

Psychology:

a student friendly approach

(7TH EDITION)

authored by

T.L. BRINK, PH.D., M.B.A.

published by

The San Bernardino
Community College District
San Bernardino, CA

2018

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tlbrink@sbccd.cc.ca.us

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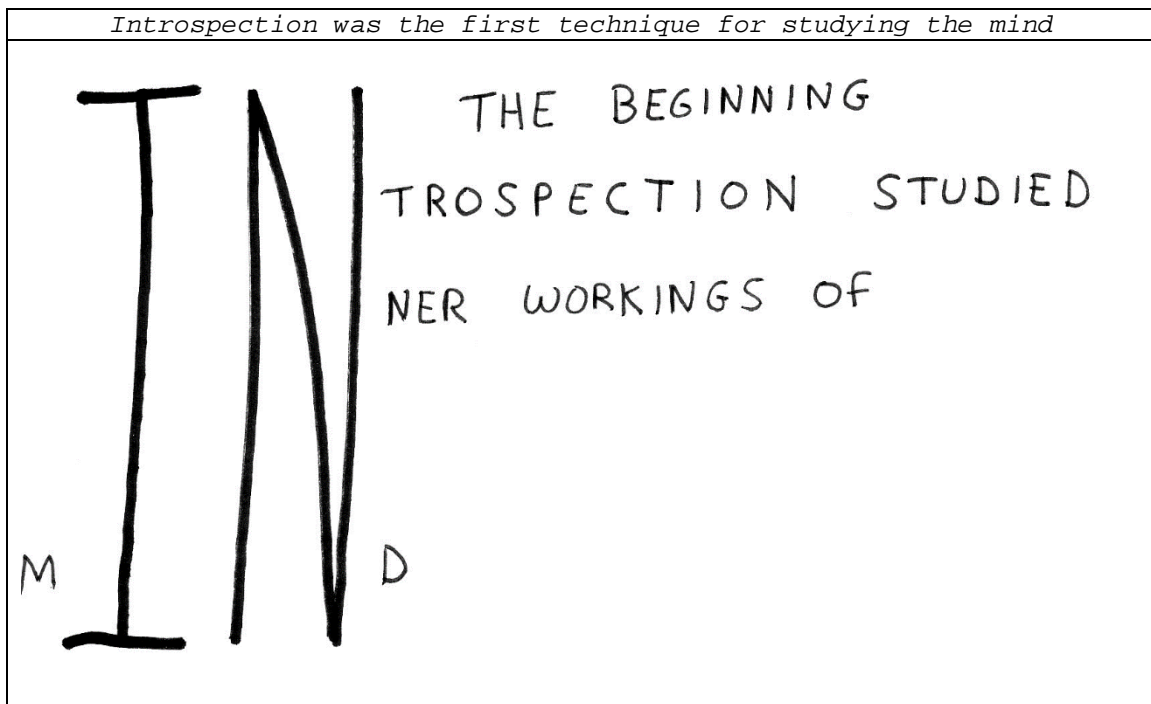
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UNIT 1: THE DEFINITION AND HISTORY OF PSYCHOLOGY

QUESTION #1.1: What is the definition of psychology?

Psychology is best defined as the "scientific study of behavior in humans and animals." Some definitions are a little broader, including "mental processes," but the essential features of psychology involve "science" and "behavior." **Behavior** is what people and animals do: e.g., what a person says about last night's dream, or how long it takes a rat to run a maze, or which brand of perfume a customer purchases.

Maybe you thought that psychology was the "study of the mind" due to the fact that the prefix *psyche* is Greek for mind, soul, spirit, and the suffix *ology* refers to the study of something. About a hundred years ago, John **Watson** decided that psychology should be a science: not just a vague and introspective reflection on our own thoughts and feelings. Watson urged that psychology be defined as the scientific study of behavior (since it was only overt behavior, and not the mind itself, that could be studied objectively). Since about 1920, most university psychologists have accepted Watson's definition. So, think of psychologists as scientists who study behavior.

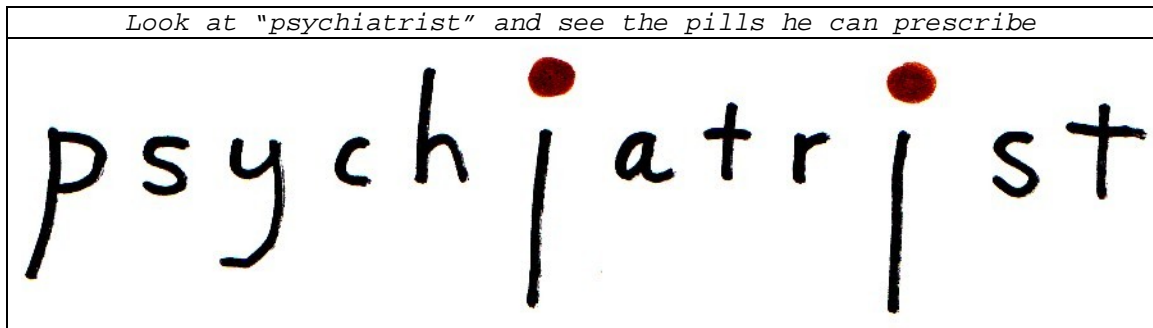


There are some terms related to psychology that are frequently confused with it. You must be able to distinguish between psychology and fields such as psychiatry, psychotherapy and psychoanalysis. These are not branches or sub-fields of psychology.

Psychiatry is a branch of medicine specializing in the treatment of patients with mental disorders. Psychiatrists are medical doctors, and have been through medical school, an internship, residency training, and board certification as specialized physicians. The letters M.D. or D.O. usually appear at the end of the name. The letters at the end of the name of a psychologist may be Ph.D., Ed.D., or Psy.D., and so it may be appropriate to address a psychologist as "Dr." but he or she is not a physician.

There is one important difference between what psychologists and psychiatrists can do. Under the current laws of most states and countries, the ability to write prescriptions for psychiatric medication is limited to physicians. So, if you needed a prescription for an anti-depressant like Prozac, you would have to go to a psychiatrist (or other physician); a psychologist could not legally write the prescription under current laws in most states.

Here is how to remember what psychiatrists can do.



Notice that the word *psychiatrist* unlike the word *psychologist* repeats the letter *i*. Now, look at the dots above those letters, and imagine that they are little Prozac pills.

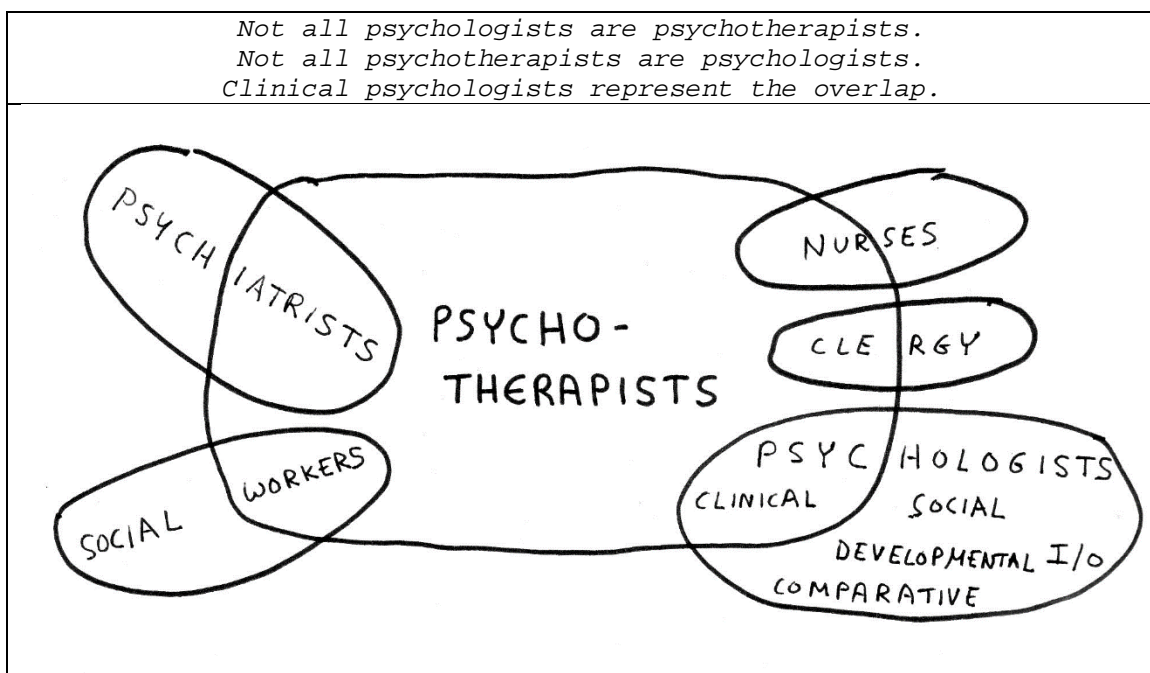
Psychotherapy is a form of treatment emphasizing communication. A psychotherapist is a mental health professional who treats patients ("clients") by communicating with them. Usually, this takes place in verbal form: talking and hearing. Here is how to remember that.

P	S	Y	C	H	O	T	H	E	R	A	P	Y
						A	E					
						L	A					
						K	R					

At the very middle of the word *psychotherapy* you find the letters *t* and *h* and they stand for talking and hearing, the kind of communication that goes on in psychotherapy.

Only some psychologists, **clinical psychologists, can perform psychotherapy**, but most psychologists do not, working instead in some other branch of psychology. Some psychiatrists perform psychotherapy, but most do not, relying instead on other forms of psychiatric treatment, such as medication. Not all psychotherapists are psychiatrists or psychologists. Some psychotherapists may have professional training as a marriage counselor, social worker, nurse, or member of the clergy (e.g., priest, minister, imam or rabbi), such as a hospital chaplain.

Here is how to remember that not all psychologists are psychotherapists, and not all psychotherapists are psychologists. Notice the overlapping relationships between these categories.



Psychoanalysis refers to the theories of the mind and psychotherapeutic techniques developed by **sigmund Freud** (pronounced FROID). Do not use the noun *psychoanalysis* or the adjective *psychoanalytic* or the verb *to psychoanalyze* synonymously with psychology, psychotherapy, or psychiatry, but only to refer to that which is Freudian.



Freud himself was a medical doctor, so we can also call Freud a psychiatrist. He treated his patients by talking with them, so we can also call him a psychotherapist. Whether or not we can also call Freud a psychologist depends upon whether or not we consider his research methods sufficiently scientific to warrant that title.

A psychoanalyst is someone, usually a psychotherapist, who has received specialized formal training in Freudian theory and techniques. Until about 1960, most American psychiatrists and psychotherapists were of a psychoanalytic orientation. Today, most psychiatrists emphasize medication as the main approach to treatment, and most American psychotherapists follow other, non-Freudian theories and techniques of treatment.

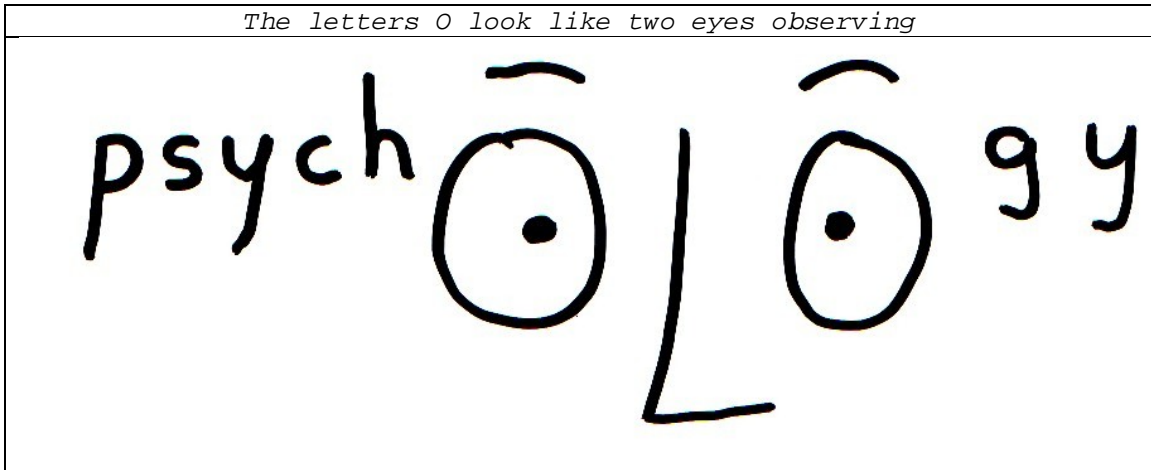
QUESTION #1.2: What makes psychology scientific?

