

UNIT 12: DEVELOPMENTAL

QUESTION #12.1: What is human development?

Developmental psychology is the branch concerned with the changes in behavior over life cycle. In many ways, the individual's growth and development follows an orderly sequence, but one influenced by both heredity and environment. Because the term "maturation" can imply physical, emotional, intellectual, and interpersonal development (as well as wise decision making), it is best to avoid using that term and search for one that is more precise.

Heredity refers to the characteristics of the organism **determined by the genes** received from the biological parents. At the moment of conception, when the sperm unites with the egg, the heredity of the individual is fixed for a lifetime. Anything that happens to the individual after that time is not the fault or the credit of heredity.

Sir Francis **Galton**, 130 years ago, argued that heredity was the main determinant of human behavior. Modern sociobiologists also echo that view, claiming that everything from sexual behavior to patterns of stylized **aggression** (behavior which intends to harm another) are dictated by millennia of natural selection. Some **ethologists (scientists who study animals in their natural habitat)** argue that many species have evolved complex instincts to govern important behaviors. One ethologist, Konrad **Lorenz**, noted that most species which are naturally well armed with claws (e.g., lions) or horns (e.g., elk) have a stylized pattern of male combat to determine who will have mating rights. The loser knows when to give up, and the victor spares the life of the loser. Those species that are not naturally well armed (e.g., doves, humans) have not evolved natural limits on intraspecies aggression, do not know when to stop, and may fight to the death.

Most psychologists would say that the role of heredity is limited to influences on anatomical and glandular structure. Humans have several inherited **reflexes** (simple behaviors), but few if any true **instincts** (complex, inherited behaviors). Obviously, physical characteristics such as height and weight and longevity are influenced by genes. Genetics are one influence on measures of intelligence, such as IQ, as well as mental disorders such as schizophrenia and bipolar.

Temperament refers to the inherited core of personality. Several trait and typology theorists have suggested that personality differences in adults can be traced back to temperament. Eysenck contended that the introvert / extravert distinction was based upon inherited levels of cortical excitation. The introvert is blessed (or cursed) with a high level of cortical excitation, and therefore generating enough internal stimulation, and does not need the presence of other people. Indeed, the very conversation of others, and their demand for attention could be perceived as sensory overload. The extravert has a low level of cortical excitation and needs the presence of others to rescue her from the boredom of solitude.

Environment is the cumulative influence of the outside world: experience and learning. Starting with **Watson** and **Skinner**, the **Behaviorists** have emphasized the environment as the main factor in accounting for human development and differences. Watson boasted that he could take any healthy newborn and condition him to be a beggar, thief or saint. Skinner thought that a perfect society could be constructed with the technology of positive reinforcement. Most psychologists are somewhere between the extremes of Galton (heredity) and Watson (environment) noting that both factors influence adult behavior, and we can never be certain exactly in what proportion.

One research design very useful in the study of the relative impact of heredity and environment is the investigation of identical twins. **Twins** are siblings that share the same intra-uterine environment, and are born at the same time. Fraternal twins are the product of two separately fertilized ova (sperm-egg) combinations. They have the same mother and father, so they have some genetic similarity, but no greater than that of any full siblings born in different years. Identical twins are the result of a single sperm-egg combination, a fertilized ovum that split into two individuals. Identical twins much have the same genes, and therefore must be of the same gender.

<i>Possible relationship between two sibings</i>				
		Same fertilized egg?		
		Yes	No	
T I M E	Same time	Identical twins	Fraternal twins	
	Different times	<i>Impossible</i>	Siblings with different birth order	

Some reporters and talk show hosts have tracked down a pair of identical twins separated early in life, and have been amazed at the similarities: same career, same hobbies, married women of the same name, preferred a dog of the same breed. The inference made was that heredity was an over-whelming determinant of behavior. This type of research is a case study of the worst kind: an example selected because it was so amazing.

Research on identical twins separated at birth	
<i>Researcher(s)</i>	Reporters, talk show hosts
<i>Subjects</i>	One pair of identical twins separated early in life
<i>Type of research</i>	Case study
<i>Independent Variable</i>	Environment: raised in different families
<i>Factors held Constant</i>	Heredity
<i>Dependent Variable</i>	Vocational choices, preferred hobbies, breed of dog chosen, name of spouse
<i>Results</i>	Amazing similarities reported
<i>Conclusion</i>	Heredity is important.

A survey would have to quantify how frequent one of these patterns of similarity was in pairs of identical twins, and then compare that with the frequency of that similarity in unrelated individuals.

Research design required to demonstrate a correlation between heredity and careers			
		Similar career chosen?	
		Yes	No
R E L A T I O N S H I P	Identical twins reared apart	A	B
	Unrelated pairs of individuals reared apart	C	D

Even if the talk show had contained a dozen examples of identical twins separated at birth who had the same amazing similarity, that would prove nothing (except that the reporters had looked very hard to find twelve examples for cell A). Good sampling does not just seek those subjects who fit the confirmation bias of the hypothesized trend.

Although the Behaviorists and the Sociobiologists disagree about heredity and environment, they are in agreement about one thing. They are both examples of extreme **determinism, the view that human behavior**

and choice are dictated by causes (e.g., heredity and/or environment) beyond a person's own free will. This debate between free will and determinism predates modern psychology and goes back to philosophy and theology. When you choose to do something, was your choice really free? or was it predestined by forces beyond your control: your genes, your childhood, your society, God or the Devil? In the 16th century theologians such as the Protestant Calvin and the Catholic Jansen argued that humans are so depraved that they do not even have the free will to accept God's grace: those who are saved do not choose God, He chose them. Those who are chosen are irresistibly drawn to God. Theologically, **the free will doctrine was argued by** the Dutch Protestant Arminius and the Catholic Jesuits. In psychology, the **Humanistic** (e.g., Allport, Maslow and Rogers) and **Cognitive** theorists (e.g., Seligman) have been the great defenders of free will. Perhaps Adler was the most eloquent: "It is not your heredity or your environment that makes you what you are; it is your decisions about your heredity and environment that make you what you are."

One way that heredity and environment interact is by the process of **imprinting during critical periods**. A critical period is a genetically pre-determined developmental phase in which the organism will be extremely sensitive to stimuli from the environment. The particular stimuli provided at that point by the environment will have a major and permanent impact upon the subject's behavior.

One example of imprinting comes from **ethologist Konrad Lorenz**. He observed that when waterfowl hatched, they immediately followed the first large moving object they saw (the mother). If she waddled somewhere on land, the ducklings followed in a row. If she went into the water, the ducklings also followed, swimming by instinct.

STIMULUS		ORGANISM		RESPONSE	
=====		=====		=====	
=	=	=	=	=	=
= large	=	=	=	=	=
= moving	=====>=	duckling	=====>=	follows	=
= object	=	=	=	=	=
= (mother duck)=	=	=	=	=	=
=====		=====		=====	

Lorenz decided to do an experiment. He put the duck eggs in an incubator to hatch. The first large moving object that the newly hatched ducklings saw was Lorenz himself, and they tried to follow him around, as if he were their mother. He then repeated the experiment with another stimulus: a large box on a toy train going on a track around the incubator. The ducklings tried to go around in circles, following the box on the train.

Imprinting right after hatching might also explain why certain fish return to the same spawning grounds. When chickens hatch, the first fourteen days are a critical period for mastering the eye-beak coordination of pecking. Chicks raised in the dark for the first fourteen days never become very good at scratching and pecking.

<i>Research on imprinting</i>	
<i>Researcher(s)</i>	Lorenz
<i>Subjects</i>	Ducklings
<i>Type of research</i>	Experiment
<i>Independent Variable</i>	First large moving object seen after hatching
<i>Factors held Constant</i>	Species, age
<i>Dependent Variable</i>	How the ducklings respond to the object.
<i>Results</i>	The ducklings followed the first large moving object that they saw after hatching.
<i>Conclusion</i>	Just after hatching is a critical period for ducklings. The first large moving object becomes imprinted as the mother.

