **deductive reasoning**.

Indulgent parenting Indulgent parents are high on responsiveness, but low on demandingness. They interact with their children in a benign and passive manner and avoid the use of power when dealing with matters of discipline. They make few maturity demands on the children's behavior and allow them a high degree of **autonomy**. Children from indulgent homes are less mature, less responsible, more easily influenced by their **peers**, and less able to take on leadership roles. See also **authoritarian parenting**, **authoritative parenting**, and **neglectful parenting**.

Infant-directed speech The speech that adults and children over 4 years old use when addressing an infant. When compared to speech directed to adults, infant-directed speech has shorter sentences, a higher pitch, more exaggerated pitch contours, a larger pitch range, and is more rhythmic in nature. It is thought that this type of speech helps infants to segment the **speech stream** into individual words. Also known as **motherese**.

Infantile amnesia Inability to remember events during early childhood (first 3 years). Also called childhood amnesia.

Information processing The view that **cognitive processes** are explained in terms of inputs and outputs and that the human mind is a system through which information flows, i.e., information is received and processed by the brain, which then determines how that information will be used. Information processing is a term borrowed from computer programming.

Innate mechanism A mechanism or ability that does not need to be learned, something we are born knowing.

Insecure-avoidant A particular type of **attachment behavior** exhibited in the **strange situation** measure. Insecure-avoidant infants appear indifferent toward their caregiver, and treat the stranger and caregiver in very similar ways. They show very little, if any, distress at being left with the stranger. See also **insecure-resistant** and **securely attached**.

Insecure-resistant A particular type of **attachment behavior** exhibited in the **strange situation** measure. Insecure-resistant infants are overinvolved with the caregiver, showing attachment behavior even during the preseparation episodes, with little exploration or interest in the environment. These infants become very distressed upon separation, but the overactivation of their attachment systems hampers their ability to be comforted by the caregiver upon reunion. See also **insecure-avoidant** and **securely attached**.

Instinct (1) Behavior that is genetic in its origin, e.g., human sexual desire. (2) A feeling or **emotion** that has no basis in fact, e.g., “My instinct tells me he’s not to be trusted.”

Instrumental morality The second of Kohlberg’s **moral judgment stages**. In this stage individuals (usually children) become aware that other people have intentions and desires, and that there are two sides to every argument. Moral decisions are made by referring to the side that provides the greatest benefit. Therefore, if someone is very helpful to you, it is acceptable to steal in order to save that person’s life.

Intelligence quotient (IQ) An IQ score gives an indication of an individual’s intelligence compared with other individuals of the same **chronological age**. Originally, IQ was calculated in children by dividing a child’s **mental age** by his or her chronological age and multiplying by 100, although a slightly different calculation is now used. **Intelligence test** scores stabilize in adolescence and a different calculation is used for older children and adults. A score of 100 denotes a person as having average intelligence for his or her age.

Intelligence tests Any test that aims to measure an individual’s intellectual ability. These tests have traditionally concentrated on **intelligence quotient (IQ)**, but modern tests now examine both **crystallized** and **fluid intelligence**.

Intermental ability **Cognitive** knowledge that has been learned through individual attainment. Compare with **intra mental ability**.

Interpersonal normative morality This third stage of Kohlberg’s **moral judgment stages** is sometimes referred to as the “good boy/good girl orientation.” Individuals in this stage seek to be viewed as “good” and feel guilt when it is likely that others will condemn their behavior. Therefore, an action is acceptable if it can be said that someone’s heart was in the right place, even if that person breaks rules. For example, stealing to save your wife’s life is acceptable as long as you want to be a good husband.

Intersubjectivity Taking account of other people’s intentions, thoughts, emotions, and feelings in deciding what to do. When this involves shared attention with both objects and another person(s), it is termed **secondary intersubjectivity**.

Intervention group Another term for **experimental group**.

Intonation The rhythmic pattern of speech. For example, the meaning of a sentence is changed when the ending has a raised pitch, e.g. “He didn’t come” versus “He didn’t come?”

Intra mental ability **Cognitive** knowledge that has been learned through group involvement. Compare with **intermental ability**.

Intrasyllabic units These are units of speech that are smaller than **syllables** but larger than **phonemes**. **Onset** and **rime** are two examples of intrasyllabic units.

Introspectionism An approach to psychology common in the nineteenth century in which observers were asked to reflect on their thoughts, feelings, and perceptions.

Introversion A personality variable. Someone who scores highly on an introversion scale will typically be very quiet and reserved. See also **extraversion**.

Intuitive psychology The awareness some people have regarding others’ desires, motives, and beliefs; they appear able to anticipate others’ reactions and behavior.

Intuitive scientists The idea that we are all capable of constructing commonsense theories to explain how the world works, and are able to conduct “experiments” to test them.

Invariance, principle of As used in connection with **conservation**, the principle that quantities remain unchanged if nothing is added or subtracted.

IQ test See **Intelligence test**.

Islets of ability See **idiots savants**.

K

Key stages Each key stage represents one British school year, and a number of **attainment targets** are set for each key stage.

L

Last-number-counted principle The principle that the last number counted represents the value for that set.

Law of effect Law or rule devised by the American psychologist Edward Lee Thorndike which states that the likelihood of an action being repeated is increased if it leads to reward, and decreased if it leads to punishment.