Empiricism emphasizes objective and precise measurement. Psychology is a science because it follows the empirical method. The scientific status of any endeavor is determined by its method of investigation, not what it studies, and certainly not by who did the investigation. All true sciences use the empirical method.

Psychology and the other behavioral or social sciences (sociology, anthropology, economics, political science) are not as precise in their measurements as are biology, chemistry or physics, but to the extent that psychologists use empirical evidence, the findings of psychology may be referred to as scientific.

It is this emphasis on the empirically observable that made it necessary for psychology to change its definition from the study of the mind (because the mind itself could not be directly observed) to the science of behavior. We can directly observe and carefully measure externals such as what a person does, says, and marks down on a psychological test. We cannot directly observe a person's mind (e.g., internal thoughts, emotions). Even brain scans do not directly measure what a person thinks or feels, but only how the brain is acting.

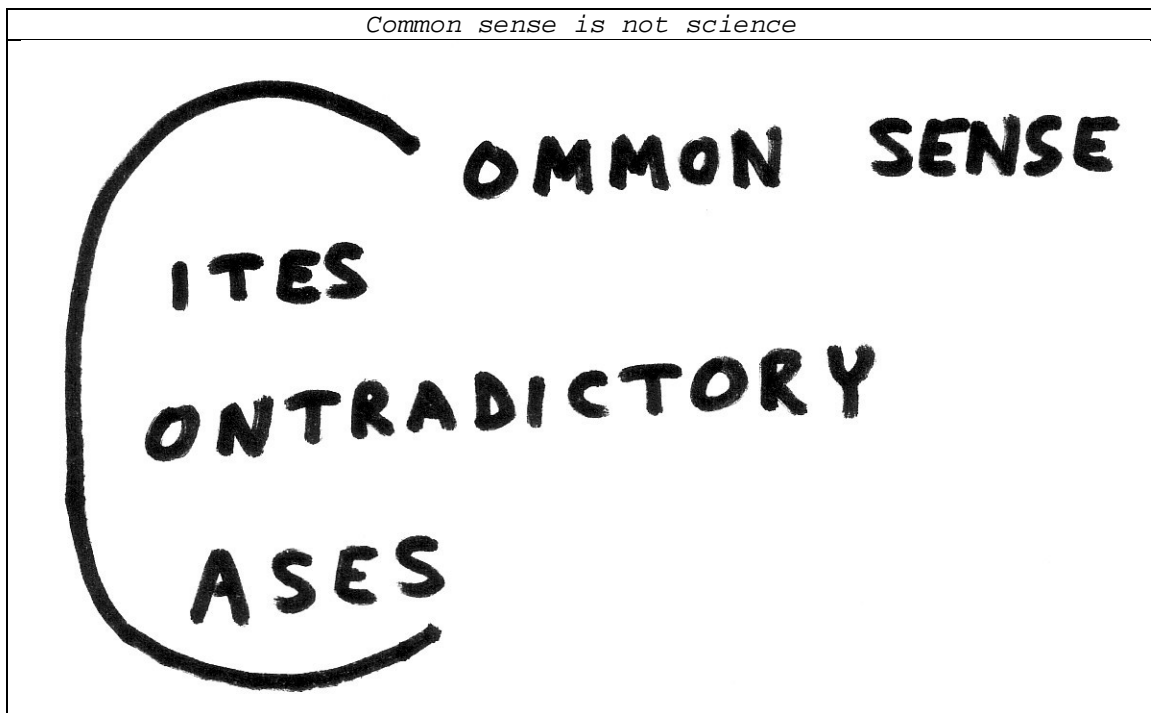
Here is how to remember that a psychologist is a scientist who studies behavior using the empirical method. Notice that in the word *psychologist* the letter *O* is repeated twice. That does not happen in *psychiatrist* or *psychoanalyst* or even *psychotherapist*. Imagine that those letters are eyeballs opened wide, so that the psychologist can better observe behavior: e.g., what a rat does in a maze or how a patient behaves.



Pseudo-psychology is phony, non-scientific speculation about human behavior. Astrology (trying to predict a person's behavior or character on the basis of the position of planetary bodies) is generally regarded as a pseudo-science because of its origin in ancient Babylonian religion, not in the modern science of astronomy, which carefully measures and calculates the position of the planets. If someone were to gather enough data to prove that astrology could consistently and

systematically predict behavior or character, then astrology would become a genuine science. However, until that evidence is presented, scientists, including psychologists, prefer to err on the side of skepticism and regard astrology as a pseudo-science.

Common sense, by itself, is not sufficient for science. Common sense refers to generally accepted ideas about human behavior, but many of these have not been subjected to the kind of systematic investigation that formal science demands. Common sense tends to limit its database to self-reflection (**introspection**) and over-emotionalized, isolated examples (anecdotes), some of which might even be contradictory. Common sense may be a starting point for some of our hypotheses about human nature, but we cannot stop there: we must go forward and systematically gather empirical data to test those hypotheses. So, it is best not to use the term *common sense* in this course.



GRAMMAR LESSON: The word *hypothesis* is singular. The plural word would be *hypotheses*.

Data are the bits of information that are observed by psychological research. Within the social sciences, it is best to regard the term *data* as a plural word. So, we should say *these data are* instead of *this data is*. Within other fields, such as information technology, data is regarded as singular (a base of information) and therefore, in that field, people say *this data is*.

GRAMMAR LESSON: The word *data* is plural, and means “facts.” The term for a single bit of information is *datum*.

A theory is an abstract concept which science uses to understand, explain, or control what is being studied. Theories are never to be seen as substitutes for an insufficiency of facts. Theory works together with observed data to form scientific knowledge.

DATA + THEORY = KNOWLEDGE

If we have only theory, but no data, we do not have scientific knowledge, but only idle speculation. If we have only data, but no theory to make sense of those data, then we are left with meaningless trivia. Both theory and data are essential components of scientific knowledge. Scientific knowledge is always growing. Sometimes the growth is produced by new data (more facts to back up an old theory, or perhaps challenge an old theory) and sometimes the growth is due to a new theory that does a better job of explaining existing data.

Inference is the process of reasoning from something directly observed to something else not directly observed. This word comes from the verb *to infer*. Psychologists observe behavior and then make inferences about why the person (or animal) behaved in that way. Emotions, motives, and abilities are never directly observed, but only inferred. Here are some examples of inferences that psychologists (or you yourself) might make.

OBSERVATION	INFERENCE
The patient scored high on the depression scale.	The patient is feeling very depressed.
The cat went to the water bowl before going to the food bowl.	The cat is more thirsty than hungry right now.
That guy plays his music too loud.	He is a jerk.

Science tries to explain the natural world with theories of cause and effect. Sometimes we observe an effect, and infer a likely cause.

OBSERVATION <i>effect</i>	INFERENCE <i>cause</i>
The little girl is crying.	She probably fell and got hurt.

Of course, if the cause was not essential to produce the effect, we could be mistaken, for there may be some other cause of the observed behavior. Perhaps the little girl was not able to use the swing because another child cut in front of her: she was not physically hurt, but her sadness was due to disappointment.

Sometimes we observe a cause, and infer a subsequent effect.

OBSERVATION <i>cause</i>	INFERENCE <i>effect</i>
That little boy is being badly beaten by his father.	He will grow up to become a serial killer.

Of course, if the cause is not always adequate to produce the effect, these predictions can be mistaken. Predictions are much easier in a science like physics, where all hydrogen atoms always react in the same way. In psychology, we must keep in mind that people do not merely react, but they respond. Between the **cause** (an environmental **stimulus**) and the **effect** (the **response**) is an **organism** (a person or an animal). The stimulus is always something external, a change in physical or chemical energy that the organism can perceive (e.g., a loud sound). The stimulus is not an internal drive (e.g., hunger). The organism is a person or animal who perceives the stimulus and then creates a response. The response is what the organism does (e.g., action, speech, performance, choice, scores on a test). The stimulus **elicits** a response; the organism **emits** a response.

STIMULUS	ORGANISM	RESPONSE
= what just =	= the person=	= what the =
= happened =	= or animal =	= organism now =
= in the =	=>= who has >=	= thinks, feels, =
= organism's =	= just been =	= or does =
= environment =	= stimulated=	= =
=====	=====	=====

GRAMMAR LESSON: The word *stimulus* is singular. The plural is *stimuli*.

Because no two people are exactly alike, there is only a limited ability to predict if a given stimulus will lead to a given response. Psychologists disagree about whether these differences are due to *free will* (different organisms make different choices on how to deal with the same situation) or whether different responses are determined by the different background factors (e.g., heredity, early childhood) influencing later responses to later stimuli.

So let us be cautious when we infer what will become of an abused child. Perhaps the mistreated little boy will become a serial killer, or perhaps he will develop a great empathy for other abused children, and become a police officer, nurse, social worker or psychotherapist who tries to help others in the same situation.

This course in psychology will overlap in its topics and methods with other courses. The sciences of biology and sociology also use the empirical method and study human life, but their focus is different. Biology has a *micro* focus, and looks at human life as organ systems and metabolism. Sociology has a *macro* focus and looks at human life in terms of participation in larger units: groups and cultures. Think of

psychology as the bridge between biology and sociology. The first few units of this book emphasize the physiological areas of psychology, and the last units will overlap with sociology.

BIOLOGY	PSYCHOLOGY	SOCIOLOGY
<i>Study human life as</i>	<i>Study human life as</i>	<i>Study human life as</i>
Organ systems of tissues and metabolism	Individual centers of thought, emotion, and action	Participants in group and cultural processes

The relationship between psychology and religion is often debated. Some (but not most) scientists are atheists who view religion as not much more than superstition or pseudo-science. Sigmund Freud (the psychoanalyst) and B.F. **Skinner** (the Behaviorist) thought that as science came to better understand human behavior, there would be less reliance upon religion.

On the other hand, some religious extremists may oppose science. Cult leaders may claim to be the only authority on everything and forbid their followers from consulting science. Some traditional religious fundamentalists take scripture (e.g., the *Bible, Torah, Quran*) literally, and contend that scripture contains all that we need to know about human nature, and therefore, we do not need a science of behavior.

On the relationship of religion and psychology, this book takes the middle position: there is no contradiction between the two because they employ different methodologies in coming to conclusions about human nature. Psychology and other sciences use the empirical method of observation. Religion gets its knowledge from revelation: scripture, a prophet, a pope, etc. Science tells us what people are like, while religion tells us what people *should* be like. Psychology searches for techniques to promote mental health, while religion seeks salvation. It is the contention of this book that one can be a devout Christian, Jew, Hindu, Jain, Sikh, Zoroastrian, Muslim or Buddhist and also be a good scientist. The religiously devout should not be concerned that psychology, or any other science, is going to conclude that God does not exist, or come up with another formula for saving one's soul.

	SCIENCE	RELIGION
<i>Method</i>	Empirical observation	Revelation
<i>Truth as</i>	Valid data	Enduring values
<i>Human nature</i>	The way it is	The way it should be

Most psychologists, psychiatrists, and psychotherapists are not atheists, but have some religious affiliation. Indeed, many Catholic priests, Protestant ministers, and Jewish rabbis blend modern psychotherapeutic techniques with traditional spiritual counseling in what is known as pastoral care.

QUESTION #1.3: Who were the major figures and schools in the historical development of psychology as a science?