Imprinting can also occur as a young adult. Some species of birds mate for life. When the bird is in the critical period of mate selection, the very first mate it has becomes imprinted. After that point, no other bird will be considered an acceptable mate. Even if the original mate dies, the bird will not seek or accept a new mate.

Imprinting also occurs in mammals. Puppies and kittens raised without human contact for the first six weeks of life never become very good pets. The **Harlows** found that monkeys raised alone for the first six months miss the critical period for developing social skills. When later put in a cage with other monkeys, they will either cower with fear before the other monkeys or else behave very aggressively.

One example of a critical period for humans may be the first eight years of life in terms of language acquisition. A child of any ethnicity can learn any human language and speak it like a native if the learning takes place young enough. The older someone is when she tries to master a new language, the more difficult it will be to articulate the phonemes and comprehend the grammar. When three generation families of immigrants come to the U.S., it is the children who pick up English first, and have the most thorough knowledge of it. The parents may pick up enough English to get by, but may remain more comfortable in using their first language at home. The grandparents will have the hardest time with the new language. In financial and legal activities, such as the purchase of an automobile, the children might have to play the key role of translator for the rest of the family.

Case Study: Mr. B., 53, grew up on a ranch where most of the workers were from Mexico and spoke Spanish. When he took Spanish in high school to learn the spelling and vocabulary, his teachers marveled at his "near native" pronunciation. He also studied two years of Russian in high school, and German at the university. He remembers just a few words and phrases from these languages, but when he is traveling and

hears German or Russian spoken, he cannot resist uttering a sentence of greeting. The usual reply he receives is "Do you speak English?" His lack of mastery of German and Russian phonemes is evident from the very first words he speaks. But when he travels in Spain or Latin America, and greets the locals in Spanish, the first question they ask is "Are you from Mexico"?

QUESTION #12.2: What are the main features of early human development?

Inside of the womb of the mother, the fertilized ovum is officially known as a fetus from eight weeks after conception until birth. About four weeks after pregnancy begins a critical period for the development of the brain (even though many women do not yet know that they are pregnant at this time). The head and brain grow faster than the rest of the body. By five months, the fetus is about half head. At birth, a quarter of the length of the newborn is head. By age six, the brain has attained 90 percent of its eventual size. Although people at any age can form new neural connections, it is especially easy in these early years. Therefore, conditions such as exposure to a harmful virus, toxic chemical, cocaine, alcohol, or nicotine occurring in pregnancy might permanently stunt the development of the brain. Even malnutrition in the first six years of life might have this impact, leading to retardation.

Congenital problems are those that originate in the fetal period. Like inherited disorders, congenital problems are present at birth. Unlike inherited disorders, congenital problems were not caused by a faulty genetic blueprint for development, but by a faulty execution of that blueprint during the fetal stage due to some problem within the intra-uterine environment.

The **neonate** (adjective, neonatal) is a **newborn** baby. The newborn has several inherited, simple **reflexes**, such as the rooting reflex (turning its head toward a touch and sucking).

Much motor (muscular) development must wait until the proper **critical period** has been reached before it can be learned. Most children cannot be trained to walk, talk, or use the toilet before their little bodies are ready. In some cultures, babies are swaddled (tied to a board for easier carrying). Even though this means that the babies cannot exercise their legs, this does not seem to be a permanent disadvantage when it comes time for the child to walk. Similarly, some cultures do not emphasize diapers or early toilet training: toddlers are allowed to wander around naked. By the time they are three, they are controlling their bowels and bladders (most of the time) and going where their older siblings go to do those things.

Emotional development must also wait for the infant's readiness. The neonate can express excitement and react to pain. He can smile, but it is not clear what emotion is involved subjectively. After about five months, anger and sadness can be identified. A couple months later, fear and shyness are possible. More complex emotions such as contempt, guilt, and real affection for other children might have to wait until the second year of life.

<i>Types of disorders</i>				
		Problem present at birth?		
		Yes	No	
D U E T O G E N E T I C S	YES	Hereditary	Hereditary	
	NO	Congenital	Environmental	

Two things that parents can do for newborns is breast feeding and intellectual stimulation. Many surveys and experiments have confirmed that breast fed babies have a number of behavioral differences compared with those fed bottled formula (e.g., lower heart rate, lower irritability).

STIMULUS		ORGANISM		RESPONSE
=====		=====		=====
=	=	=	=	=
= breast	=	=	=	= lower level of=
= feeding	=====>=	neonate	=====>=	irritability =
=	=	=	=	=
=	=	=	=	=
=====		=====		=====

Mental stimulation seems to have short term and long term benefits for the infant. In one famous experiment done with baby rats, they were separated into two different cages. One cage was bare, just the wire enclosure and the tube for water and the dispenser for the food pellets. The other cage was an "enriched" environment with designs on the wall and equipment for the rats to run or climb on. When the brains of the two groups were studied, the group exposed to the enriched environment had significantly greater growth in the cortical areas.

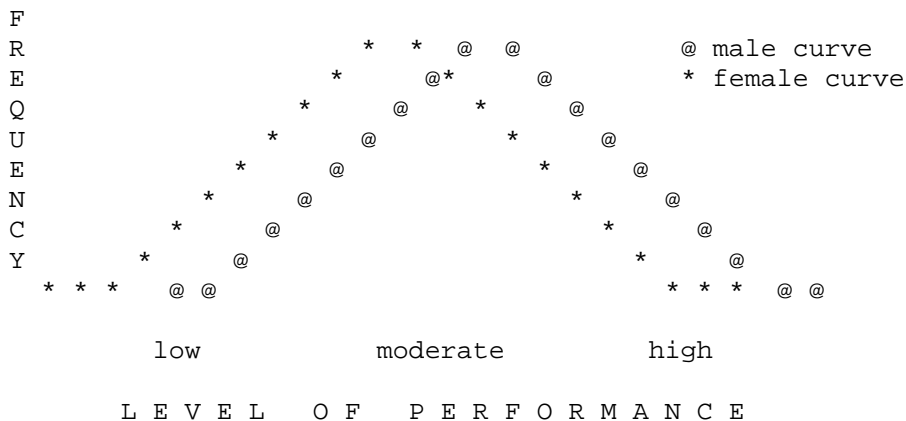
Research on	
<i>Researcher(s)</i>	Rosenzweig and Krech
<i>Subjects</i>	Rats
<i>Type of research</i>	Experiment
<i>Independent Variable</i>	Decorations and equipment in the cages
<i>Factors held Constant</i>	Same age, litter
<i>Dependent Variable</i>	Growth of cortical tissue in the brain
<i>Results</i>	The rats in the enriched environment had more cortical growth
<i>Ethical Considerations</i>	The rats had to be killed in order for their brains to be studied.
<i>Conclusion</i>	The enriched environment stimulated brain growth.

Babies also need comforting and nurturing. A famous study which indicated this was performed by Harry and Margaret **Harlow**, who took a baby **monkey**, and raised it in a cage separated from its natural mother. The Harlows did put two **surrogate mothers** into the cage. One was made out of wire, and had a feeding apparatus for dispensing milk. The other had a soft cloth covering and a friendlier looking face. Except when it was feeding, the baby monkey spent most of its time with the soft mother, especially if after becoming frightened.

Research on infant attachment	
<i>Researcher(s)</i>	Harlow & Harlow
<i>Subjects</i>	Baby monkeys
<i>Type of research</i>	Case studies
<i>Independent Variable</i>	Two "surrogate mothers" were provided: a wire one with a milk bottle, and a soft cloth one with a friendly face
<i>Factors held Constant</i>	Same species, age
<i>Dependent Variable</i>	Where the monkeys went when frightened
<i>Results</i>	The monkeys went to the soft mother
<i>Ethical Considerations</i>	The monkeys had to be separated from their natural mothers
<i>Conclusion</i>	Babies need comforting as well as feeding.