Letter–sound associations Where one letter represents one sound or **phoneme**.

Lexical skills The understanding of what constitutes acceptable speech and language, including understanding words and grammar.

Libidinal forces Sexual desires. Freud thought these were under the control of the **id**.

Life space Lewin argues that a person’s environment can be divided into regions that are separated by more or less permeable boundaries that correspond to the individual’s characteristics, needs, and perceptions of the environment. The person and the environment represent inseparable constructs, which together constitute the life space.

Longitudinal design A study where repeated observations of the same group of children are made at different points in their development. Compare with **cross-sectional design**.

Long-term memory Items stored in the long-term memory have passed through the **short-term memory** and are now stored for an extended period of time.

M

Maternal deprivation A term to describe the deprivation an infant experiences as a result of long-term separation from his or her mother, or from being orphaned.

Maturation Aspects of development that are largely under genetic control, and hence largely uninfluenced by environmental factors. Not to be confused with maturing, which means development into the mature or adult state, however caused.

Maturational unfolding A pattern of growth which is genetically predetermined (see **genetic determinism**) and which unfolds during childhood.

Mechanistic world view The idea that a person can be represented as being like a machine (such as a computer), which is inherently passive until stimulated by the environment. This viewpoint argues that a child’s development is controlled only through environmental input and is little influenced by genetics. **Behaviorism** is an example of this world view. See also **organismic world view**.

Meiotic cell division The type of cell division that occurs in sexually reproducing organisms which halves the number of **chromosomes** in reproductive cells (sperm and ova), leading to the production of **gametes**.

- Mental age (MA)** The level of mental skills that is average for a particular age group. If a child has a **developmental delay**, then her mental age will be lower than her **chronological age**, and vice versa for bright children.
- Meta-analysis** An analysis of many studies on the same topic in order to draw general or overall conclusions.
- Metacognition** Knowledge of one's state of mind, reflective access to one's cognitive abilities, thinking about how you are feeling or thinking.
- Metamemory** Understanding one's own memory and having an awareness of the ways in which memory works and can be improved.
- Microgenetic studies** Studies of development that observe individual children in great detail from the time they first attempt a new skill, such as walking or crawling, until it is performed effortlessly.
- Mnemonic strategy** Any strategy that helps to improve one's own memory. Mnemonic strategies include **elaboration**, **organization**, and **rehearsal**.
- Modulated babbling** This is the final period of babbling and language play and appears from around 10 months on. This period is characterized by a variety of sound combinations, stress and **intonation** patterns, and overlaps with the beginning of meaningful speech. Modulated babbling may play an important role in the acquisition of the intonation patterns that are important for the infant's native language. See also **babbling** and **canonical**.
- Monotropy** The view that the infant has a basic need to form an attachment with one significant person, usually the mother. A central claim in Bowlby's early theory of attachment formation.
- Monozygotic (identical) twins** Genetically identical twins, developed from one ovum and one sperm which divides into two shortly after conception. Such twins have the same genetic make-up. Compare with **dizygotic twins**.
- Mora** A rhythmic unit in languages like Japanese and Tamil that can be either a syllable or part of a syllable. In English a mora roughly corresponds to a consonant–vowel syllable with a short vowel, e.g., “the” as opposed to “thee,” which has a long vowel, or to “them,” which ends with a consonant. “Thee” and “them” each consist of two moras.
- Moral dilemmas** Situations in which people must choose and justify a course of action or reasoning with respect to a moral issue. Hypothetical moral dilemmas are often used as research tools to examine the development of moral reasoning.
- Moral judgment stages** Piaget described two stages in the development of moral reasoning, the **heteronomous stage** and the **autonomous stage**. Kohlberg described five stages, the earlier of which overlap with Piaget's. The five stages are **punishment and obedience orientation**, **instrumental morality**, **interpersonal normative morality**, **social system morality**, and **human rights and social welfare morality**.
- Moratorium** Period in an individual's life when they identify with a string of different values, beliefs, and ideologies owing to the lack of a stable and consistent self-image.
- Morpheme** The smallest unit of sound that carries meaning. The past verb “cooked” has two morphemes, the stem “cook” and the /t/ sound at the end, which tells you that it is about a past action. The plural “dogs” also has two morphemes, “dog” and “s.”
- Motherese** Another name for **infant-directed speech**.
- Motor milestones** The basic motor skills acquired in infancy and early childhood, such as sitting unaided, standing, crawling, walking.
- Myelin** A fatty insulator which prevents leakage of the messages traveling along the nerves, and increases the speed of neural transmission.
- Myelination** The process by which **myelin** is formed around the **neurons**. Myelination begins in the sixth month of life in the **fetus** but continues through childhood.