We could go back to the first human who introspected, and reflected upon questions such as *Why do I feel what I feel? think what I think? do what I do?*

We could start on the continent of Africa, with the Egyptian physician Imhotep, who dissected and observed the human body. His later Greek counterpart, Hippocrates, is better remembered, probably because his writings have been better preserved. **Hippocrates concluded that mental disorders were not due to demonic possession, but to physical problems with the body.** He is also credited with the first physicians' oath embodying ethical principles and professional obligations. **Galen**, who lived in Rome during the first century of the common era, concluded that the brain and nervous system had a central role in thought and emotion. A clearer understanding of how mind and body interact had to await the foundation provided by chemistry and biology in the last hundred years.

Philosophers and theologians have long addressed the question of human behavior and **free will** (the idea that people actually choose what they are going to do) or **determinism** that thoughts, emotions, and behaviors are completely determined by forces beyond our control (e.g., heredity, environment, the unconscious). In ancient Greece, Socrates advocated the use of questioning as a method of furthering knowledge. His student, Plato, concluded that the healthy mind (soul) was governed by reason and kept the body's passions and the quest for honor in check. Plato's student, Aristotle, advocated more of an empirical approach to understanding the world, but he did not always stick to rigorous observation. For example, Aristotle used mere reasoning to conclude that the heavier an object is, the faster it will fall to earth. It took almost two thousand years before Galileo actually performed an experiment at the leaning tower of Pisa to conclude that it was an object's mass density, not its weight, which determined the rate of its descent.

Modern science is generally traced from events in Europe known as the Renaissance and the Enlightenment. British philosophers such as Bacon and Locke emphasized the importance of empiricism as the basis for science. Gradually, the empirical method advanced with the use of the telescope to observe the planets, the microscope to detect germs, and the laboratory to perform experiments on chemicals, cells, and electricity.

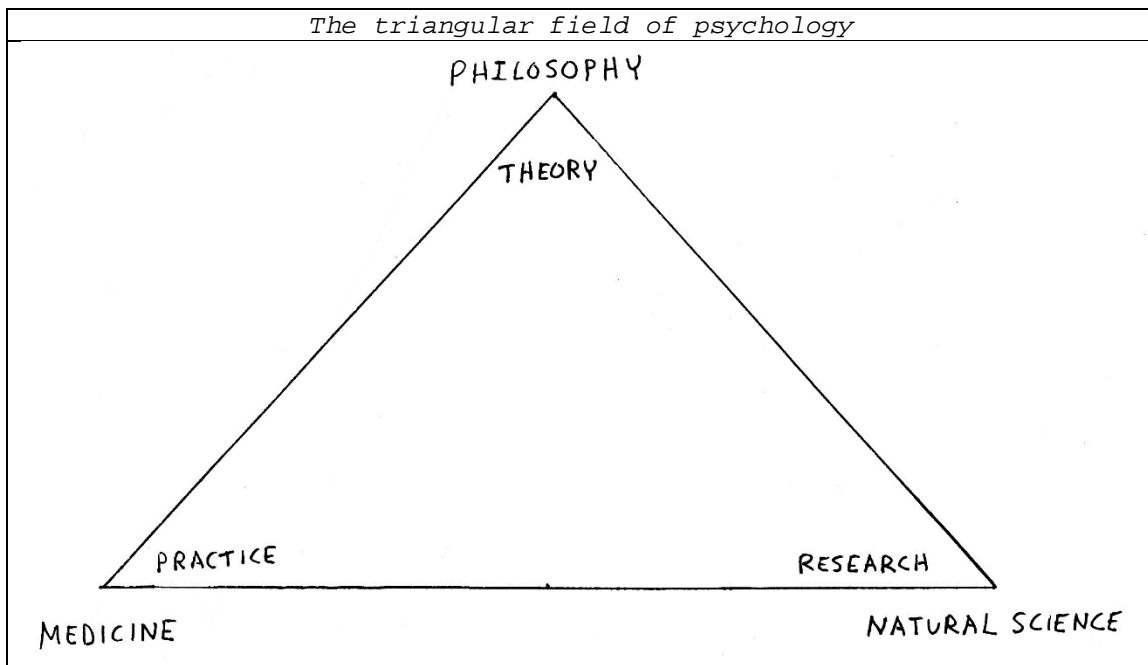
Science needs math. In 19th century England, nursing pioneer **Florence Nightingale** and physician Sir Francis **Galton** applied statistics to health care and epidemiology: "Wherever you can, count." In Germany, physicist Gustav **Fechner** (say "FEK ner") developed mathematical formulas that related the brightness of light to the ability of humans to detect the stimulus. Today, we would regard much of the research of Galton and Fechner as being within the field of psychology.

The first psychology research laboratory is usually credited to Wilhelm Wundt (say "VOONT") of Leipzig, Germany, in 1879. He was a physician

by training, but developed an interest in investigating human behavior. He established the first university department of psychology, and the first professional journal in the field. However, much of his laboratory work would not be considered true experiments by present day standards. His main research technique was still **introspection, reflecting on his own private mental activities**. Wundt's school was known as **German Structuralism** because he maintained that the structure of the mind could be inferred from observing the structure of its thought. Wundt influenced the first generation of scientific psychologists in Europe and abroad.

On this side of the Atlantic, **William James** was an American physician who offered the first U.S. course in psychology in 1875 and also developed a demonstration laboratory at Harvard. He also studied the contents of his own "stream of consciousness" but acknowledged some of the limitations of introspection. His school became known as **American Functionalism** because he emphasized **how organisms function with respect to their environments**. Although James recognized the power of habits, he championed the doctrine of free will: that people are not mere billiard balls reacting to their environment, but conscious organisms with the power of deciding how to respond.

More than anyone else, it was William James who put together the modern field of psychology in his definitive book, *Principles of Psychology* in 1890. The field of modern scientific psychology is actually triangular, with the three corners representing the three starting points of medicine, natural science and philosophy. Each of these left a different focus in the study of human behavior: clinical practice, laboratory research, or theoretical formulations. William James had training as a physician, a laboratory for some rudimentary research, and a growing interest in pragmatic philosophy.



Today, a good undergraduate curriculum in the field of psychology must cover all the corners of this triangle. Regardless of your future career objective within the field of psychology, you must learn about its theories, research methods, and clinical applications.

The **American Psychological Association** was founded in 1892 by **G. Stanley Hall** of Clark University. Credit for the current definition of psychology should go to John B. **Watson (the founder of Behaviorism)** who urged that psychology reject the purely introspective approach of studying the mind, and define itself as the science of behavior, even if that shifted the data of psychology from the armchair study of the mind to observing animals in cages.

<i>Pioneers in psychology</i>				
NAME	DATES	COUNTRY	BACKGROUND	METHODS
Weber	1795-1878	Germany	Physiology	Math Laboratory
Fechner	1801-1887	Germany	Physics	Math Laboratory
Dix	1802-1887	U.S.	Nursing & Activism	Reform of Mental Health
Nightingale	1820-1910	England	Nursing	Statistics Cases
Galton	1822-1911	England	Medicine	Statistics
Wundt	1832-1920	Germany	Medicine	Introspection Laboratory
Bucke	1832-1903	Canada	Medicine Literature	Introspection Cases
James	1842-1910	U.S.A.	Medicine Art	Introspection Laboratory
Pavlov	1849-1936	Russia	Medicine Physiology	Laboratory
Hall	1844-1924	U.S.A.	Divinity	Survey Laboratory
Ladd-Franklin	1847-1930	U.S.A.	Psychology	Animal behavior
Ebbinghaus	1850-1909	Germany	Philosophy	Graphs Laboratory
Ramon y Cajal	1852-1934	Spain	Medicine Physiology	Laboratory
Kraepelin	1856-1926	Germany	Medicine	Cases
Freud	1856-1939	Austria	Medicine	Introspection Cases
Binet	1857-1911	France	Law Entomology	Testing
Calkins	1863-1930	U.S.A.	Philosophy & Psychology	Introspection
Titchener	1867-1927	England	Philosophy Physiology	Introspection
Washburn	1871-1939	U.S.A.	Psychology	Animal Behavior
Watson	1878-1958	U.S.A.	Psychology	Laboratory
Wertheimer	1880-1943	Czech	Psychology	Laboratory
Note: psychology's female pioneers are in a different font .				

Modern psychology owes its advances to men and women who differed greatly in terms of their academic training, research methods, topics of interest, and countries of origin. Although most of the earliest figures in psychology were white males, the field soon attracted women and persons of all ethnic backgrounds. Margaret **Washburn** was the first woman Ph.D. in psychology in 1894. Mary Whiton **Calkins** was the first woman president of the American Psychological Association in 1905. Kenneth B. **Clark** was the first African-American president of the American Psychological Association, over a half century ago. Today, two thirds of the students in American graduate programs in psychology are women. Around the world, the figure is well above three-quarters.

Many of the pioneers of scientific psychology developed a loyal cadre of followers who continued to advance the founder's research and theory. One early school was the Structuralism of Wundt. It developed in Germany, but was brought to England and the U.S. by Edward Titchener. **Structuralism** was based primarily upon introspection and assumed that the structure of the mind could be inferred by observing the structure of how it perceived. The approach of William James became known as American **Functionalism**. He wanted to focus more on how the organism adapted to its environment, but he still used introspection in the form of following his own "stream of consciousness". The more extreme environmental approach of **Behaviorism rejected introspection as unscientific**, and instead suggested that research be confined to laboratory studies of human and animal behavior.

		<i>When the school started</i>	
		Before 1900	After 1900
W H E R E	European	Structuralism Wundt: demo labs and introspection	Psychoanalysis Freud: case studies and introspection
	American	Functionalism James: demo labs and introspection	Behaviorism Watson & Skinner: serious labs Humanism Maslow & Rogers: case studies and introspection
S T A R T E D			

Within psychotherapy, the first great school was Freud's psychoanalysis, with its emphasis on the unconscious determinants of behavior: sexual and aggressive drives. After 1960, the psychoanalytic hold on American psychotherapy gave way to the more **Humanistic approach of Rogers, emphasizing free will, and the great reservoir of human potential and goodness.**

SCHOOLS OF PSYCHOLOGY

School	Start	major figure(s)	studied	branch	research
STRUCTURALISM	19c	Wundt Titchener	perception	Experimental	demo labs
FUNCTIONALISM	19c	James Angell	adaptation to environment	Experimental	demo labs
PSYCHOANALYSIS	19c	Freud Erikson	unconscious sex & aggression	Clinical	Cases
BEHAVIORISM	20c	Pavlov Watson Skinner	conditioned behaviors	Experimental	serious labs
HUMANISTIC	20c	Adler Rogers Maslow	free will	Clinical	Cases
COGNITIVE	20c 21c	Schachter Beck Csikszent- mihaly Seligman	expectation interpretation flow	Experimental Clinical Industrial	Serious labs, cases, Big Data

QUESTION #1.4: What are the major fields of psychology today?

Modern psychology is a hybrid science, a tree with many roots and many branches, but a common trunk of empirical methodology. As in other professions (e.g., medicine, engineering), most psychologists tend to specialize in one particular field of psychology, but these fields often overlap, so a psychologist might work in more than one field.

Clinical psychologists are still the most numerous field. These are the psychologists who **work with mentally ill patients**, alongside psychiatrists, social workers, and nurses. Many clinical psychologists are in private practice, while others work for hospitals, health maintenance organizations, prisons, or agencies. Some clinical psychologists assess the mental health of patients and diagnose specific mental disorders. Some clinical psychologists perform **psychotherapy**, while others use other techniques of treatment or specialize in diagnosis.

Industrial / Organizational psychologists (I/O) study the workplace. They may be in private practice, or be employed by large private companies, consulting firms, government agencies, or the military. Industrial psychologists focus on selecting, training, and supervising workers.

Consumer psychologists study the marketplace. They help determine which people are the best source of potential customers for a product, which products will sell, and how to advertise to products.

Comparative psychologists study different animal species. **Ethologists** study animals in natural habitats: feeding, mating, aggressive, and other social behaviors.

Experimental psychologists work primarily in laboratories, studying topics such as sensation, perception, learning, and memory.