Different styles of parenting exist. The **authoritarian** emphasizes rules and the child's responsibility. The **permissive** approach, common among middle class Americans over the past fifty years, emphasizes the child's rights. (Permissive childrearing was endorsed around 1950 by pediatrician Benjamin Spock, Carl Rogers, and Erik Erikson.) A middle approach, sometimes known as the **authoritative**, focuses on reasoning with the child and building a higher sense of morals and duty. Whatever style of parenting is used by the parents, consistency and love seem to be important for it to work.

<i>Comparison of parenting styles</i>			
<i>Parenting style</i>	<i>Level of emotional support</i>	<i>Emphasis is on</i>	<i>Effectiveness</i>
<i>Authoritarian</i>	Low	Child's duties, limits; punitive	Children tend to be withdrawn or hostile
<i>Permissive</i>	High	Child's rights	Children tend to have low self-control
<i>Authoritative</i>	High	Goals, reasoning, independence	Most children develop social skills, independence
<i>Uninvolved</i>	Low	Provision of material things; emotional detachment	Children tend to be apathetic or aggressive



The existence of male/female differences becomes apparent in early childhood. The older children are, the more likely they are to prefer to spend time with peers of the same gender. Boys do tend to demonstrate more spatial and mathematical aptitude, and display more aggressive and socially dominant behaviors. Girls are less likely to have language deficits, and more likely to report being more concerned about the feelings of others. However, it is important to note that each of these dependent variables shows a bell curve distribution across both genders: a few score very low, a few score very high, but most score toward the middle. This means that although there may be significant differences between the groups when looking at large sample sizes, the overlap between the groups is great. Therefore, some girls

may be higher than the boys' norm, and some boys may be lower than the norm for girls. Also, it is not clear if these differences are really genetic, or merely reflect the fact that the subjects grew up in a culture which emphasizes sex role differences in many ways.

Some of the important disorders of childhood are pica (the craving for unnatural foods, such as paint chips), **dyslexia** (an inversion of letters which makes it difficult to read), **enuresis** (persistent bedwetting beyond the toddler stage), and sibling rivalry (conflicts with brothers and sisters). Most of these disorders do not last past childhood, and can be dealt with through a variety of interventions.

For example, enuresis can be treated through medication (e.g., imipramine, which just happens to be an anti-depressant, but it is prescribed for its side effect of drying out the individual). Enuresis can also be dealt with using a behavioral technique that conditions the child to awaken when he feels a full bladder, just before urination begins. The child sleeps on a special pad that will sound a loud bell when it gets wet. The child learns to associate the full bladder with waking up, and after acquisition he awakens just before urination, and can walk to the bathroom.

<i>(neutral</i>	<i>(unconditioned)</i>	<i>(organism)</i>	<i>(response)</i>
<i>stimulus)</i>	<i>stimulus)</i>	<i>[PASSIVE]</i>	<i>(elicited)</i>

FULL BLADDER --> BELL -----> CHILD -----> WAKE UP

after acquisition of new reflex

<i>(conditioned</i>	<i>(organism)</i>	<i>(response)</i>
<i>stimulus)</i>	<i>[PASSIVE]</i>	<i>(elicited)</i>

FULL BLADDER -----> CHILD -----> WAKE UP

Hyperactivity is characterized by a limited attention span (ADD, ADHD). This is more widespread in the U.S. than in other countries, and more commonly found in boys than girls. The exact cause is uncertain, but a physiological factor is at least predisposing, and probably principal. Medication can be used to stimulate the parts of the brain that allow the child to focus. One controversial area of the current DSM is that it contains adult ADHD. The most widely used treatment is the SSRI anti-depressants (e.g., Prozac).

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DISORDER: attention deficit hyperactivity disorder (ADHD)

OLDER TERMS: attention deficit disorder (ADD), hyperactivity

PREVALENCE: 2 - 15 percent, more common among males

SYMPTOMS: distractibility, inability to follow instructions, aimless activity

AGE OF ONSET: preschool or elementary school

CAUSES: there is at least a biological predisposition

TREATMENT: medication (e.g., Ritalin, Pemoline, Concerta)

= = = = =

Tourette Syndrome involves irresistible movements (known as tics) and making sounds. It is relatively rare, but is found predominantly in boys. It is usually controlled with medication.

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DISORDER: Tourette's Syndrome

PREVALENCE: rare, but more often among males

SYMPTOMS: uncontrollable recurring movements (tics) and vocal patterns (grunts, clicks, obscenities)

AGE OF ONSET: preschool or elementary school

TREATMENT: anti-psychotic medications (e.g., Haldol), cognitive-behavioral therapy

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Perhaps the most severe childhood mental disorder is autism. **Autism is a refusal to interact socially.** The individual withdraws into various forms of self-stimulation. Parents of autistics frequently report that the baby never did seem to want to be held, talked to or played with. Under current classification, **Asperger** syndrome is a term given to high functioning autistics.

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DISORDER: autism

PREVALENCE: rare

SYMPTOMS: extreme social withdrawal, self-stimulation, maintenance of order

AGE OF ONSET: earliest childhood

CAUSES: genetics or prenatal development

TREATMENT: behavior modification to control more extreme behaviors

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Puberty is a biological event: the child gets the adult reproductive system and secondary sexual characteristics. **Adolescence is the psychosocial period begun by the biological event of puberty, lasting until the full assumption of adult roles.** Until about a hundred years ago, most children in most of the world passed right into adulthood without this adolescent liminal period. The female **menarche** (first menstrual period) occurred around age 15, and the girl was married, working (or became a nun) within a few years. Over the course of the 20th century, the developed countries saw that better nutrition led to earlier and earlier menarche (age 13), yet the median age for marriage approached the mid-20s. Both boys and girls required more years of formal education before they could assume financial independence.

Case Study: Ms. T, born in 1899 in Italy, immigrated to California with her family in 1902. Her father worked in a tannery, while the mother raised five children. Italian was the only language spoken at home, and by some of the neighbors. Ms. T remained at home, helping to take care of younger siblings, until she entered the public schools at age 9. At age 16 she graduated from the 8th grade and got her first job in a candy store. Two years later, with the U.S. entry into World War I, she got a job in an aircraft factory, working long hours but earning good money. Three years later she got married to a farmer, another immigrant who had started school late and only finished the 8th grade and then went right to work. Neither thought of themselves as particularly deprived by their childhood experiences, regarding it as the norm for immigrant Americans at that time.

Case Study: Mr. S, born in 1941 in rural Mexico, was the sixth child in a family of eleven. His siblings always regarded him as the most articulate, ambitious and charming. After his father died when he was 12, he became a discipline problem. He did not want to follow the directions from his older brothers or mother. When she would beat him with a riding crop, he would just turn around and say, "You can't hit as hard as daddy could." He ran away just after turning 13, and was gone for a year. When he returned with his pockets full of money, he boasted that he had been to Veracruz (several hundred miles away) where he had cut sugar cane: getting a man's wage for a man's work. His experience of early adulthood was not unusual for his generation. An older brother had married at age 15, and a younger sister ran away at age 14 to avoid marriage to an unwanted suitor.

Many tribal cultures have rites of passage: designated rituals that indicate to the child that he is no longer a child (and must assume an adult role within the society) and to the larger society that the individual is no longer to be regarded as a child. Among the Australian Aborigines, male initiation involved subincision, a painful genital mutilation. On some Polynesian islands, this might involve mastering certain dances, and being tattooed. For African tribes it could mean circumcision and aesthetic scarring of other parts of the body. Among the North American Indians, male initiation involved tests of strength, wit and bravery. In Melanesia young males confronted tasks such as bungee jumping or hunting the heads of enemies.