N

- National Curriculum** The **curriculum** that is followed in all schools in the UK. The government sets the particulars of the subjects covered by the National Curriculum.
- Nativism** The belief that psychological abilities are the product of genetic inheritance – we are simply the product of our genes. Nativism argues that attributes such as intelligence or personality are inherited, and therefore cannot be changed. Contrast with **empiricism**, and see also **maturation** and **nature–nurture issue**.
- Nature–nurture issue** Ongoing debate on whether development is the result of an individual’s genes (nature) or the kinds of experiences they have throughout their life (**nurture**). See also **empiricism**, **environmentalism**, **environmentality**, **genetic determinism**, **heritability**, **nativism**.
- Neglectful parenting** Neglectful parents are low on responsiveness and demandingness. They try to minimize the amount of time and energy required to raise their children. They know little about their children’s lives, interact sparingly with them, and do not include them in making decisions that affect the family. Children from neglectful homes are often impulsive and more likely to be involved in delinquent behaviors such as precocious experimentation with sex, alcohol, and drugs. See also **authoritarian parenting**, **authoritative parenting**, and **indulgent parenting**.
- Neo-cortex** In evolutionary terms, the most recently developed areas of the **cerebral cortex**.
- Neural networks** Artificial computer programs that are intended to simulate the action of the brain and nerve cells. A central concept in **connectionism**.
- Neuron** Nerve cells within the central nervous system which transmit messages between cells.
- Neuropsychological deficits** A disorder that stems from the brain which affects a person’s behavior or **cognitive functioning**.
- Norm referencing** Tests that give the average scores for the population, and hence provide a reference point to indicate how individual children perform relative to the scores of other children.
- Nurture** The belief that psychological abilities are the product of our environment. See **nature–nurture issue**.

O

- Object permanence** The ability to understand that even if an object is no longer visible, it continues to exist.
- Object unity** Perceiving an object as complete despite the fact that parts of it cannot be seen.
- Observational learning** Situation in which people (especially children) learn by observing others and then copying (imitating) the observed acts. Imitation is often influenced by vicarious reinforcement, which is seeing if others are rewarded for producing the behaviors or acts that are observed. A key concept in **social learning theory**.
- Observational studies** Studies in which behavior is simply observed and recorded, and the researcher does not attempt to influence the individual’s natural behavior in any way.
- Oedipus complex** An important stage of development in Freud’s **psychoanalytic theory**. This expression derives from the Greek myth in which Oedipus became infatuated with his mother. In the Freudian account, the young boy develops sexual feelings toward his mother but realizes that his father is a major competitor for her (sexual) affections. He then fears castration at the hands of his father (the castration complex), and in order to resolve this complex he adopts the ideals of his father and the **superego** (the conscience) develops. For young girls the **Electra complex** is when they develop feelings toward their father and fear retribution at the hands of their mother. They resolve this by empathizing with their mother, adopting the ideals she offers, and so the girl’s superego develops.

- One-to-one correspondence** Two sets are in one-to-one correspondence if each object in one set has a counterpart in the other set. If the objects in two sets are in one-to-one correspondence, they are equal in number.
- One-to-one principle** The principle that when counting a set of objects, each object must be counted once and once only.
- Onset** The onset of a **syllable** is the consonant, cluster of consonants, or vowel at the beginning of a syllable. The onset of “hat” is “h,” and “st” is the onset of “stair.” See also **rime**.
- Ontogeny** The personal growth of an individual living being from conception. Contrast with **phylogeny**.
- Operant conditioning** A form of conditioning investigated by B. F. Skinner. The training, or shaping, of an animal or human by rewarding him/her for producing the desired behavior (or a close approximation to it) and/or either ignoring or punishing undesirable behaviors in order to stop them. An important form of learning in **behaviorism**, and see also **classical conditioning**.
- Order irrelevance principle** The principle that it does not matter in which order members of a set are counted: if one person starts at the top and works down, she should get the same result as someone who starts at the bottom and works up.
- Ordinality** The numerical principle that states that numbers come in an ordered scale of magnitude: 2 is more than 1, and 3 is more than 2, and as a logical consequence 3 is more than 1.
- Organismic world view** The idea that people are inherently active and continually interacting with the environment, and therefore helping to shape their own development. Piaget’s theory is an example of this world view. See also **mechanistic world view**.
- Organization** A **mnemonic strategy** that works by organizing items into meaningful categories. See **cluster effect**.
- Orthography** A writing system. Orthography is used to describe any aspect of print or, more loosely, spelling.
- Overextension** Extending the meaning of a word too broadly, for example using the word “bird” to refer to birds, airplanes, and hot-air balloons. See also **underextension**.
- Overgeneralization** Creating a new verb by treating a noun as if it were a verb, for example “I am ballereening,” meaning “I am dancing like a ballerina.”
- Overregularization** The name given when a previously learned rule is applied in the wrong situation. For example, a child learning English might say “thiked” rather than “thought” because the child is using the regular past tense rule (attach “-ed” to the end of the verb) rather than the correct exception to the rule (“thought”).

P

- Paired-associate task** A memory test in which participants must remember pairs of unrelated items. For example, the participant is told to link the picture of a house with the picture of an elephant. During the testing phase, they are shown the elephant picture, and their task is to link this to the house. See also **elaboration**.
- Paradigm** A philosophical system of ideas that serves to organize a set or family of scientific theories and associated scientific methods.
- Parallel activity** A type of activity where children play near each other with the same materials, but do not interact much.
- Parental style** The different ways in which parents raise their children. Generally, different styles are measured according to the degrees of parental responsiveness and parental demandingness. See **authoritarian parenting**, **authoritative parenting**, **indulgent parenting**, and **neglectful parenting**.

Passive or submissive victim Passive or submissive victims are individuals who are not aggressive or teasing in their behavior, and who are often cautious, sensitive, and quiet. They usually react to bullying by crying or withdrawing from the situation, often do not have any friends, and have a very negative attitude toward violence and the use of violent means. See **bullying** and compare with **provocative victim**.