Developmental psychologists focus on specific stages of the lifespan: infants, toddlers, children, adolescents, young adults, and/or old age.

Social psychologists study how people respond to **interpersonal** stimuli: **attitude** change, prejudice, group behavior, and conformity to **cultural** norms.

For example, T.L. Brink has researched the later life cycle. This work in gerontology would be part of developmental psychology. He has performed experiments on the best way to assess memory decline, so that could be called experimental psychology. Most of his books have been about the assessment and treatment of mental disorders in later life, which would be in the clinical area. He had a consulting firm which specialized in recruitment and assessment of engineers, which would be I/O). More recently, he has done consulting on entrepreneurship and marketing, which puts him in the area of [consumer behavior](#). Currently, he is doing research on attitudes toward cancer treatments, which would be more in the social psychology field.

Psychiatry is not a branch or a sub-field of psychology, but separate profession, rooted in medicine. Psychotherapy and psychoanalysis are not branches or sub-fields of psychology, but overlapping fields (in which most of the practitioners are non-psychologists). Pseudoscience is not a branch or sub-field of psychology, but a non-scientific (or anti-scientific) alternative view of how we should study the behavior and mental processes of humans and animals.

<i>Fields of psychology</i>			
specialty	proportion	where they work	activities
Clinical	About half	Private practice Clinics Hospitals Universities	Diagnosis Psychotherapy
Cognitive	Small but growing	Universities	Basic Research
Community	Small but growing	Government Universities	Applied Research
Comparative	Small	Universities	Basic Research
Consumer	Small but growing	Corporations Private practice	Applied Research
Counseling	a tenth	Private practice Clinics Hospitals Universities	Counseling
Cultural	Small	Universities	Basic Research Applied Research
Developmental	Small but growing	Universities	Basic Research Applied Research
Educational	Small but growing	Schools Universities	Applied Research
Engineering	Small but growing	Corporations Universities	Applied Research
Environmental	Small	Universities	Applied Research
Forensic	Small but growing	Law enforcement	Applied Research
Gender	Small	Universities	Basic Research
Health	Small but growing	Hospitals Universities	Applied Research
Industrial - Organizational	Small but growing	Corporations Private practice Military	Applied Research
Learning	Small	Universities	Basic Research
Medical	Small but growing	Hospitals Universities	Applied Research
Personality	Small	Universities	Basic Research
Political	Small	Universities Campaigns	Applied Research
School	Small but growing	Schools Universities	Applied Research
Sensation & perception	Small	Universities	Basic Research
Social	Small	Universities	Basic Research
Sports	Small	Sports teams	Applied Research

UNIT 2: RESEARCH METHODS

QUESTION #2.1: What does psychology study?

Science observes variables. A **variable** is something that can change, and can be measured. (A **constant** is something that does not change.) Any report of scientific research should describe how the variables were measured. This constitutes the operational meaning of those variables. A good **operational definition** is one that can be measured precisely and is quantifiable. Operational definitions should also be valid and reliable, but that will be explained in the next chapter.

There are two types of variables: **dependent (observed effects)** and independent (usually understood to be the possible causes of those effects). In psychology, the dependent variable will always be some form of **behavior**. Going back to the stimulus and response model introduced in the first chapter, it can be said that in psychology, the dependent variable corresponds to the **response**. Here are some examples of dependent variables and their operational definitions.

ORGANISM	DEPENDENT VARIABLE	OPERATIONAL DEFINITION
Rat	Performance running a maze	Number of seconds it took to get through the maze
Voter	Attitude about a political candidate	Whom the voter says that she will vote for
Consumer	Decision to purchase a product	Whether or not the consumer purchases the product
Worker	Absenteeism	How many times last year the worker did not show up for a scheduled shift
Patient	Depression	Score on a valid and reliable depression scale

All decisions are dependent variables, but not all dependent variables are decisions (e.g., outcomes).

In psychology, whenever we are talking about actions, decisions, choices, attitudes, performance, or scores on tests, we are talking about dependent variables. Of course, each of these variables could also be seen as a cause of some other event further down the chain. The rat may receive a reward for running the maze quickly, the worker might get fired for his absenteeism. However, in psychology, the dependent variables are behaviors, not the later consequences of the behaviors.

Independent variables are the potential influences upon behavior. Some independent variables are **stimuli** coming in from the environment. Here are some examples of such independent variables.

ORGANISM	INDEPENDENT VARIABLE <i>(stimulus factor)</i>	DEPENDENT VARIABLE <i>(influenced by the independent variable)</i>
Rat	Shape of the maze	Performance running the maze
Voter	Campaign materials	Attitude about political candidate
Consumer	Advertisement	Decision to purchase a product
Worker	The surf report	Absenteeism
Patient	Death of his wife three months ago	Depression

All stimuli are independent variables, but not all independent variables are stimuli. Another type of independent variable would be something in the organism's background that also influences the organism's behavior. This can include hereditary factors or experiences during a formative time in the organism's life, such as early childhood.

ORGANISM	INDEPENDENT VARIABLE <i>(background factor)</i>	DEPENDENT VARIABLE <i>(influenced by the independent variable)</i>
Rat	Age of rat	Performance running a maze
Voter	Raised by parents who were strict Republicans	Attitude about a political candidate
Consumer	Female gender	Decision to purchase a product
Worker	His father was an alcoholic	Absenteeism
Patient	He was orphaned in childhood	Depression

The goal of science is to understand, predict, and control. Science tries to explain things in terms of cause and effect. Psychology is the science of behavior, so it tries to explain behavior in terms of independent and dependent variables. Here are examples of different kinds of predictor variables.

We call these predicted outcomes criterion variables. The topic of a study is usually defined by the **criterion** variable.

ORGANISM	PREDICTOR VARIABLE	DEPENDENT VARIABLE (outcome)
Rat	The rat ran the maze quickly yesterday DV: past performance	The rat will probably run the maze quickly again today
Voter	She voted Republican last time DV: previous decision	She will probably vote Republican again this year
Consumer	She is a woman IV: background	She will probably look for clothes in the women's section
Worker	His supervisor has evaluated him as "irresponsible" DV: past assessment	He will probably be absent more often than the other workers
Patient	He is now getting psychotherapy IV: treatment	Depression will probably subside in eight weeks

QUESTION #2.2: Whom does psychology study?

Psychology studies the behavior of people and animals. We use the term **subject** to describe the **person or animal (the organism)** whose behavior we are studying. We do not use the term subject to describe the topic of the study. (The topics are defined by variables studied.) We will use the terms *subject*, *participant*, *case*, and *organism* interchangeably in this book. So, a given subject could be a rat, a pigeon, a dog, a human patient, a worker, a voter, or a consumer.

The **population is the general class of subjects** we are studying. Examples of populations might be all rats of a certain species, all female consumers, all U.S. voters, all workers in a certain industry, all depressed patients. Any one particular member of such a population would be one subject.

Unless we are doing a complete census, we cannot directly observe all the members of a given population. We only get data from a few subjects. **A sample refers to the subjects actually observed.** Examples of samples would be: the rats ($n = 24$) which we observed running this particular maze, the voters ($n = 980$) whom we polled, the customers ($n = 123$) who registered their product purchases on the WalMart website, the workers ($n = 14$) on the dayshift in the shipping and receiving department, and patients ($n = 34$) receiving psychotherapy for depression at the clinic.

Science must get data from large and representative samples

SCIENCE
SYNTHESIZES
SUBSTANTIAL
SAMPLES

There are two essential features of good sampling. The first is an adequate sample size. In general, the larger the sample is, the more significant the data are. The second feature is that the sample be representative of the population. In general, a sample is representative of the larger population the sample and the population are similar on the most relevant background variables: gender, age, geography, etc.

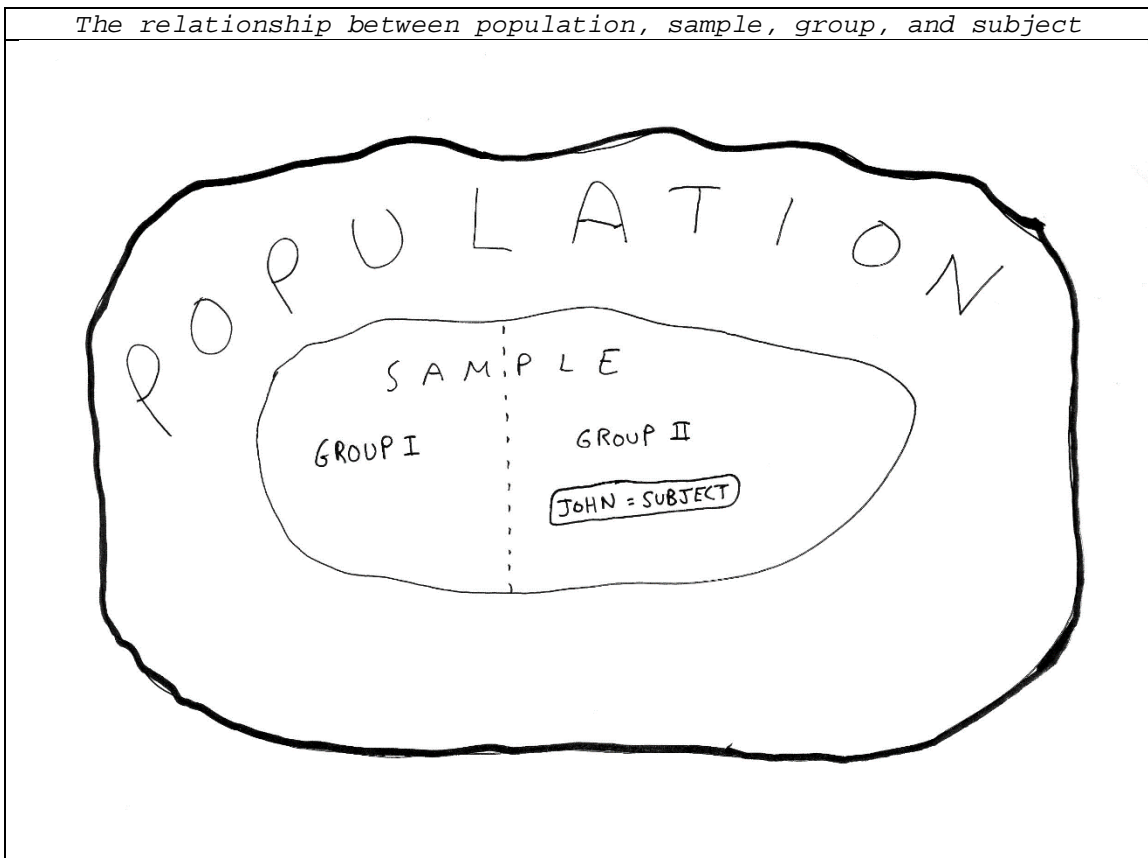
Representativeness is even more **important** than absolute size. If our sample of 980 voters all came from a gun show, we should not expect our sample to represent the population of U.S. voters on a topic such as gun control. If our sample of 123 clothing customers were all large sized women, that would not be representative of all the clothing customers who may have different clothes buying experiences and preferences.

One kind of sample that is rarely representative is when the subjects are self-selected. If we have a banner ad inviting people to go to our website to vote about social security benefits, those who respond will not be a representative sample of U.S. voters. People who are more motivated on this topic will be over-represented. People who are more fervent in their attitudes are more likely to participate. In the case of this example of social security benefits, few young people might be motivated enough to make the effort to call in, while many older persons living on social security would definitely want their views made known. (Some might even call in several times.)

The best form of sampling is random. That word should not imply "haphazard." **Random sampling** is done in such a way that each subject in the population has an equal chance to be included in the sample. Most student projects are not close to being random, but are **samples of convenience** using those subjects who were easiest to access (e.g., students walking across campus).

Some forms of psychological research take a sample and divide it into separate **groups** that are then compared. These groups may be defined by independent variables (e.g., male vs. female) or by allowing the subjects to self-select their grouping (e.g., Democrats vs. Republicans) in which case the grouping would be done on the basis of a dependent variable.