For most of the 20th century, American adolescence roughly corresponded with the teen years. By age 20 most boys had joined the army or gotten a job, and most girls were working or had gotten married. One of the problems in American culture today is that there is not a clear cut end point to adolescence, because the assumption of adult roles is varied and gradual. In most places, American teens can drive at and get a job at 16; vote, get tattoos and purchase cigarettes (legally) at 18; gamble and drink (legally) at 21. Drug activity, sex, or having a baby are sometimes seen as a declaration of being grown up. Financial independence may occur at different ages, dependent upon social class and family structure.

One of the current challenges adolescence is that the adult body comes before the adult roles (or the wisdom in how to deal with greater strength and freedom). It is not just raging hormones, but the entire limbic system (which intensifies the emotions) develops faster than does the frontal lobe of the cerebrum (which is supposed to control emotions).

QUESTION #12.3: What is gerontology?

After adolescence, the age demarcations are less clearcut. Biological events do not arrive at a uniform age. For example, **menopause** is the end of female sexual fertility, and usually takes place between the ages of 40 and 55. This can be a time of mood swings for some women, primarily due to hormonal shifts. Hormone replacement therapy, as well as anti-depressant medication, can stabilize menopausal moods. There is no comparable male menopause, although some men may attempt to use that as an excuse to justify their bad behavior.

Senescence is old age. There is no universally agreed upon definition of when old age begins, although somewhere between the ages of 60 to 66 is used by many governments in determining eligibility for benefits such as pensions and medical coverage. In the developing nations of the southern hemisphere, low life expectancy and high birth rates mean that only 2 or 3 percent of the population is in the aged range. In developed countries the number and proportion of aged is increasing. In 1900, only 4 percent of the U.S. population was over age 65, by mid-century it was 8%, and by the century's end it was 12%. Now for the first time, there are more Americans over age 65 than there are in the nation's high schools. In Japan and some European nations, the proportion of aged is approaching 20% of the population. The proportion could rise as high as one in four Americans by 2050, depending upon trends in life expectancy, birth rate, and immigration. So far, the gender differential in life expectancies has meant that women outnumber men about 3 to 2 at age 65, 2 to 1 at age 75, and 3 to 1 at age 85. Most aged men in the U.S. are still married, but most aged women are widows.

The adjective "**senile**" implies some kind of problematic aging (such as **senile dementia**). It is important to view aging as a normal process of life, perhaps involving inevitable declines in measures such as physical strength, endurance, and sensory acuity. However, old age itself should not be viewed as a disease, but as a period of time in which there may be greater vulnerability to certain diseases, physical

and mental. To assume that most old people are confused by dementia would be an example of ageism (unfavorable stereotypes about the aged). Less than ten percent of people over age 65 have clinically relevant dementia. (Indeed, the incidence of depression in this age group is at least double that of dementia.) We should not assume that all, or even most, aged drivers are incompetent, but the incidence of difficulty in driving may be high enough after age 70 or 80 to call for required driving tests for license renewal.

The branch of medicine devoted to treating patients in later life is known as geriatrics. **Gerontology is the study of old age.** Most gerontologists received their scientific training in a discipline such as biology, psychology, or sociology before specializing in gerontology by focusing on aging as a content area.

One of the main challenges in any branch of psychology is how to obtain the best research methodology given the limitations of the content area. In gerontology, the problem of selecting the appropriate research design centers around the difficulty posed by the concept of cohort. **A cohort is composed by individuals who were born over a certain range of time.** Usually, a cohort is narrower (covering perhaps a ten year range) than a generation (which may be 25 years). The problem posed to research is that each cohort is unique, due to its particular experiences of the interaction of the course of human lives with the course of history.

For example, the cohort born around 1920 faced a number of early disadvantages. There was a higher than normal proportion born with birth defects (perhaps due to the flu pandemic of 1918-1919). This cohort entered the workforce in the late 1930s, when the U.S. economy was still sluggish. This was the only U.S. cohort (with the possible exception of those born around 1840) where most of the males saw military service and combat. But then some advantages became evident. This was the first cohort in which a large proportion went on to college (making use of the G.I. Bill benefits) but as adult veterans, not as adolescents. This cohort was poised to take advantage of the prosperity and homebuilding boom of the 1950s, but too old to participate in the sexual revolution of the late 1960s. As we look at people in their 80s and 90s today, we see not only the effects of aging, but the mark of that cohort's unique experience in history.

Case Study: Mr. Z, was born in 1920 in New Jersey. He married at age 19 to a local girl, and then moved to California in 1942 to work in a booming defense related industry, but was eventually drafted. After the war, he returned home to find his wife living with another man. He got a divorce, but was saddled with alimony and child support payments that took most of his paycheck. He married again in 1948, and had a second family. They got a large piece of land, and he was handy with tools, so he built a very large, elegant home, far beyond the hopes of the typical factory worker (in which he worked the night shift). He regrets the trauma and expense of his first marriage, but is very satisfied with his second marriage, his children, and career. He thinks that his life before 1948 was hell, and after 1948 heaven. He is sorry that his own children and grandchildren, who have college educations and two

income households cannot purchase a home as nice as he was able to have with a high school education, factory job, and one paycheck household.

One frequently used research design to study human development is the **cross sectional** design. A cross sectional design employs separate groups. In studying children, we could achieve this by going to an elementary school and looking at first graders (for a group of six year olds) and fifth graders (for a group of ten year olds). In general, we could say that both groups come from the same cohort, because a four year difference is not that great in most cases. However, when we are studying aging, a cross sectional design will end up with separate groups who come from different cohorts.

cross sectional study done in 2010: separate groups

group 1	group 2	group 3
=====	=====	=====
=	=	=
= 20 year olds=	=50 year olds=	= 80 year olds =
=	=	=
= born 1990 =	= born 1960 =	= born 1930 =
=	=	=
=====	=====	=====

design problem: confounding variables due to different historical factors influencing different groups.

Suppose we want to discover if attitudes about pre-marital sex differ across the life cycle. We go down to the local senior citizen center and get a group of 80 year olds (born in the 1930s). We go down to the local community college to get a sample of 20 year olds. We go down to a health club and look for an exercise class for middle aged people for some 50 year olds. (Already, you might be wondering if these three different locations might end up getting people who differ on so many other variables, that a comparison just based upon age will be difficult.) We ask all the subjects in the sample the same question.

"In general, do you think it is wrong or not wrong for a man and a woman to have sexual relations if they are not married to each other?"

We find that the majority of the older cohort says that it is wrong, and a majority of the younger cohorts say that it is not wrong. Should we infer that this attitude difference is due to the natural process of aging and going through different social roles? One confounding variable is that these three different age groups have come from three different cohorts, and therefore, these attitude differences may tell us more about unique historical periods rather than a universal process of aging. The 50 year olds born in 1960 grew up during the height of the sexual revolution (just after the widespread distribution of the pill, and the legalization of abortion), and just before the discovery of AIDS. Those "Baby Boomers" may be the sexiest cohort ever.