Pedagogy Any activity that is specifically designed to teach.

Peer Companion of approximately the same age and developmental level.

Percentile Location of an individual's development or achievement along a percentage scale. For example, if an individual is at the 60th percentile on height, she is taller than 60 percent of her peers.

Performance limitations Limitations that are associated with the task being asked, rather than a deficiency in competence. For example, it can be argued that a child's failure on the **deceptive box task** is due to performance limitations, since the same child can give the correct response when tested using the **posting version of the deceptive box test**.

Perseveration See **response perseveration**.

Personality trait Facet of a person's character that is relatively stable. Examples of personality traits include shyness, **extraversion**, and confidence.

Perspective-taking Young children tend to be **egocentric** and often have difficulty in understanding a situation from someone else's point of view.

Phenomenism Knowledge that is limited to appearances such that, in tasks that involve distinguishing reality from appearance, children report only appearance. See **appearance-reality distinction** and contrast with **realism**.

Phenotype The apparent, observable, measurable characteristics of the individual. Contrast with **genotype**.

Phoneme A set of sounds that are not physically identical to one another, but which speakers of a language treat as equivalent sounds. So whilst the sound "ba" will sound very different if spoken by a man and a woman, English speakers will still perceive both instances as examples of the same phoneme. The phoneme is also the smallest unit of speech that constitutes a change in meaning, for example "rate" and "late" only differ in one phoneme, yet these words have very different meanings.

Phonological skills An awareness of sounds at the phonetic level, being able to detect the individual sounds (or **phonemes**) in words. Phonology is the aspect of language that is concerned with the perception and production of sounds that are used in language. In order for effective communication to occur, children must learn which sounds are important in the language that they hear.

Phylogeny The evolutionary growth and development of a species. Contrast with **ontogeny**.

Play hierarchy A scheme used for coding children's activities, based on social participation and level of play.

Posting version of the deceptive box test A version of the **deceptive box task** where the child posts what she thinks is in a box. See **state change test**, **theory of mind**, and **unexpected transfer test**.

Postnatal development The development of a human individual after he or she is born, particularly during early infancy.

Pragmatic system The cognitive and social skills that enable us to communicate effectively. For example, the abilities involved in **turn-taking**, initiating new topics and conversations, sustaining a dialogue, and repairing a faulty communication are all important aspects of the pragmatic system. See also **pragmatics**.

Pragmatics The communicative side of language, the intentions expressed in utterances as opposed to the actual words being used. For example, "Would you like to sit at the table?" could actually mean "Come and sit down now."

Precocial species Those species of animals where the young are able to locomote almost immediately after birth or hatching. These include ducks, geese, sheep, and horses. The young will often **imprint** on and follow their mother, an instinctive response which has clear survival value for the young. See also **critical period**.

Prenatal development The development of a human individual before he or she is born.

Preoperational stage A stage of development described by Piaget in which children under the age of approximately 7 years are unable to see enough aspects of problems in order to solve them. Preoperational children fail **conservation tasks** and display **animism** in their thinking.

Pretend play “Make-believe play” in which the child may pretend to be other people or act out real-life situations, e.g., playing “mommies and daddies,” or may pretend that one object (e.g., a banana) is another (e.g., telephone). Sometimes called **symbolic play**.

Preterm Born prematurely. A human infant is regarded as preterm if he or she is born before 38 weeks of pregnancy.

Primary caregiver The individual, usually but not always the mother, who satisfies the baby’s biological and psychological needs. See also **monotropy**.

Primary drives Basic needs which include hunger, thirst, and the need for warmth. Bowlby and others have argued that an infant’s need for attachment is also a primary drive.

Procedural skills Applying certain routines or procedures in order to solve certain problems and tasks, such as counting the number of objects in a set.

Profound visual impairment (PVI) An inability to see anything more than shades of light and dark. See also **blindisms** and **severe visual impairment**.

Projective techniques Personality tests which attempt to identify **personality traits** through the use of subjective measures. Examples of these would be asking an individual to write a story, draw a picture, or say what she sees in inkblots. The theory is that the individual expresses aspects of her personality through her writing, drawing, or interpretations.

Propositional thought The ability to express relationships in terms of symbolic (and hence abstract) propositions.

Prosocial behavior Any behavior that is enacted in order to benefit others.

Prosody The intonations, stress, and rhythm of speech that are used to communicate meanings, e.g., “this is correct” becomes a question as opposed to a statement when “correct?” ends in a raised inflection.

Protoconversations Interactions between adults and infants in which the adults tend to vocalize when the infants are not vocalizing, or after the infant has finished vocalizing. Protoconversations may be important precursors to the **turn-taking** observed in early conversations.

Protodeclarative A protodeclarative occurs when an infant uses pointing or looking to direct an adult’s attention toward an object. See also **proto-imperatives**.

Proto-imperative A proto-imperative occurs when an infant points to an object and then alternates her gaze between the object and the adult until she obtains the desired object. See also **protodeclarative**.

Prototypical face The face that is produced when many different faces are averaged. For example, the distance between the eyes on the prototypical face will be the average distance between the eyes of all the faces used.

Provocative victim Provocative victims are individuals who are both anxious and aggressive in their behavior. They often have problems concentrating and they behave in ways that causes irritation and tension around them. They can often be characterized as hyperactive and their behavior often provokes other students, thus resulting in negative reactions from their **peers**. See **bullying** and compare with **passive or submissive victim**.