<i>Part / Whole Relationships</i>				
P O P U L A T I O N	S	First group (women)	Sally Jones (one subject)	
			Maria Garcia (one subject)	
			Betty Williams (one subject)	
			Michelle Nguyen (one subject)	
	E	Second group (men)	Bob Smith (one subject)	
			Juan Gonzalez (one subject)	
			Bill Johnson (one subject)	
			Eric Wong (one subject)	
				Subjects not observed

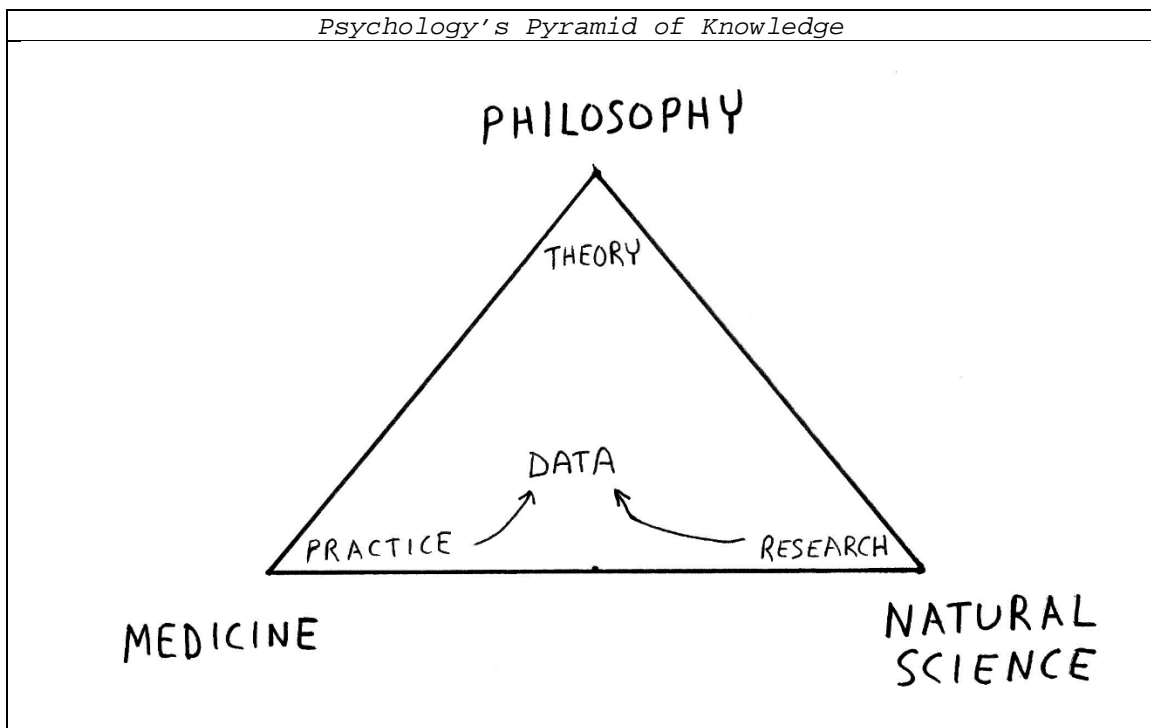


QUESTION #2.3: How does psychology study behavior?

Most psychological research begins with a specific question. Usually that question is based upon some theoretical or assumed relationship between variables, and generates a specific prediction. A **hypothesis** (plural hypotheses) is what we call a **specific prediction** that guides research. The purpose of research is to gather data that can test the hypothesis. The hypothesis is to research what diagnosis is to clinical work: a starting point for the treatment proposed at present, based upon a past fund of knowledge, and confirmed (or not confirmed) by future results.

GRAMMAR LESSON: The word *hypothesis* is singular. The plural is *hypotheses*. The adjective would be *hypothetical*.

Visualize the triangular field of psychology as a pyramid of knowledge. The base of the pyramid must be larger than the capstone. The base of the pyramid is formed by the data, while the capstone is theory. When research supports a hypothesis consistent with a theory, that theory is supported by the data.



There are four major forms of [psychological research](#): introspection, the case study, the correlational survey, and the experiment.

Introspection means self-reflection, looking within at our own thoughts, emotions, and behaviors. This is the oldest form of psychological research, going back to when the first human exercised these powers of self-reflection, asking "Why do I do what I do? think what I think? feel what I feel?" Each of us has used introspection as starting point for our ideas on human behavior, but few of us have been as systematic as the great theologian **Augustine** (354-430 C.E.) in his autobiography. Even as late as a hundred years ago, introspection was still the major research technique in academic psychology, used by Wundt, Titchener, James, and Calkins. Although these 19th century psychologists developed many sophisticated guidelines for improving introspection, it was **rejected by Watson** as being insufficiently scientific for what he hoped psychology would become: a laboratory science.

There are several limitations to introspection. First, and foremost, is that of bias. The observer (the psychological researcher) is also the observed. People may not report what they are really feeling or thinking, but what they prefer to imagine that they were thinking or feeling (or what they think will present themselves in the best light in front of others who may be reading their research).

GRAMMAR LESSON: *Bias* is the singular noun, not *biasness*. The plural is *biases*. *Bias* is also a verb. Its adjectival form requires the *ed* and becomes *biased*. So, do not say "He was bias" but "He was biased" or "He had bias."

A related problem is that the observation may change what is being observed. When someone knows that he is looking at (and attempting to record) his own thoughts, that very process might alter those thoughts, changing the course of the stream of consciousness. Thinking about your thoughts changes what you are thinking about.

Another problem is that the sample size ($n = 1$) is too small and not representative: Augustine may have given us a great example of his self-reflection, but he was a genius and a saint, titles to which most of us may only aspire.

We must agree with Watson on one point: introspection proves nothing, at least in the sense that it cannot establish a cause and effect relationship between the emotions, thoughts, and actions that emerge in our minds. However, Watson may have been too quick to completely reject introspection from modern academic psychology. While introspection cannot test hypotheses, it may generate a hypothesis that could then be tested by some other research method.

The case study is an in-depth study of one particular subject. The individual in question might be a famous person, and so the case study would be a biography that gives an account of the subject's background and later behavior. In clinical psychology case studies are frequently done on individual patients, describing the initial presentation of symptoms, psychometric assessment, relevant background, diagnosis, course of treatment, and outcomes.

Unfortunately, the case study has some of the same limitations that we find in introspection. Most obvious is the limited sample size ($n = 1$). Neither is the sample usually representative. Biographies are usually written on the most famous persons of the past, due to their great accomplishments (e.g., Leonardo da Vinci) or the great evil they have done (e.g., Hitler). Such individuals are not typical of even their own times and cultures, let alone the entire human race.

Even the problem of selective observation and bias is present in case studies. The person who wrote up the case study (e.g., Freud) may have looked for certain things that fit a certain theory, and ignored those data that did not fit.

Case studies, like introspection, prove nothing in the sense that they cannot establish a cause and effect relationship between the events in a person's life: merely a record of what happened next. However, while case studies cannot test hypotheses, they may be yet another source of hypotheses which would then have to be tested by some other research method. The other great use of case studies, especially within the clinical branch of psychology, is that they serve to illustrate how to do something: diagnosis, treatment, etc.

Surveys measure several variables in a large sample, and then attempt to find a relationship (correlation) between the variables. There are several ways that surveys can be done. Most questionnaires are surveys, but most surveys do not involve questionnaires.

Perhaps the easiest way to gather data is to look in **archives** such as patient records or job applications. One of my students was a certified nursing assistant at a convalescent hospital. She started off with the hypothesis that most of the combative patients were that way because they had suffered left hemisphere strokes that had diminished their ability to express themselves verbally. She got permission to look through the records of the patients ($n = 98$) and recorded two variables for each patient: did the patient have a left hemisphere stroke (IV, an organismic background factor), and was the patient classified by the staff as combative (DV, an evaluation of patient behavior). She found that among the patients with the left hemisphere strokes ($n = 20$), most were labeled as combative, but few of the other patients ($n = 78$) had been so labeled (even the ones with right hemisphere strokes).

Field counts are another way to do a survey. One student who worked at a cineplex counted the number of customers ($n = 326$) waiting in line for two different movies: an action picture and a romantic comedy. He measured two variables for each subject: gender (IV) and choice of movie (DV). He confirmed his hypothesis that a higher percentage of the males were going to see the action picture, while a higher percentage of the females were going to see the romantic comedy.

Trace studies do not look at the subjects or their behavior directly, but from some of the results of those behaviors. In trying to see which of two museum exhibits was more popular, we might look at the patterns of worn floor tiles and infer that one exhibit had more visitors.

Questionnaires are one of the hardest ways to do surveys. You have to phrase the questions clearly, phrase the responses in quantifiable format, find a potential sample, distribute the questionnaires, get the questionnaires back, eliminate the responses that are inappropriate, and then tabulate the remaining data.

<i>Ways to do a survey</i>	
Type of survey	Examples
Archival data	Patient records, employee records
Field count	Count the customers in line
Trace Study	Bird droppings show where birds were
Questionnaire	Product warranty registration form

One problem particularly with orally administered questionnaires is that of **demand effect** (also known as *courtesy bias*). The subjects may answer in such a way as to try to please the questioner. In the wake of the 1992 Los Angeles riots, two of my students (a White woman and a Black woman) went around asking students what they thought about the verdict acquitting the four police officers who had beaten Rodney King. About half of the White subjects questioned by the White investigator thought that the verdict was justified, but none of the White subjects who were questioned by the African-American researcher expressed that view.

Until you become skilled with all of these aspects of questionnaires, it is probably best to keep your questionnaires short, and distribute them only among highly cooperative samples (e.g., students walking across campus).

When done well, surveys avoid most of the problems of introspection and case studies. The samples can be large and representative. Confusion can be reduced by careful phrasing of the questions. (See the examples below.) If we can clearly identify which variables are independent before we conduct the research, and fully account for the influence of other potential independent variables (confounding variables), a survey might suggest some causal relationships.

This is an anonymous questionnaire, so please do not write your name on this sheet. For each of the following questions, please CIRCLE the response which best describes you or your opinions.

What is your gender? **MALE FEMALE**

How old are you? **UNDER 25 25 OR OVER**

What is your present marital status?

MARRIED WIDOWED DIVORCED NEVER MARRIED

Are you a parent or step-parent? **YES NO**

Compared to your brothers and sisters, are you

OLDEST YOUNGEST IN THE MIDDLE AN ONLY CHILD

How often do you ...

ALWAYS USUALLY HALF THE TIME SELDOM NEVER

How often have you ...

NEVER ONCE SEVERAL TIMES MANY TIMES

Would you describe yourself as ...

EXTREMELY VERY SOMEWHAT SLIGHTLY NOT AT ALL

Is it true that ...

DEFINITELY PROBABLY POSSIBLY NO WAY

Do you agree that ...

**STRONGLY AGREE MOSTLY DISAGREE
NOT SURE
MOSTLY AGREE STRONGLY DISAGREE**

How likely is it that ...

**VERY SOMEWHAT SOMEWHAT VERY
LIKELY LIKELY UNLIKELY UNLIKELY**

How would you rate ...

EXCELLENT GOOD FAIR POOR

An **experiment** is research in which the independent variable is intentionally manipulated by the investigator. Experiments can be done in the artificial environment of a laboratory, or in "the field" of real life such as a workplace or store. As in a survey, the sample should be large and representative of the population, and the dependent variables should be measured precisely. The major difference between a survey and an experiment is that a survey just measures the variables, while an experiment takes an independent variable and then manipulates it. The end result is that the experiment is the best way to infer a cause and effect relationship between the variables.