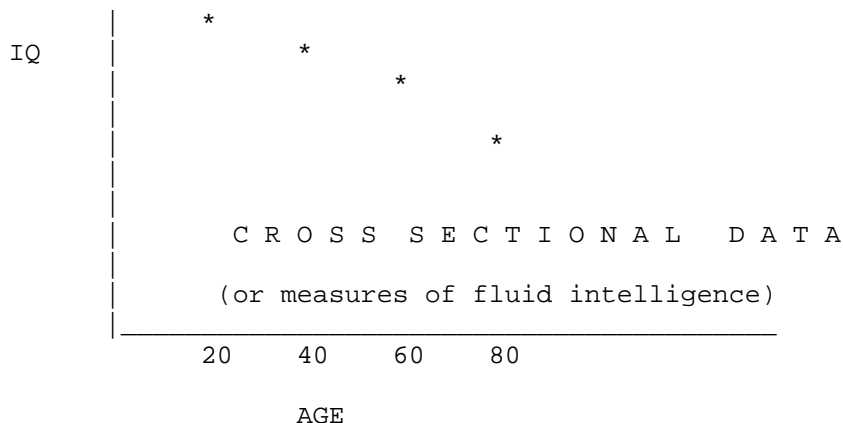
An alternative design for research is the **longitudinal**. These studies take the same sample and repeatedly measure it over different time periods. In dealing with children at an elementary school you could start this year with the first graders, and come back in just four years to look at the same kids as fifth graders. When you use a longitudinal study in gerontology, you have to wait many years between measures. (The same researchers who start such a study are rarely around at its completion, but must turn over the study to a new generation of investigators.) Another problem is that even when the study is over, we may have discovered a trend that only applies to the one cohort that was studied in the sample. The biggest problem in longitudinal research is known as differential attrition: the sample we end up with is not representative of the population. The people most likely to drop out of the sample (i.e., die) are those who use drugs, smoke, and have multiple sexual partners. The final sample will overly represent people like Ned Flanders, Mormons, and Seventh Day Adventists, and they are more likely to have traditional views about pre-marital sex.

longitudinal study done from 2010 to 2070: repeated measures

2010		2040		2070
first measure		second measure		third measure
=====		=====		=====
=	=	=	=	=
= 20 year olds =		=50 year olds=		= 80 year olds =
=	=====>=	=	=====>=	=
= born 1990 =		= born 1990 =		= born 1990 =
=	=	=	=	=
=====		=====		=====

design problem: differential attrition of subjects will yield a non-representative sample by the time later measures are done

These design problems impact most research on aging. For example, do mental abilities decline in later life? Suppose we use a standardized IQ test like the WAIS. Cross sectional studies usually show the younger (more test wise) cohort doing much better. Longitudinal studies show more stability of scores (as the poor performers are more likely to drop out due to attrition).



Case Study: Ms. J, 90, is in a nursing home due to physical disabilities (hip fracture, arthritis) but shows no signs of dementia. She is normally in good spirits. One day, the nursing home staff could not find her, which was very unusual because she was usually in her room, in the recreation area, or slowly moving between the two with her walker. Ms. J was discovered outside in the parking lot, under a tree. When asked what she was doing there, she replied "Every day I pray to the Lord to call me to heaven. My time in this old body should be over, but sometimes I worry that inside, He may not be able to hear me."

The Kubler-Ross model has been applied to the trajectory of bereavement (grief, mourning) in the survivors, especially when the death was unexpected.

QUESTION #12.4: What is the cognitive stage theory of development?

Jean **Piaget** constructed a stage theory of child development that is **cognitive**, emphasizing how children's mental abilities progress qualitatively in a fixed, invariance sequence of stages. Piaget is not so much concerned with emotion, or interpersonal processes, but with the child's cognitive schemas: the way that the child thinks about the world, using categories and heuristics to understand its complexities. As the child perceives new sensory information that fits his pre-existing schemas, the child engaged in assimilation, using the same schemas to digest the new information. If he confronts new information that does not fit into his pre-existing schema, he will have to engage in accommodation, changing his schema in some way so that the new information fits.

Stage one is sensorimotor (ages 0-2). The child is just beginning to relate to his senses and muscles and understand himself as different from the rest of the world. During this stage he comes to master the concept of object permanence. Before this happens (between 6 to 12 months) a child who is shown a toy, and then the toy is put behind a screen, may conclude that the toy no longer exists. This explains why children of this age are so fascinated by the game "peek-a-booh" because when the other person's face disappears, it is as if the other person has ceased to exist, and when the face returns, there is a magical quality.

X	
X	
X	
X	
X	
X	
X	
X	X X X X
X	X X X X
grape juice in	grape juice in
tall cylinder	flat bowl appears
appears to be more	to be less

Stage two is preoperational (ages 2-7). Here the child has mastered the rudiments of language and symbolic thinking. He can pretend that a stick is a gun or a horse. He is not yet capable of understanding the conservation of quantity. If he is shown some grape juice in a tall cylinder, and then watches it being poured into a flat bowl, he will think that there was more juice in the tall cylinder.

At this stage he also remains very egocentric, and is unable to look at something from the perspective of another person. In the three mountain problem, the child is asked to imagine how the three mountains (cones of different colors) must look to the doll on the left. In this arrangement, the big mountain is in the back, to the left. A medium sized mountain is in the back, to the right. A small mountain is on the right, fairly close, in front of the big mountain. Most children at this stage will assume that the doll would see it just like the child's own view from the front.

C H I L D ' S V I E W

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DOLL  # #                     $ @
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D O L L ' S V I E W

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Stage three is the concrete operational stage (ages 7-11). The child will come to understand that an object might fit in more than one category. A baseball fits into the category of plaything, and the category of white, and the category of round. The child will come to understand conservation of quantity (that we have the same amount of juice whether it is poured into one container or another). He will come to be able to perceive things from different perspectives.

Stage four is the formal operational stage (starting after age 11). The child will be able to employ abstract concepts, analogies, and hypothetical reasoning. Consider the following series of questions.

"Will a penny float?" The child agrees that it will not.

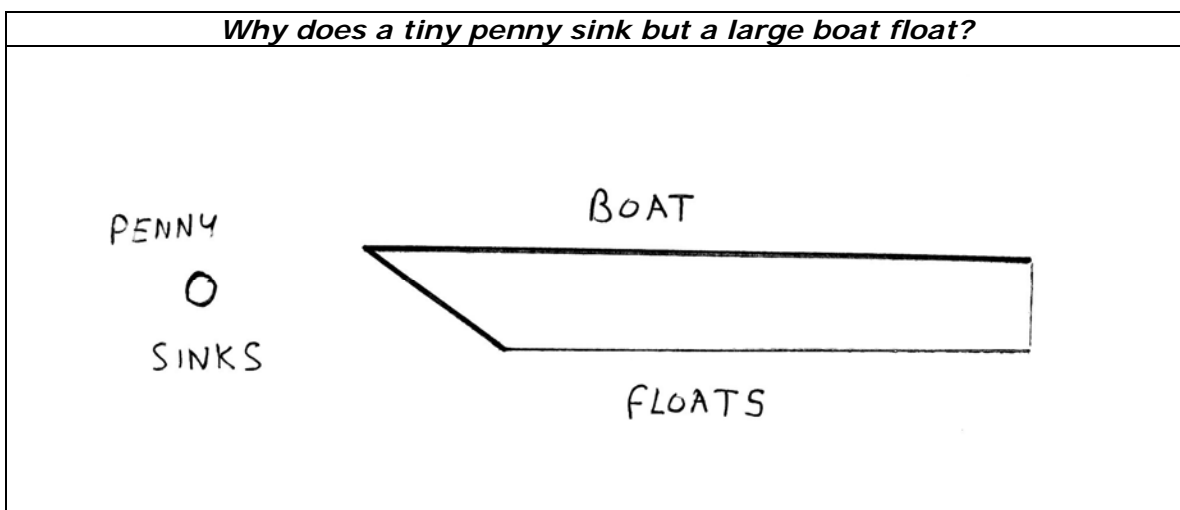
"Why doesn't a penny float?" The child says it is too heavy.

"Will a big boat float?" The child agrees that it can.

"What weighs more: a big boat or a tiny penny?" The child agrees that the boat weighs more.