Proximodistal trend The development of motor control in infancy which is from the center of the body outwards to more peripheral segments – that is, the head, trunk, and pelvic girdle

are brought under control before the elbow, wrist, knee, and ankle joints, which leads to finer control over the hands and fingers. See also **cephalocaudal trend**.

Pseudo-word A nonexistent but pronounceable nonword, such as “tibudo” or “wug,” often used in psychological experiments. Pseudo-words are used to test for spelling, grammar, or other aspects of understanding language where we can be sure that the participants have not heard the “words” before.

Psychoanalysis The theoretical view, first developed by Sigmund Freud, that much of our behavior is determined by unconscious factors. According to this view, the child goes through **psychosexual stages** of development – oral, anal, phallic, latency, and genital.

Psychoanalytic theory Most prominently associated with Sigmund Freud. Freud suggested that there are three main personality structures. The **id** is present in the newborn infant and consists of hidden impulses, emotions, and desires. It demands instant gratification of all its wishes and needs. Since this is impractical, the **ego** develops to act as a practical interface or mediator between reality and the desires of the **id**. The final structure to develop is the **superego**, which is the sense of duty and responsibility – in many ways the conscience. See also **psychosexual stages**.

Psychological tests Instruments for the quantitative assessment of some psychological attribute or attributes of a person. The developmental psychologist will use such testing to measure such things as motor development, motivation, reading ability, or general intelligence.

Psychopathology A psychological imbalance such that the individual has difficulties in functioning in the real world.

Psychosexual stages Freud argued that there were five stages of human development. All but the latency stage are centered around the stimulation of an erogenous zone. The stages develop in the following order: oral (0–1 year), anal (1–3 years), phallic (3–5 years), latency (5 years–adolescence), and genital (adolescence onwards).

Psychosocial stages Stages of development put forward by Erik Erikson. The child goes from the stage of “basic trust” in early infancy to the final stage in adult life of maturity with a sense of integrity and self-worth. There is little empirical evidence for these stages, and it is more a matter of belief than fact (as is the case for **psychoanalytic theory**).

Punishment and obedience orientation This is the first of Kohlberg’s **moral judgment stages** and is very similar to Piaget’s **heteronomous stage**. This stage is characterized by an unquestioning belief that something is wrong if a law or an authority figure prohibits it.

R

Racial prejudice A negative evaluation of someone as a consequence of his or her being in a certain racial or ethnic group.

Reaction formation A term used in **psychoanalytic theory**. The individual may react, often unconsciously, to negative aspects of her personality so that, for example, the person whose upbringing destined her to become a miser may react against this and become generous.

Realism In Piagetian theory, characteristic of children who are **egocentric** and assume that others share their own perspective. Also used to refer to children’s responses in appearance–reality tasks (e.g., in tasks that involve distinguishing appearance from reality, children report only reality). See **appearance–reality distinction** and contrast with **phenomenism**.

Recall After witnessing an event, or learning test items, a participant is asked to describe anything about the event or the test items that he or she can remember, where the event or test items are no longer present. See also **recognition**.

Recapitulation To “go over” and repeat again. The expression “**ontogeny** recapitulates **phylogeny**” refers to the repetition of evolutionary stages in the growth of the fetus and young mammal.

- Recognition** After witnessing an event, or learning test items, a participant is shown a list of items and asked to identify (*recognize*) any that were present during the event or initial learning. See also **recall**.
- Reductionism** The claim that complex behaviors and skills such as language and problem-solving are formed from simpler core processes, such as neural activity and conditioning, and can ultimately be understood in these simpler terms.
- Reflexive vocalizations** The first sounds produced by infants, including cries, coughs, burps, and sneezes.
- Rehearsal** A **mnemonic strategy** that involves the repetition of the items or information that have to be remembered. An example is repeating a telephone number so as not to forget it before dialing.
- Representational ability** The ability to form a mental representation of an event or an object.
- Response perseveration** Repeating a previously learned response usually when it is not appropriate. For example, when infants incorrectly search at location A when making the **A not B error**, they may be repeating the previously successful response to search at A.
- Retinal image size** The size of a visually perceived object on the retina of the eyes. This image will vary depending on the real size of the object and its distance from the observer.
- Retrieval demands** Cognitive demands made when attempting to remember information. Retrieval demands are greatest in **recall** tasks, and easiest in **recognition** tasks where the task provides retrieval cues by showing the items to be recognized.
- Retroactive interference** The finding that information received after an event can interfere with and alter one's memory for the event.
- Reversibility** The ability to imagine a series of steps in both forward and reverse directions. Characteristic of thinking in Piaget's **concrete operations stage**.
- Rhyme** Words rhyme with each other when they share a **rime** – “cat” and “hat” rhyme because they have the **rime** “at” in common.
- Rime** The vowel sound of a **syllable** plus any consonants that follow. The rime of “hat” is “at,” and the rime of “stair” is “air.” See also **onset**.
- Rods and cones** Light-sensitive cells found in the retina of the eye which translate light into electrical signals that are then transferred to the brain so that the image can be interpreted.
- Rooting reflex** The reflex that causes a newborn baby to respond to one of her cheeks being touched by turning her head in that direction. This reflex helps the infant to find a nipple with her mouth.
- Rouge test** A test to examine an infant's self-concept. A small amount of rouge (or some other color) is placed on the infant's nose before she is placed in front of a mirror. If the infant touches her own nose, as opposed to the reflection in the mirror, she is said to have acquired a self-concept.
- Rough-and-tumble play** A friendly type of play that involves play-fighting with a partner.