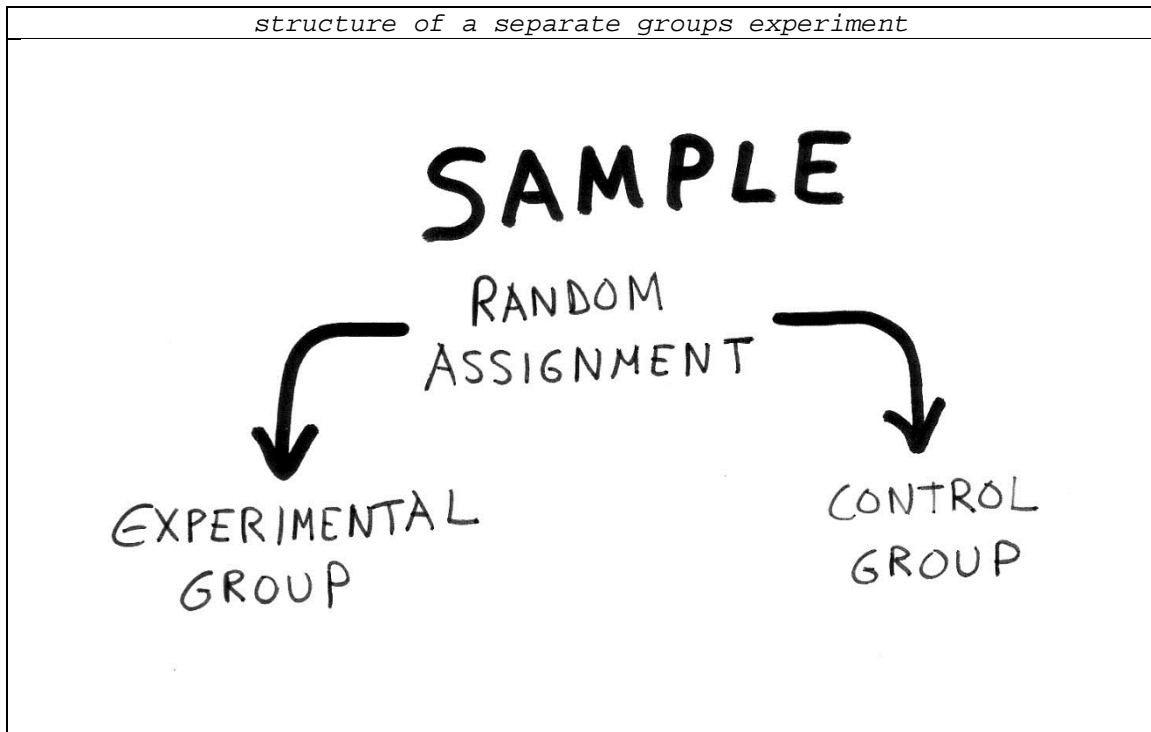
ORGANISMS	INDEPENDENT VARIABLE <i>(manipulated)</i>	DEPENDENT VARIABLE
Rats	Half of the rats ran at a lower temperature	Rats ran faster at 60 degrees than at 90 degrees
Voters	Two different ads ran in comparable counties	Voter turnout was lower with the attack ad
Consumers	Two stores had different displays of the same product	One store had higher sales of that product
Workers	A new policy is instituted: good attendance rewarded with flex time	Absenteeism declines under new policy
Patients	Half of the patients are required to do aerobic exercise	Depression is lower in the exercise group

Suppose you have a hypothesis: students who work with computer drills (predictor variable) will score higher on the final exam (outcome variable). A survey could be done, just asking the students to indicate on their final exams how often they worked with the computer drills. Suppose we found out that the students who used the computer drills scored much higher on their final exams than did the students who did not use those drills. However, since this was only a survey, and not an experiment, we must be cautious about interpreting cause and effect relationships. The scores on the final exam were clearly a dependent variable, a measure of students' performance, but so was the other variable, whether or not students chose to use the computer drills. We may have simply shown a relationship between two dependent variables. Students who do better on the final exam may have a number of characteristics that differentiate them from students who do poorly on the final: greater use of computer drills, more frequent church attendance, fewer speeding tickets, and fewer tattoos. While these might help me predict who is more likely to do well in the course, I should not infer that any of these other measures of student choice or performance actually causes exam scores to be higher or lower.

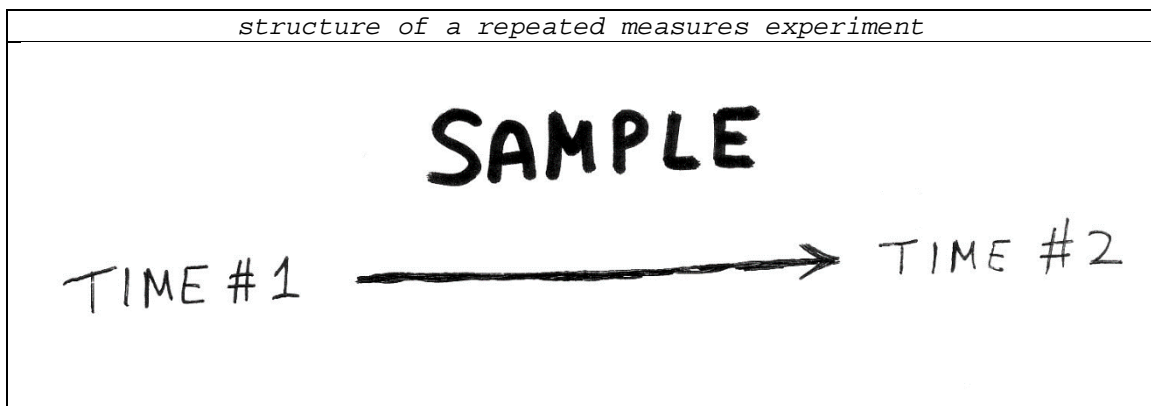
Now, let's test that same hypothesis with an experiment. One group, the **experimental** group, is forced to use the computer drills. The other group, the **control** group, is prevented from using the computer drills. We measure the dependent variable in the same way: scores on the final exam, but now we must treat the computer drills as an independent variable to be manipulated. One of the easiest ways to do this is to have two separate groups, and **random assignment** of the subjects to those groups. This means that each subject in the sample has an equal chance of winding up in the experimental group. Each subject is therefore assigned (independently of his or her own choice or preference) to one of those groups. The random assignment serves to balance out some of the other background variables, such as previous academic preparation or socio-economic class that could have confounded our results. Now, if the two groups differ significantly in their final exam performance, we may attribute that difference to the computer drills alone.

Research that uses pre-established groups (e.g., a morning section of psychology vs. an afternoon section) does not use random assignment, and may be influenced by those confounding variables that differentiate the two existing groups. Such designs using non-random groups are usually called **quasi-experiments**.

GRAMMAR LESSON: The group not receiving the experimental treatment is known as the *control group*, not the *controlled group*.



Another way to conduct an experiment is with a repeated measures (before vs. after) design. The entire sample is measured on the dependent variable in the control condition, then the independent variable is manipulated, and the entire sample is measured again on the dependent variable under the experimental condition. While this design has some advantages, it is vulnerable to practice, fatigue, or the natural course of development or disorders. For example, if we took a hundred patients who had been recently diagnosed with depression, measured their level of depression (which would be high), and then forced all of them to rap three hours a day for the next two months (the independent variable manipulated), and then measured the depression level again (the average score would be lower). However, this repeated measures design ignored another important variable: the natural course of depression. Most depressed patients will improve somewhat in two months, even when no effective treatment is provided.



A better approach in psychiatric research is to use a separate groups design with random assignment. Suppose that the independent variable to be manipulated is the treatment. Each subject should have an equal chance of winding up in the experimental group. In medication studies, the experimental group would get the new medication, while the control group would be getting a **placebo (a pill containing an inert substance)**. In a **double blind study**, neither the patients, nor the researchers observing the patients' levels of depression should know which patients are getting the medication and which are getting the placebo. If the experimental treatment is to sing rap songs, perhaps the control group should have to sing some other kind of music. If after two months there is no significant difference in the depression levels between the two groups, then we would have to conclude that there is nothing special about rap, at least when it comes to depression levels.

One problem often found with experiments (as well as other forms of research) is known as the **Hawthorne Effect**. In one study done about a hundred years ago, assembly workers seemed to increase their production regardless of the type of experimental manipulation to which they were subjected. Subsequent analysis of the study concluded that the workers were responding mostly to the attention that the researchers gave them.

So, Hawthorne effect refers to the fact that the very process of observing a behavior can influence that behavior.

<i>How research techniques meet scientific standards</i>				
	INTROSPECTION	CASE STUDY	SURVEY	EXPERIMENT
<i>Empirical</i>	?	YES	YES	YES
<i>Objective</i>	NO	?	YES	YES
<i>Quantifiable</i>	NO	NO	YES	YES
<i>Can Infer a Cause-Effect Relationship</i>	NO	NO	?	YES

Whatever research technique we select, we must make sure that each variable has been taken care of in one of the following ways: measurement, manipulation, control or randomization. The most common technique is to **measure** the variable with a valid and reliable operational definition. It is helpful to get a scale of measurement so that most of the subjects are scoring toward the middle. For example, if a test is too easy, and most of the subjects score near the top of the scale, that is known as **ceiling effect**. If a test is too hard, and most of the subjects score near the bottom of the scale, that is known as **floor effect**. Both ceiling and floor effects complicate the statistics and make it harder for the research to be significant.

Dependent variables must be measured, whereas independent variables can be measured, or dealt with in the following four ways. We can **manipulate** the variable by making it vary in a manner independently of the choice of the subjects. The easiest way to do this is usually in the form of randomly assigned grouping. (Manipulation of an independent variable makes the research an experiment.) Another option is to **control** the variable by turning it into a constant. The easiest way to do this is through selective sampling (e.g., control gender by only including women in the sample) or by proportionate assignment (e.g., include the same proportion of men and women in both the experimental and control groups). If we have a large enough sample (and random selection and assignment), we can assume **randomization** of background variables (which means the impact of those variables will probably cancel out).

Independent variables that are not sufficiently measured, manipulated, controlled or randomized become **confounding variables** which means that they limit how we can make causal inferences. Another name for confounding variables would be third variables or extraneous variables.

QUESTION #2.4: What are the major ethical guidelines in the study of behavior?

When psychologists treat patients, help clients, or perform research on subjects, there are important **ethical guidelines** to be followed.

With human subjects, there are guidelines about the subject's right to privacy. In some cases there are requirements for **anonymity** which means

that not even the researcher should know the identity of the subject. **Confidentiality** means the researchers should not disclose the identity of the subjects. Someone reading a case study of a patient should not be able to infer that the 46-year-old male divorced accountant is really Mr. Jones down the street. Many hospitals, companies, and schools have internal review boards or written policies which limit what kinds of data can be used in research. So, before you start distributing your questionnaire around the office, or sifting through the employment records, make sure that your research is permitted.

Another ethical concern with human subjects is that of **informed consent**. Each participant should have a clear idea of what he or she is getting into when agreeing to fill out a questionnaire or be subjected to the manipulation of the independent variable. Ideally, the participant should also have the ability to quit the research at any point. One great limitation of this guideline is that many of the subjects that psychology is most interested in (e.g., children, the mentally ill) might be incapable of fully comprehending the ramifications of their participation in the research. It is not settled whether the subjects of an archival study must give formal consent before their data can be analyzed: the organization accumulating the data may have had a legitimate right to do so. It is doubtful that subjects in a field count have to give formal consent, if the data are based upon public behaviors.

Yet another limitation of informed consent is that certain experiments necessarily involve some degree of **deception** of the subjects because if they really knew what the research was really about, that would affect the responses. It may be necessary to lead participants to think that the research is about one variable (e.g., attitudes about the qualifications of job applicants) when actually it is about another variable (e.g., discrimination based upon the gender or ethnicity of the job applicants).

A related guideline is **debriefing**. After the research has been completed, subjects should have the opportunity to learn about the results. If the subject has experienced any stress due to the research process, he or she should have an opportunity to get some counseling in order to overcome those problems.

Another guideline is **lack of coercion**. Subjects should not be forced to participate in the research. Prisoners should not be promised special consideration in parole hearings for their agreement to participate in dangerous experiments. Even students in psychology courses should not be required to participate in research as part of their grades, but should be given alternative ways of meeting course requirements.