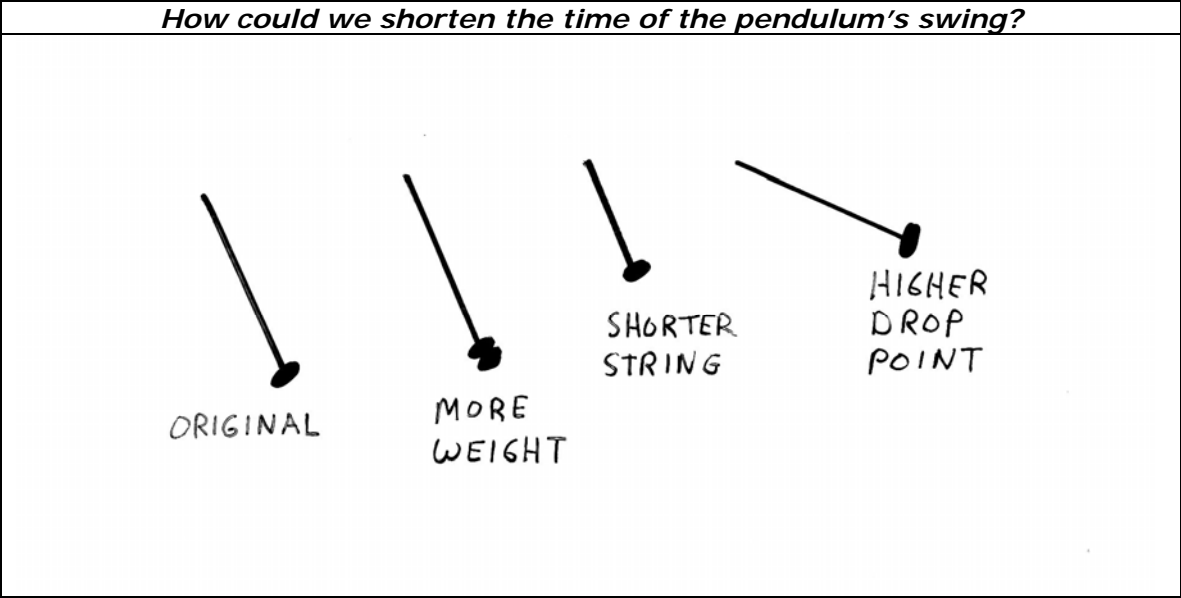
"Why will a big boat float, but a tiny penny sink?" The child may admit that he does not know, or guess that it may be the shape of the boat, or what it is made out of.

When children are firmly in the formal operational stage, their answers will be able to include something about the weight of the boat, in proportion to its size, being less than that of the water.

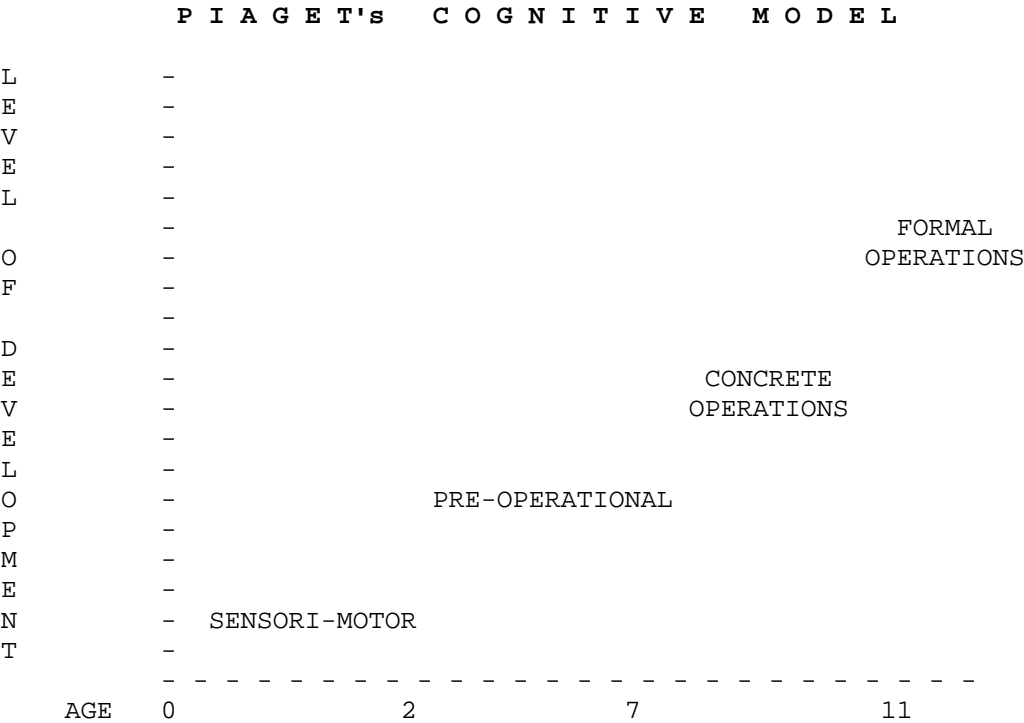


Another example is the pendulum problem. After being shown a pendulum, the child is asked, how can we get this pendulum to go back and forth in less time? He is shown three possible alternations of an independent variable: higher drop point, greater weight, or shorter string?

The correct answer is the shorter string, but to get it the child has to go through the formal operation of actually doing the experiment systematically: observing the results (swing time) of the manipulation of each independent variable.



Many psychologists have questioned the specifics of Piaget's stages, suggesting that children may be just confused by the phrasing of the questions, and maybe there are wider individual variations that he thought possible. However, the central concept to be gleaned from Piaget is that children can only learn complicated reasoning processes when they are ready.



Lev **Vygotsky** offered a different view of cognitive development in childhood. When children confront a task that is beyond their present capabilities, they may develop fear or frustration. A parent, teacher, or older child may intervene to provide the **scaffolding** the child needs to accomplish the task. This scaffolding may involve instructions, encouragement, and/or assistance. As the child demonstrates increasing competence on the task, the adult can decrease the level of assistance.

One follower of Piaget was Lawrence **Kohlberg**, who attempted to apply **cognitive** developmental theory to **moral development**. Kohlberg suggested that moral development is dependent upon the child's ability to reason out the ethical implications of actions. He suggested that there were three levels and six stages of this cognitive development. Most children are in the pre-conventional level, most adolescents make it into the conventional level, and some adults may make it into the post-conventional level.



K O H L B E R G ' S S T A G E S O F E T H I C A L D E V E L O P M E N T

LEVEL ONE: PRE-CONVENTIONAL

STAGE ONE: "What is bad is what you get punished for."

STAGE TWO: "What is bad is what has bad results."

LEVEL TWO: CONVENTIONAL

STAGE THREE: "Bad intentions are evil; good intentions are good."

STAGE FOUR: "Do your duty. Follow the rules."

LEVEL THREE: POST-CONVENTIONAL

STAGE FIVE: "Encourage democracy, protection of individual rights, due process of law."

STAGE SIX: "Pursue universal ethical principles."

One way to determine at which stage a child is functioning is to present a story with a moral dilemma, and listen to the child's verdict.

"This is a story about two boys, Jack and Jim. Both did something bad, but who should be punished more? Jack tried to help an old lady across the street, but they both slipped and she broke her hip. Jack intended to do something good, but the results were bad. Jim tried to break into an old lady's house to steal her money. When he tried to get in, that set off an alarm, and he ran away. When the police came to see why the alarm went off, they found that the old lady had fallen the day before, and could not get up. Because the Jim tried to get in, and set off the alarm, the police were able to come and save her life. Jim intended to do something bad, but the results were good. Which boy should be punished more severely: Jack who had the good intentions with the bad results, or Jim who had the bad intentions with the good results?"