S

- Savant skills** See **idiots savants**.
- Scaffolding** The process whereby adults structure and simplify a child's environment in order to facilitate his or her learning. Scaffolding may occur in a variety of contexts, for example by pointing out the next piece in a jigsaw puzzle or offering the child a sock rolled down to make it easier to put on.
- Schemas** Mental structures in the child's thinking that provide representations and plans for enacting behaviors. See also **accommodation** and **script**.

- Script** A generalized framework for commonly experienced events or situations, with a stored representation of what one would expect to happen in such situations. An example of an event that would typically have a stored script would be going to a restaurant.
- Secondary drive** A term used in **behaviorism** to refer to the fact that objects can acquire reinforcing properties by being associated with the satisfaction of an individual's **primary drives**. It is thought that many fetishes can be acquired this way.
- Secondary intersubjectivity** Involving both objects and other people in one's interaction with the world. For example, a 9-month-old infant will begin to share the experience of a new object with other people, she may point to the object or make vocalizations in order to direct another's attention toward it. This behavior indicates that the infant understands that both she and another can attend to the same object, and that she can influence and direct another person's attention. See also **intersubjectivity**.
- Second-order analogy** An analogy that requires the use of **crystallized intelligence**. In order to make the connections, one must be able to derive a relationship that is not inherent within the analogy. An example of a second-order analogy is (Bert and Ernie):friendship:: (Romeo and Juliet):love. Note that understanding the analogy requires that the relationships of *Sesame Street*'s Bert and Ernie, and Shakespeare's Romeo and Juliet, be derived: only then does the analogy reduce to "friends are to friendship as lovers are to love."
- Securely attached** Descriptive of a child who finds comfort and consolation in the presence of a parent or caregiver, and who seeks comfort from that person after a separation or other aversive event. Whilst the caregiver is present, the securely attached infant uses him or her as a secure base to explore the environment. See **insecure-avoidant**, **insecure-resistant**, and **strange situation**.
- Selective attention** The ability to allocate attentional resources and to focus on (a) specific topic(s).
- Self-actualization** Fulfillment of needs beyond those deemed necessary for survival. When the need for life, safety, love, and esteem is being met, individuals are free to seek the fulfillment of higher needs, such as pursuing talents and dreams. See also **humanistic theory**.
- Self-concept** One's awareness and evaluation of one's self.
- Self-socialization** The idea that children attend to and imitate same-sex models, and follow sex-appropriate activities, because they realize that this is what a child of their own sex usually does.
- Semantic memory** **Long-term memory** of all of our world knowledge, including concepts, algorithms, definitions of words and the relations between them. The semantic memory for "market," for example, includes the knowledge that it is a place for buying and selling goods.
- Semantic system** A system that categorizes words in relation to their meaning.
- Sensitive period** A period of development, usually early in life, during which the individual is most sensitive to certain types of experience or learning. Refers to a period of time that is more extended than a **critical period**.
- Sensorimotor stage** In Piaget's theory, the first stage of **cognitive development**, whereby thought is based primarily on action and internalized thinking is largely absent. This stage is characteristic of infants from birth to about 2 years old.
- Sequential design** A longitudinal study that examines the development of children from different age **cohorts**. Additionally, a cross-section of ages is also examined in order that any cohort effects may be identified. Sometimes called age-cohort design. See also **cross-sectional design** and **longitudinal design**.
- Severe visual impairment (SVI)** Whilst still having very poor vision, individuals with SVI do have some limited visual perception of form and shape. See also **profound visual impairment**.