With all research subjects, human and animal, there is a need to **minimize harmful consequences**: risks, dangers, suffering, even embarrassment. Perhaps the classic example of where this criterion was not followed was in the Tuskegee syphilis study. The long term effects of untreated syphilis on a White population were widely known: damage to a variety of organ systems is possible. (About ten percent would get a form of syphilis-related dementia known as general paresis.) In 1932 a study was organized by the U.S. Public Health Service in order to study the long term effects of syphilis on African-American males. During World War II, penicillin was discovered to be an effective cure

for syphilis, but over the next thirty years, administrators made the decision to withhold such treatment from the participants in order to maintain the original purpose of a long term study of untreated syphilis on Blacks men.

The concern for minimizing risk to human subjects is one reason why many topics in psychology (e.g., loss of parents at an early age, brain damage) cannot be studied by experiments on human subjects. These topics can only be studied by surveys (which are not as good at eliminating the possible confounding independent variables) or by experiments on animals. Indeed, one of the most controversial areas of scientific research is the justifiability of the pain (and even death) given to the more than twenty million animal subjects each year in U.S. laboratories.

Research on	
<i>Researcher(s)</i>	U.S. Public Health Service 1932-1972
<i>Subjects</i>	African-American males in Alabama
<i>Type of research</i>	Longitudinal survey to track the course of untreated syphilis
<i>Independent Variable(s)</i>	Age, length of time infected
<i>Factors held Constant</i>	Ethnicity, gender, diagnosis of syphilis
<i>Dependent Variable(s)</i>	Symptoms throughout the course of the untreated disease
<i>Results</i>	About ten percent developed general paresis (dementia due to tertiary syphilis)
<i>Ethical Considerations</i>	Ten years into the study, penicillin had been developed, and the patients could have been cured, but that would have interfered with the original goal of the study
<i>Conclusion</i>	The disease has similar results for African-Americans as it does for Caucasians

UNIT 3: STATISTICS

QUESTION #3.1: What is role of statistics in psychology?

Math and science go together. **Descriptive statistics are measurements about variables in groups, samples or populations.** A variable can be described by its central tendency (mean, median, mode, percentage) or dispersion (variance, standard deviation, range). Here are examples where simple descriptive statistics could be used to summarize the results of experiments.

SUBJECTS	INDEPENDENT VARIABLE <i>(manipulated)</i>	DEPENDENT VARIABLE <i>(precisely measured)</i>
Rats	Half of the rats ran at a lower temperature	Rats ran faster at the lower temperature: a mean of 45.5 seconds at 60 degrees versus a mean of 52.8 seconds at 90 degrees
Voters	Two different ads ran in comparable counties	Voter turnout was lower with the attack ad: 54.4% vs. 65.1% without
Consumers	Two stores had different displays of the same product	One store had higher sales: 34% increase vs. only a 3% increase
Workers	A new policy is instituted: good attendance rewarded with flex time	Absenteeism declined under new policy: from a median of 6 per month to only 2 per month
Patients	Half of the patients are required to do aerobic exercise	Depression is lower in the exercise group: a mean CES-D score of 38.7 vs. 51.6 points

QUESTION #3.2: What is a correlation?

Correlation describes the association between two variables (or two measures of the same variable). The direction of a correlation may be positive, negative, or zero.

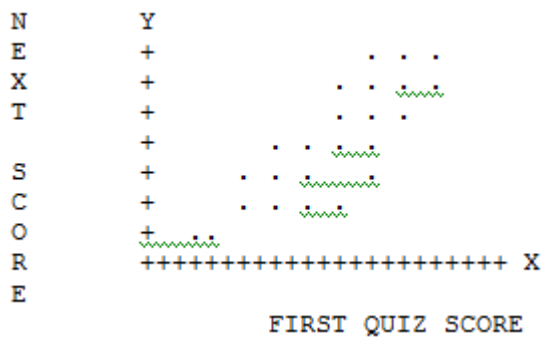
GRAMMAR LESSON: In this class, do not use “positive” to mean good or “negative” to mean bad.

Math You Need for this Course

Symbol	<i>What it means</i>
=	Equals
>	The thing on the left is greater than the thing on the right
<	The thing on the left is less than the thing on the right
r	Stands for correlation : the association between variables
+	Positive, direct relationship between the variables
	If one goes up, the other goes up.
	If one goes down, the other goes down.
-	Negative, inverse relationship between the variables
	If one goes up, the other goes down.
r > .60	High correlation, strong trend, few exceptions
Between .2 & .6	Moderate correlation, some exceptions to the trend
r < .20	Low correlation, weak trend, many exceptions
0.00	No correlation, no relationship between variables
Null	Hypothesis that there is no real difference between groups, no real correlation between variables; chance explains data variations
Reject	Rejecting the null means that we cannot attribute the resulting data to random variation, so we proved something (but we have to figure out what)
p	Probability of the null hypothesis being consistent with these data
p > .10	Data are not significant
p < .10	Data have marginal significance
p < .05	Data have fair significance, reject the null
p < .01	Data have good significance, reject the null
P < .001	Data have excellent significance, reject the null
E-0	Scientific Notation : move the decimal point to the left
E-02	Put one zero between decimal and first number 7.65E-02 = .0765 (significance is marginal , or fair if < .05)
E-03	Put two zeros between the decimal and first number 1.34E-03 = .00134 (significance is good)
E-04	Put three zeros between the decimal and first number 1.34E-04 = .000134 (significance is excellent)

A **positive correlation is a direct relationship** between the two variables. (We never use the words *good* or *bad* to describe a correlation.) A direct relationship means that if a given subject scores high on one variable, he is likely to score high on the other variable; and if a subject scores low on one variable he is likely to score low on the other variable.

For an example of a direct correlation, students who tend to score high on the first quiz, tend to be the same ones who get the higher scores on the second quiz. When each variable can be measured on an interval scale, we can use a graph known as a **bivariate scatterplot**. Each subject appears as one data point. The **X** axis represents that subject's score on the X variable, while the **Y** axis represents that subject's score on the Y variable.

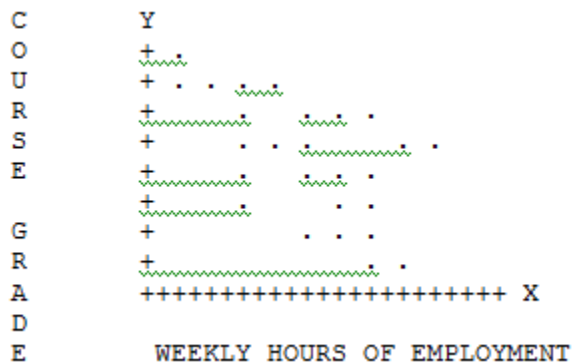


The two-by-two **contingency table** is another diagram for showing correlation, especially in categorical variables (e.g., male-female, yes/no, pass/fail, experimental/control). Here is an example of the direct correlation between whether workers had undergone special safety training and whether these workers passed a test on safety. Out of the fifty workers in the sample, twenty were selected for safety training, and thirty served as controls (independent variable). When all the workers were given a knowledge test related to safety, most of the trained workers passed, while most of the untrained workers failed (dependent variable). There was a direct correlation between the variables of training and passing the test because the trained workers were more likely to pass.

Positive correlation				
		VARIABLE TWO: safety test		totals
		passed	failed	
V A R I A B L E O N E	training	15	5	20
	No training	10	20	30
Totals		25	25	N = 50

Negative correlations occur when subjects who score high on one variable tend to score low on the other variable. Another name for this relationship is **inverse**. (We never use the words "good" or "bad" to describe a correlation.)

For example, students who tend to work more hours at their place of employment, tend to get lower grades. Here is a bivariate scatterplot demonstrating that inverse relationship.

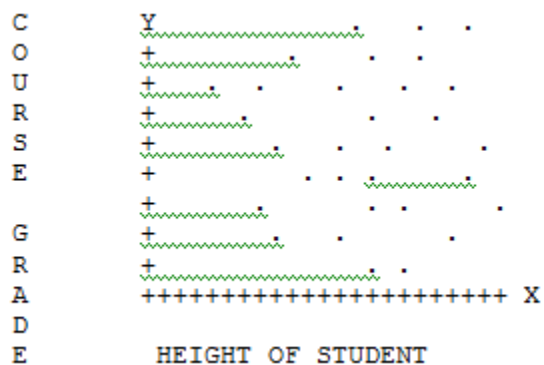


Here is another example of an inverse correlation: workers who completed safety training were less likely to be involved in an industrial accident during the following year. We can use a two-by-two contingency table to describe this relationship.

Negative correlation				
		VARIABLE TWO: accident?		totals
		yes	No	
V A R I A B L E O N E	training	1	19	20
	No training	4	26	30
Totals		5	45	N = 50

A **zero correlation** is one in which there is **no relationship** between the variables observed. If you choose any two variables at random (say, the price of beans at the local grocery store, and whether or not the Dodgers will win the World Series) there will most likely be no relationship between them, a zero correlation. When the correlation is zero, there is no way that we could use a knowledge about a subject's score on one variable to predict what kind of score that subject would have on the other variable.

Here is the way that a zero correlation looks on a bivariate scatterplot: no trend between how tall a student is and how well the student does in the course. So, there is no way that I can size up the students on the first day of class and predict who will be the A students.



Here is what a zero correlation looks like on a two-by-two contingency table showing a zero correlation between whether workers wear glasses and whether or not they have an accident.

Zero correlation					
		VARIABLE TWO: accident?			
		Yes	No	totals	
V A R I A B L E	Wears Eye Glasses	2 10%	18	20	
	Does NOT Wear Eye Glasses	3 10%	27	30	
O N E		Totals	5	45	N = 50

Notice that ten percent of workers have accidents, whether or not they wear glasses, so there is no way that I could look at whether or not a worker wears glasses in order to predict a higher (or lower) risk of accident.

QUESTION #3.3: How is the strength of a correlation measured?

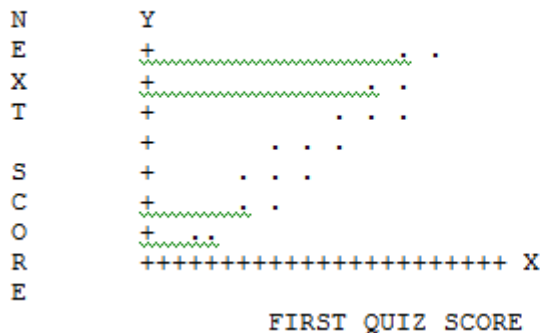
A correlation coefficient is a number with a theoretical range between -1.00 and +1.00 (but remember: the negative or positive sign just tells us the direction of the relationship). **The closer to zero, the weaker the relationship, the closer to 1.00 (+ 1.00 or -1.00) the stronger the relationship between the variables.** Here is a rough guide to words describing the strength of different coefficients.

+1.00	perfect positive	no exceptions to trend
<u>high</u>	strong positive	few exceptions to trend
+0.60	moderate positive	some exceptions to trend
+0.20	low weak positive	many exceptions to trend
0.00	low weak negative	many exceptions to trend
-0.20	moderate negative	some exceptions to trend
-0.60	<u>high</u> strong negative	few exceptions to trend
-1.00	perfect negative	no exceptions to trend

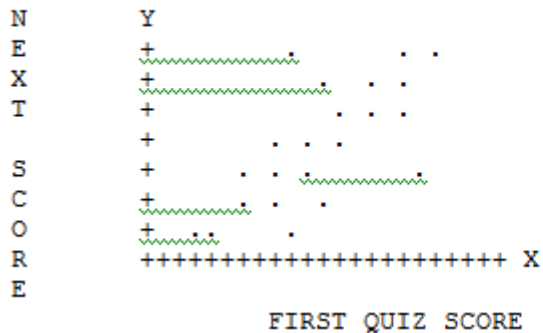
These cut offs are not hard and fast. In experimental psychology, it is more common to find correlations above .6 (positive or negative) than it is in industrial psychology. This is because much of the research in experimental psychology takes place in the confines of the laboratory where the impact of extraneous independent variables can be controlled, while in the open environment of the workplace, there are many more influences on the subjects' performance, and these [confounding variables](#) create more exceptions to the trend, hence, weaker correlations.