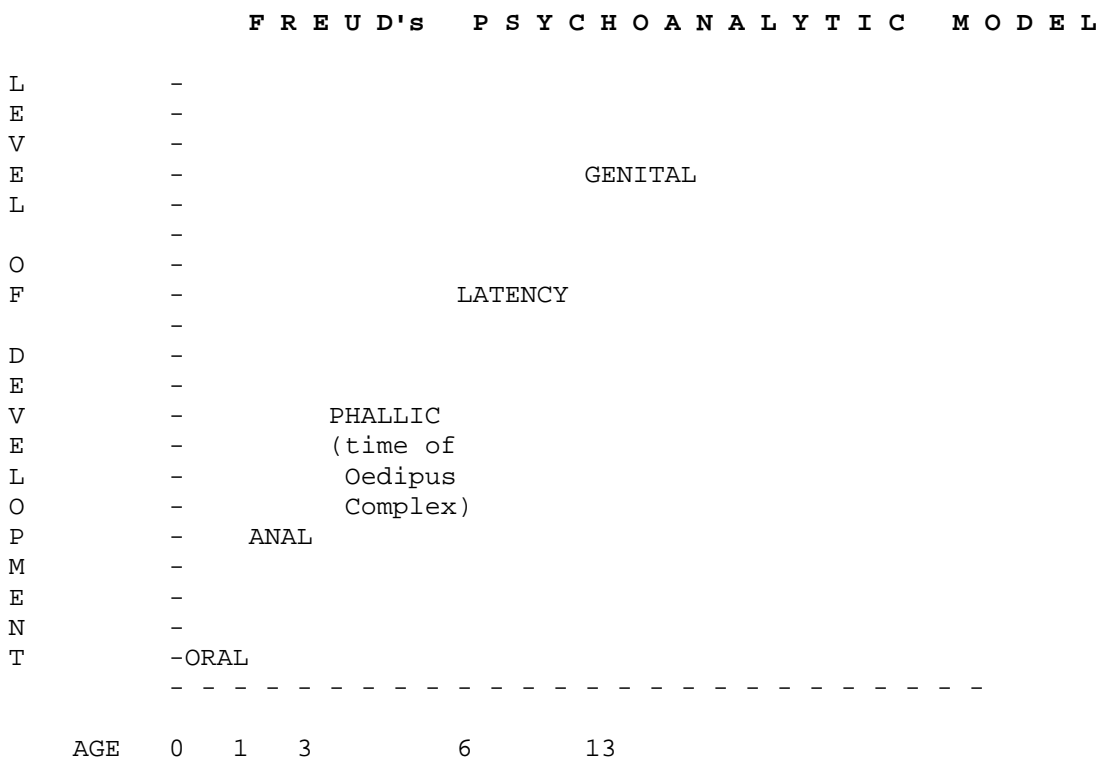
Children in the second stage will tend to punish Jack more severely (morality based upon results), while children in the third stage will tend to punish Jim more severely (morality based upon intentions).

Kohlberg's model may ignore some additional factors in moral decision-making. For example, boys are more likely to think in terms of concepts of justice, while girls are more likely to consider the feelings of everyone involved. Another factor may be the social context in which the individual functions.

Case Study: Mr. B, now in his 50s, considers himself to be honest and ethical, at least when dealing with U.S. government agencies. He is stage four, declaring all of his merchandise when he passes customs, declaring all of his income for the I.R.S. When he first started doing business in Mexico in 1976 he went down to the preconventional level of avoiding punishment or trying to get reasonably good results for all concerned. He engaged in smuggling and bribery in Mexico which he would never dream of doing in the U.S. With the passage of NAFTA and the change of government in Mexico, Mr. B no longer finds it necessary to engage in bribery or smuggling on the Mexican side, and he has come up to a stage four level of functioning on that side of the border as well.

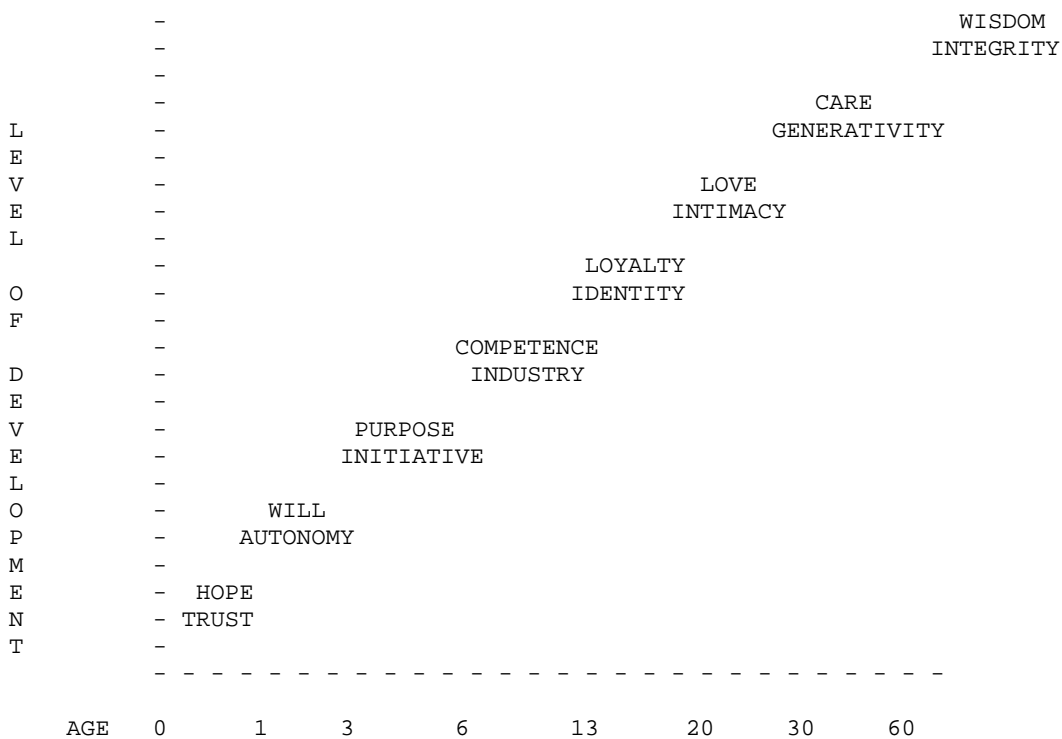
QUESTION #12.5: What is the psychoanalytic stage theory of development?

Freud's personality theory contains a developmental model focused on the locus of psychosexual energy. In the **oral** stage (0-1) the sexual energy is clustered about the mouth, as the infant gains pleasure from sucking at the breast. Disturbance and fixation at that stage can lead to a dependent and gullible individual. In the **anal** stage (1-3) the sexual energy goes to the opposite end of the alimentary canal during toilet training. Disturbance and fixation at the anal stage can result in a character type depicted by Ebenezer Scrooge: emotionally constricted, obsessed with cleanliness, order, punctuality, and frugality (traits associated with toilet excessive toilet training.) During the **phallic** stage (3-6) the sexual energy gets to the right place (phallus is the Greek word for penis). This is the time of the **Oedipus Complex**. Someone stuck in this phase would be flirtatious and seek many sexual partners. In latency (6-13) the sexual energy is quiescent. It is awakened in the full adult **genital** (13+) stage at puberty when the adolescent projects libido onto other members of the opposite sex beyond the mother.



<i>Freudian psycho-sexual developmental stages</i>		
Stage	Age	Characteristics of those fixated
Oral	0-1	Dependent, whiny, gullible
Anal	1-3	Emotionally constricted, frugal, orderly, punctual
Phallic	3-6	Flirtatious, conceited
Latency	6-13	
Genital	13+	

Erik **Erikson** was a loyal member of the Vienna **psychoanalytic** movement, trained by Anna Freud herself, and specializing in child analysis. Erikson never rejected his psychoanalytic foundations, but he just shifted the emphasis from the sexual to the interpersonal and cultural. He then added three adult stages. Each stage constitutes a critical period for the development of a key virtue. Failure to resolve any stage will make resolution of later stages more difficult.



In stage two, anal (1-3) the child must meet the social demands for toilet training. If he is helped to do this gently, he will develop a sense of autonomy from his biological limits, otherwise he may be plagued by shame and doubt about his ability to achieve anything. Successful toilet training is the prototype of his use of his will power.

In stage three, phallic (3-6) the child is in an intrusive mode and starts getting into everything. What he needs at this point is realistic standards of conduct that will not stifle his initiative. Erikson, who supported a relatively permissive approach toward childrearing, contended that excessive standards or limits would just give the child excessive guilt.