- Sex-role stereotypes** Beliefs held about what is most appropriate for one sex or the other.
- Shape constancy** Understanding that an object remains the same shape even though its **retinal image size** changes when it is viewed from different angles. Therefore, when we view a square tilted on one axis, we do not perceive the shape as a rectangle but as a square tilted away from us. See also **size constancy**.
- Short-term memory** **Encoded** events enter the short-term memory first, and can then progress to the **long-term memory**. Short-term memory can typically only hold a limited number of items (about seven) for a short period of time. Also called **working memory**.
- Size constancy** Understanding that an object remains the same size despite its **retinal image size** changing as it moves closer to or away from us. Therefore, when we see a car driving down the road away from us, we do not see it as shrinking despite the fact that its retinal image size decreases. See also **shape constancy**.
- Social cognition** The comprehension of social situations.
- Social contract orientation stage** See **human rights and social welfare morality**.
- Social learning theory** Associated with Albert Bandura. The application of **behaviorism** to social and cognitive learning that emphasizes the importance of **observational learning**, that is, learning by observation and then copying (imitating) the observed acts.
- Social policy** Actions, rules, and laws aimed at solving social problems or attaining social goals, in particular intended to improve existing conditions.
- Social referencing** Infants and young children look to their caregiver for “advice” when faced with a difficult or uncertain situation and seek social cues (such as smiling or frowning) to guide their actions.
- Social signaling devices** Devices such as smiling and crying that signify someone’s emotional state.
- Social system morality** The fourth of Kohlberg’s **moral judgment stages**, also called the **law and order orientation stage**. In this stage individuals recognize that all members of society have intentions and pursue goals, but they understand that rules and laws are necessary in order for society to function and to prevent anarchy. It is therefore necessary for them to always side with whoever is more within the law, even if this causes great regret. Therefore, it is never acceptable to steal since this is against the law; however, one may still feel sympathy for a man who steals in order to save his wife.
- Sociocognitive conflict** A **cognitive conflict** that arises as a result of a social interaction, e.g., two **peers** having a different understanding of a mathematical problem.
- Sociodramatic play** **Pretend play** involving social role-playing in an extended story sequence.
- Socioeconomic status (SES)** A scale that gives an indication of someone’s social class and income bracket.
- Sociometric status** A categorization of children as popular, controversial, rejected, neglected, or average, according to whether they are high or low on positive and negative nominations.
- Sociometry** A picture of the social structure in a group, derived from observation, questionnaire, or interview.
- Software** A computer term referring to the variety and effectiveness of the strategies or programs that allow the computer to use and manipulate information. See also **hardware**.
- Spatial cognition** An understanding of the three-dimensional world and symbols, and that one thing (the symbol or model) can stand for another (the real thing).
- Speech stream** The undifferentiated series of words that are produced when we communicate. In order to understand the meaning conveyed when someone speaks, we must first break the speech stream into the individual words contained within it.
- Speed of processing** The time it takes for the brain to either receive or output information, or the speed with which a mental calculation can be carried out.

s-structure (or surface structure) The **syntax** of a sentence. However, one s-structure can have more than one meaning. In order to understand the intended meaning of a sentence, one must examine the **d-structure**.

Stability versus change The question of whether individuals are stable in the sense of maintaining their rank order across age, e.g., does the bright 2-year-old become a bright 10-year-old?

Stable order principle The principle that number words must be produced in a set order: if you count 1–2–3 on one occasion, you must never then count 3–2–1 on another.

Stage-like changes in development Changes in development that can be categorized into qualitatively different stages, so that a child's abilities will remain relatively stable and then, often suddenly, move up to the next stage. Development of this kind is usually nonreversible; once a child has reached a particular stage, she does not fall back to the previous stage's thinking or behavior. A major characteristic of Piaget's theory of intellectual development.

Stages of moral reasoning See **moral judgment stages**.

Standard deviation Statistical term that indicates the average spread of scores from the mean. A high standard deviation would indicate that there is a large variability within the data. A low standard deviation indicates that there is little variability in the data, i.e., many of the scores have values that are very close to the overall mean.

Standardization The development of a test or procedure by administering it to a large group of individuals in order to develop uniform instructions and group norms. A **standardized test** is one that can be given to children (or adults) to compare their performance with that of others of the same age or background.

Standardized score A score that has been converted to fit a distribution with a given mean and **standard deviation**. Standardized scores make it easy to compare two individuals, since their scores are being converted in the same manner and are therefore relative to each other. **Intelligence tests** use standardized scoring.

Standardized test A test of a psychological characteristic, such as personality, aptitude, or intelligence, that has been **standardized** on a representative sample of the population.

State change test Used in **theory of mind** research. A variation of the **deceptive box task**. The child is shown a Smarties tube or M&Ms box and has to guess what it contains. The box is then opened and the child sees the Smarties/M&Ms being removed and replaced by a pencil. The box is then closed again. The question asked is, "When you first saw the box, before we opened it, what did you think was inside?" Using this method, a much larger percentage of 3- and 4-year-old children give the correct response of "Smarties/M&Ms" (80 percent versus 40 percent in the original deceptive box task). See also **posting version of the deceptive box test** and **unexpected transfer test**.

Still-face procedure This procedure is used to examine how changes to an infant's social surroundings affect his or her behavior. Mothers are asked not to respond to their infants as they normally would, but to remain silent and expressionless. Infants respond to this situation with signs of distress, they gaze warily at their mother, give brief smiles followed by sobs, look away for long periods of time, and eventually become very withdrawn and distressed.

Strange situation Measure, devised by Ainsworth, of the level of attachment a child has with his or her parent. It is typically conducted when the infant is between 1 and 2 years of age and assesses infants' responses to separation from, and subsequent reunion with, their mother, and their reactions to an unfamiliar woman (the so-called stranger). See also **insecure-avoidant**, **insecure-resistant**, and **securely attached**.

Stranger anxiety Unhappiness felt by many infants when they encounter an unfamiliar person. Stranger anxiety begins to emerge at around 7 months of age.

- Structured observation** An **observational study** in which the **independent variable** is systematically controlled and varied, and the investigator then observes the child's behavior. Similar to an experiment but the degree of control is less precise than in a laboratory setting.
- Subitizing** The ability to perceive directly a small number of items without consciously counting them or using another form of calculation. This ability only applies to very small numbers.
- Subjective contours** When the corners of an object only are presented, the remaining contours are "filled in" in order that the complete shape can be perceived. The lines that are "filled in" are referred to as subjective contours since they are not really there.
- Suggestibility** A child's (or adult's) tendency to change his or her memories and beliefs, often in response to interrogation. This is likely to result in inaccurate recall of events.
- Superego** In Freud's theory, a collection of ideals, an individual's morality. This is what we refer to as our conscience and it is often in conflict with our **id**. See also **defense mechanisms** and **ego**.
- Sure Start** See **Head Start**.
- Syllabary** The name given to a language that relies heavily on **syllables** for meaning.
- Syllable** The smallest unit of a word whose pronunciation forms a rhythmic break when spoken.
- Syllogism** Comprises two statements (called premises) and a conclusion that is derived from the previous statements. For example: If A is a subset of B, and B is a subset of C, A must also be a subset of C.
- Symbolic play** See **pretend play**.
- Synapse** The connections between **neurons** which enable them to pass messages.
- Synaptogenesis** The building of connections (**synapses**) between nerve cells.
- Syntactic skills** An understanding of the basic grammar of a language, understanding which order to place words in a sentence.
- Syntax** The manner in which words and parts of words are related to one another to produce grammatical sentences: the production of sentences is governed by grammatical structures and rules.
- Synthetic models** Naive and immature models or theories that are often replaced by mature models that better represent reality.

T

- Theory of development** A scheme or system of ideas that is based on evidence and attempts to explain, describe, and predict behavior and development.
- Theory of mind** The understanding that different people may have different emotions, feelings, thoughts, and beliefs from one's own.
- Time sampling** An **observational study** that records an individual's behavior at frequent intervals of time.
- Top-down structures** Where prior knowledge and experience help us to make sense of what we experience. As an example, **scripts** are top-down structures in that they lead to the automatic generation of expectations about the structure of an event we will experience in the future. Compare with **bottom-up structures**.
- Transitive inference** The relation between two (or more) premises (e.g., $A > B$, $B > C$) that leads to an inference that is logically necessary ($A > C$). See also **transitivity task**.
- Transitivity task** A task that examines a person's ability to infer a relationship between two or more items that usually cannot be directly compared. For example, the relationship between A and D can be calculated if one knows that $A > B$, $B > C$, and $C > D$, namely, that $A > D$. See also **syllogism**.
- Transnatal learning** Learning that occurs during the **prenatal** period which is remembered during the **postnatal** period.

Trimester A period of three months. The course of human pregnancy is divided into three trimesters.

Turn-taking The understanding that during a communicative exchange each participant takes turns to communicate in an alternating fashion.

U

Underextension Extending the meaning of a word to too few instances, as when a child restricts his or her use of a word like “duck” to situations in which the child is playing with a toy while in the bath, therefore failing to refer to the animals at the park as “ducks.” See also **overextension**.

Unexpected transfer test A third-person version of the **deceptive box task** as a measure of **theory of mind**. In this test a child sees “Maxi” hide a chocolate bar and then leave the room. Maxi’s mother then enters the room and moves the chocolate bar from the cupboard to the fridge. The child is then asked where Maxi will search for the chocolate when he returns. Those children who fail the **deceptive box task** are more likely to fail this test also and say that Maxi will search in the fridge. See also **posting version of the deceptive box test** and **state change test**.

Universal counting principles These are a set of principles that must be obeyed in order for our number system to work. These principles are the **abstraction principle**, the **last-number-counted principle**, the **one-to-one principle**, the **order irrelevance principle**, and the **stable order principle**.

U-shaped functions Behavior where ability is initially very good, then decreases, and then increases again follows a U-shaped function of development. An inverted U-shaped function follows the opposite trend, initially poor, then getting better, and then becoming poor again.

V

Vestibular system The system that controls a person’s sense of balance. It is found within the ear.

Violation of expectation technique This technique is used to examine whether infants have any expectations about the world around them. They are typically familiarized with an event sequence, and then presented with two test trials that are variants on the original, one involving a possible event and the other involving an impossible event. If the infants look longer at the impossible event, this is taken as evidence that they have detected the impossibility of the event sequence.

Visual accommodation The ability to focus on objects irrespective of their distance from the eye. Therefore, as an object moves closer toward us, it does not appear to go in and out of focus.

Visual acuity The ability to make fine discriminations between the elements in the visual array.

Visual cliff A piece of apparatus used to study depth perception in infants. The apparatus consists of a glass table with a checkerboard pattern beneath it. At one half of the table the checkerboard pattern is directly below the glass (the “solid” half). At the other half the checkerboard is several feet below the glass top (the “deep” half). Infants are placed on the “solid” half and encouraged by their mothers to crawl to the end of the “deep” half. Infants crawl to the edge of the “solid” half, but usually refuse to crawl on to the “deep” half (although in reality it would be perfectly safe to do so). This indicates that infants perceive (and fear) depth from visual information alone.

Visual illusion A visual display that is either ambiguous in nature, or that “tricks” the brain into believing something about the display that is not true.

Visual preference technique This technique is used to examine whether infants have preferences for certain stimuli. Infants are shown two objects (usually 2-D pictures) side by side, and the amount of time they spend looking at each one is then compared.

W

Wing's triad of impairments Impairments of (1) social relationships, (2) communication, and (3) imagination characteristic of **autistic** behavior.

Working memory **Short-term memory** store in which mental operations such as **rehearsal** and categorization take place.

Z

Zeitgeist The thought or feeling peculiar to a generation or period – as in “the prevailing *Zeitgeist*” or “the spirit of the age.”

Zone of proximal development The difference between what children can do on their own, and what they can do under adult guidance or in collaboration with more able **peers**.