In stage four, latency (6-13) the child is in school, and must develop competency in both academics and social skills. A deficiency in either of these will give a sense of inferiority that will plague him the rest of his life. Erikson's description of this stage incorporates some of Adler's model.

In stage five, adolescence (13-20) the goal is to figure out who one is and formulate an individual identity. Erikson considered adolescence to be an important stage, a moratorium on adult responsibilities to give the teen the extra time needed to try out some different possibilities. If she keeps up this tentativeness too long, that results in identity diffusion. Eventually, the adolescent must have some fidelity to certain roles that can form the core of her new adult identity.

In stage six, young adulthood (20-30) the goal is to develop true emotional intimacy with another, and avoid selfish isolation. Success at this stage is heavily dependent upon success in the prior stage: if you do not know who you are (identity) you will have a hard time building an intimate relationship with another person.

Case Study: Mr. Z, born in 1920 (and discussed above) is a good example of stage six. He now admits that when he married his first wife at age 19, he was not ready for the responsibilities of marriage (either to know what he really wanted in a mate or how to function in the role of a husband). A couple of years overseas in the army, and a couple more living on his own after the divorce helped him identify his priorities in life, so that when he selected the second Ms. Z, he choose someone more compatible, and he was better prepared to be a good husband.

Stage seven, middle age (30-60) is the longest and the conflict is generativity vs. stagnation. This is the time when men must focus on developing their careers and raising their families. This is the time when they must create something which will sustain the contributions of their identity after they are gone. In this phase, Erikson has also incorporated much of Adler's ideas about social interest. Homer Simpson epitomizes the stagnant middle aged male. He hates his job. He is tormented by his children. He is perplexed by the needs of his wife. He just wants to eat, drink, and watch cable TV.

Stage eight, old age (60+) is the last. The task is to look back and accept that one has done well, without too many regrets or apologies.

Most gerontologists have found this to be a superficial and idealized view of old age, ignoring the "here and now" problems that can lead to depression.

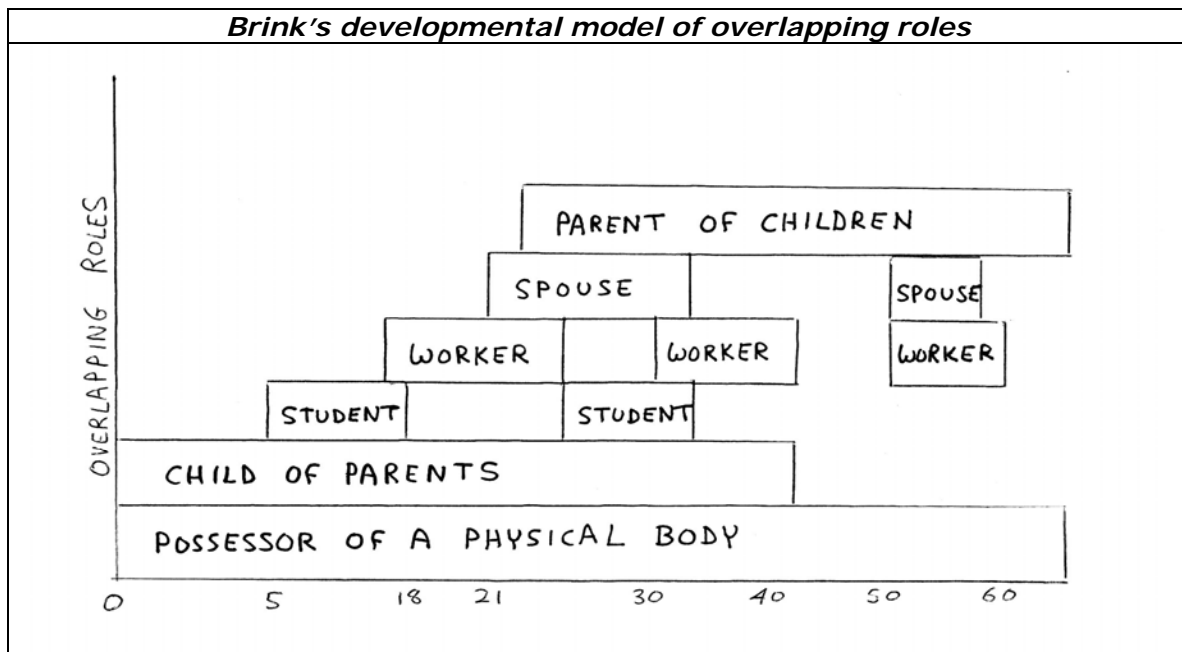
Erikson's model was further extended by Levinson who added several adult sub stages. Levinson did a longitudinal study of a graduating class of men from Yale. He found that most of them went through about a dozen identifiable stages (which may be attributable to the homogeneity of his sample).

Carol **Gilligan** has pointed out that Erikson's model is excessively male. Female development tends to come less in fixed stages and more in terms of gradually widening circles of caring relationships.

All of the stage theories tend to overemphasize the similarity of experience of each individual going through the life cycle and ignore individual differences. Both Piaget and Erikson worked primarily at the front end of the life cycle, where individual differences in the life cycle are minimal: e.g., all children start school around age 5. At the end of the life cycle there is greater variability, in physical and mental hardiness, accomplishments, and fate.

One way to appreciate these differences is to get out of the modality of stairs, and start thinking in terms of multiple moving conveyor belts, and how people have to straddle several of them simultaneously, and how they make choices to get on, or off and maybe on again. The only role you have from the day you are born until the day you die is that you are a possessor of a physical body. The other roles come and go, and perhaps change. For example, you are a child of your parents until they die, but that role changes after about age 18. You will probably start the student role at age 5, and remain to at least 18, but some people choose to stop then, and maybe come back and restart it later by going back to start or finish college. The work role usually starts in the late teens, but that also might stop at times: to go back to school, to be a primary at home parent, to take care of aging parents, or because of unemployment, disability or retirement. The spouse role starts, usually in the twenties, but that can be ended (by divorce or widowhood) and then started again by remarriage. One of the most powerful and enduring roles is being a parent to one's own children. This conveyor belt (or "people mover") model is of use to clinical psychologists and vocational counselors who are trying to understand the client's condition and help the client make realistic decisions about role commitments.

Case Study: Ms. L, age 64, has her life space depicted by the diagram below. With it we can see several problematic periods of her life. She experienced some rapid role transitions in her late twenties. In one year she quit work, had a baby, and tried to go back to school. A few years later, she got out of a bad marriage and went back to work at the same time. In her forties, she was parenting teenagers, then quit work to take care of a dying parent. She then went into a deep depression, and when she came out of it she remarried and went back to work. In her early sixties, she became a widow and then was forcibly retired within the same year. Focusing on these stress points in life can help her sort through priorities, and strengths, and make good decisions for the rest of her life.



Theories of Psychological Development			
Theorist	Approach	Subjects	Main theme
<i>Lorenz</i>	Ethology	ducks, geese	Imprinting in critical periods
<i>Harlow</i>	Lab experiments	monkeys	Infants need nurturing and mental stimulation
<i>Freud</i>	Psychoanalytic clinical & historical case studies	adult patients, Da Vinci, Wilson	Psychosexual fixation
<i>Erikson</i>	Psychoanalytic clinical & historical case studies	child patients, Luther, Gandhi	Eight psychosocial critical periods
<i>Piaget</i>	Cognitive	children	Cognitive stages of reasoning
<i>Kohlberg</i>	Cognitive	children & adults	Cognitive stages of reasoning about ethics
<i>Vygotsky</i>	Cognitive	children	Process of helping the child learn new tasks
<i>Brink</i>	Cognitive Clinical & industrial & historical case studies	elders, workers, Hitler, Joseph Smith	Overlapping roles