When dealing with bivariate scatterplots, the strength of the correlation tells us how closely the individual data points approximate a theoretical regression line that expresses the general trend of the data points. (The exact slope and intercept of the regression line are separate calculations.)

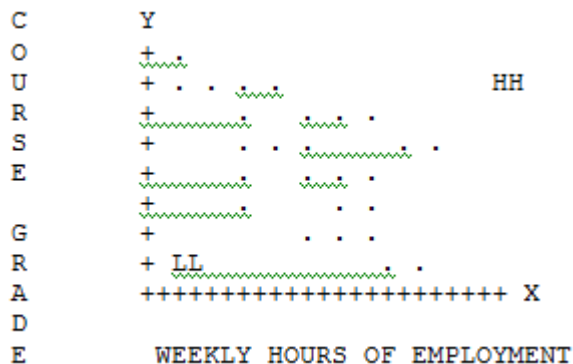
HERE IS A STRONG POSITIVE CORRELATION, MOST POINTS ARE CLOSE TO A LINE



HERE IS ONLY A MODERATE POSITIVE CORRELATION, THERE ARE MORE EXCEPTIONS



Return to our example of the inverse relationship between students working and getting a good grade in the course. Perhaps you thought to yourself, "but that doesn't fit everyone. I know one really lazy guy who doesn't even have a job, and he still flunks, while I work forty hours a week and get a B." You are right: there are some exceptions to the trend, like Lazy Larry and Hardworking Harry, which means that the correlation is only moderate, and not strong.



In using a two-by-two contingency table, high positive correlations have most of the subjects ending up in cells A and D, while high negative correlations have most of the subjects ending up in cells B and C. We know that the table below represents a positive correlation because most of the subjects ended up in cells A and D. The exceptions to the trend occurred in cells B and C. One quick way of estimating the strength of such a correlation is to put the percentage of the trained group ($n = 20$) who passed the test in cell A, and put the percentage of the untrained group ($n = 30$) in cell C, and then subtract C from A. So, this correlation is only moderate, about .4. (The actual formulas used for calculating correlations can wait until you have a class in statistics. One of the most commonly used is the Pearson product moment coefficient, and is symbolized by the small letter r .)

Moderate correlation				
		VARIABLE TWO: safety test		
		Passed	failed	totals
VARIABLE	training	A 15 75% TREND	B 5 25% EXCEPTIONS	20
	No training	C 10 33% EXCEPTIONS	D 20 67% TREND	30
Totals		25	25	N = 50

In a perfect positive correlation of +1.00, all of the trained workers would pass the test, and none of the untrained workers would pass the test: no exceptions to that trend. Cells B and C would be empty.

QUESTION #3.4: What is reliability?

Reliability means consistency of measurement. This is especially important in standardized psychological tests, but reliability is a criterion for any operational measure of a variable. Imagine a twelve-inch ruler made out of elastic instead of wood. One carpenter might measure a board as being 5 inches, but another carpenter using the same ruler might stretch it a little less and determine that the board was 6 inches. This kind of inconsistency is not tolerable in science. When one clinical psychologist says that a patient is depressed, she should be using the same standards as those used by a psychiatrist in a different city.

Correlation coefficients are a useful way to determine just how reliable psychological measurements are. Reliable tests have high correlation coefficients. Most of the patients end up in cells A and D where there is agreement between the first measure of the test and the second measure, and there are very few disagreements in cells B and C.

One form of reliability is **inter-rater**. Two different raters (e.g., judges, interviewers, diagnosticians) evaluate the same subjects on the same variable. For example, the first measure might be the diagnostic judgment of one clinical psychologist, and the second measure might be the diagnostic judgment of a psychiatrist. Both mental health professionals are using the same test in order to determine if each of the twenty patients has a certain disorder. Suppose that the psychologist diagnoses 10 out of twenty patients as having the mental disorder, while the psychiatrist only finds that 8 patients have the disorder (all of whom were also diagnosed by the first psychologist). Both diagnosticians agree that ten patients do not have the

disorder. The only real disagreement is on two patients: the first psychologist says that these patients have the disorder, but the second psychologist says that they do not have the disorder. The correlation here is high, about +.8 because there are very few exceptions to the trend of agreement about the diagnoses.

Inter-rater Reliability				
		SECOND RATER says patient		totals
		Has disorder	Does NOT	
F I R S T R A T E R	patient has the disorder	A 8 AGREEMENT	B 2 DISAGREEMENT	10
	Patient does NOT Have the Disorder	C 0 DISAGREEMENT	D 10 AGREEMENT	10
Totals		8	12	N = 20

Another form of reliability is **test-retest**. The subject is given the same test twice to see if he scores consistently. Suppose this is a test of personality that classifies subjects as introverts or extraverts. If the test is reliable, we should not see a subject looking like an introvert this week and looking like an extravert next week.

Test-retest Reliability				
		SECOND TEST says patient		totals
		Introvert	Extravert	
F I R S T T E S T	Introvert	A 30 AGREEMENT	B 0 DISAGREEMENT	30
	Extravert	C 0 DISAGREEMENT	D 20 AGREEMENT	10
Totals		30	20	N = 50

Suppose fifty subjects take the personality test, resulting in 30 being classified as extraverts and 20 as introverts. A week later everybody takes the same test again, and gets the same classification. There are no exceptions to the trend. That is perfect consistency, a reliability coefficient of +1.00.

Other forms of reliability include **alternate (parallel) forms** in which there might be two slightly different versions of the same test, and **internal reliability** in which we look at the different parts of a test and make sure that each part is really measuring the same thing as the other parts of the test.

<i>Establishing the reliability of a test</i>	
Type of reliability	Research involved
Test-retest	Give the test twice to each subject; Correlate first administration to the second
Inter-rater	Have two judges evaluate each subject; Correlate the first ratings to the second
Alternate form	Give two versions of the test to each subject; Correlate the first version to the second
Internal	Give the entire test to each subject; Correlate one part of the test to the rest of it

QUESTION #3.5: What is validity?

Validity means that a measurement actually measures the variable that it claims to measure (and not some other variable that might be easier to measure). Validity is especially important in standardized psychological tests, but validity is a criterion for any operational measure of a variable. Validity and reliability are both important for psychological measures, but they are not the same thing. Imagine that you need to weigh a brick, and someone brings out a ruler. That ruler may measure very reliably (consistently) but what it measures is how long the brick is, not how heavy the brick is (which is what we need to measure now).

One of the biggest problems in psychological research is using the wrong tests to measure variables: using a life satisfaction scale to measure clinical depression, using a test of childhood minimal brain dysfunction for senile dementia, or using an IQ test to determine if a job applicant has the aptitude to learn a certain job skill.

Correlation coefficients are useful in describing how valid a test is. In order to validate a new test, we must correlate it to some pre-established standard measure of that variable. (Just like if we wanted to see if a watch kept the correct time, we would have to compare it with the official government clock.)

Suppose a medical clinic wants to develop a brief scale to screen patients for depression. The established standard for diagnosing depression is given in the **Diagnostic and Statistical Manual (DSM)** of the American Psychiatric Association, so the results of the new test must be correlated with those of a formal diagnosis following the DSM standards.

Suppose we give the new test to the next hundred patients at a general practice medical clinic. Each of these patients then sees a clinical psychologist who does a complete, formal assessment for depression following the DSM. The results indicate that the new test labeled twenty patients as depressed, but the DSM found that only ten were really depressed.

Validating a test				
		ESTABLISHED MEASURE (DSM)		
		Depressed	NOT Depressed	totals
N E W T E S T	Patient is Depressed	A 10 TRUE POSITIVE	B 10 FALSE POSITIVE	20
	Patient is NOT Depressed	C 0 FALSE NEGATIVE	D 80 TRUE NEGATIVE	80
Totals		10	90	N = 100

The strength of the correlation coefficient between these variables is one important factor in the decision whether or not to use the new test. If there were no exceptions ($r = +1.00$) we could say that the new test had a perfect predictive value. In practice, few psychological tests even come close to this level of validity.

It is also important to note what kind of errors the test is making: false positives and/or false negatives. In the example above, there were no **false negatives** (patients who were really depressed, but the test did not identify them as such). So, if a patient were depressed, the test would be sensitive enough to point that out. However, this new test had a high rate of **false positives** (patients who scored high on the test even though they were really not depressed). So, given these rates of false positives and false negatives, here is how the new test could be used: patients who score low are clearly not depressed, so they do not have to be tested for depression by the psychologist, but patients who score high need to be referred for further diagnostic assessment to confirm that they are really depressed (rather than false positives) before we place them into some form of treatment.

GRAMMAR LESSON: Do not use the words *accurate* or *accuracy* in this class. Figure out which of the following concepts you want to convey: precision, reliability or validity.

QUESTION #3.6: What is statistical significance?

Significance is our level of confidence that the data really prove something. Psychology and other sciences do this by using a branch of statistics known as **inferential statistics**. The most widely used technique is known as null hypothesis testing (though other approaches to inferential statistics are emerging).

The **null hypothesis** states that the data observed in our sample could have been produced by chance variation (and therefore we proved nothing). Maybe there was a slight difference in mean performance between the experimental group and the control group, but that could be attributed to random variation. Maybe there was a slight difference in the percentage of Alzheimer patients who were clinically confused before and after starting a memory training program, but that difference could be attributed to random variation. Maybe there was a weak positive correlation between how much sugar children consumed and how violent they were at school, but that could be attributed to random variation. Notice that the null hypothesis always has the same explanation for these results: we did not prove anything, the differences (or correlations) were not significant, we can explain minor fluctuations or trends as due to pure chance. Whenever we fail to reject the null hypothesis as an explanation for our data, we admit that we have proved nothing.

In order to prove something, we must **start by rejecting the null hypothesis**. This is where inferential statistics come in. We must calculate (or estimate) the probability of the null hypothesis being able to explain the observed data. Probabilities are represented by decimal numbers that range from 0.00 (which stands for something completely impossible) to 1.00 (which stands for something completely certain). Notice that both correlation coefficients and null hypothesis probabilities use decimal numbers in the same range (except that probabilities can never be negative). In order to avoid confusion between the two, we use the **letter r for correlation coefficients** and the **letter p for the probability** of the null hypothesis. Here is how to remember the difference.

C O R R E L A T I O N

repeats the letter r, and does not have the letter p

N U L L H Y P O T H E S I S

uses the letter p, and does not have the letter r

For example, suppose I claimed to have a magical ability (e.g., psychokinesis) such that if you flipped a coin, I could use my mind power to make it come up heads. If you are thinking like a scientist, you would start off being skeptical of my claim, and demand an empirical demonstration. So, you flip a coin, and I say the magic word, and lo and behold, the coin comes up heads. I say "See, I told you so." But then you say, "That was just pure luck because you had a fifty-fifty chance of getting it right." What you have just done is accepted the null hypothesis. You looked at the fact that $p = .50$ and concluded that my data were not statistically significant. So, we flip the coin again, and again it comes up heads, but still you are not convinced, because $p = .25$, so you keep accepting the null hypothesis, claiming that I am just lucky. Even after three flips and heads, most students would still say "still probably just luck" because $p = .125$ at this point. However, there would come a point at which you would say "No one is that lucky, there is something else going on here." At that point you have rejected the null hypothesis as an explanation because its probability was too low. Then some other explanation (e.g., fraud, psychokinetic ability) must be considered.

We need to come to some agreement as to where to draw the line, when to reject the null hypothesis as an explanation for our data. Most editors of psychology journals have regarded that if the probability of the null is less than .05 ($p < .05$) then we reject the null with some confidence that we have really proved something. The smaller the probability, the more confident we can be about [the significance of our findings](#).

STATISTICAL SIGNIFICANCE

$p = 1.00$	----- (certainty)		
	$p > .10$	not significant	ACCEPT THE NULL
$p = .10$	-----		
	$p < .10$	marginal	ACCEPT THE NULL
$p = .05$	-----		
	$p < .05$	fair	REJECT NULL
$p = .01$	-----		
	$p < .01$	good	REJECT NULL
$p = .001$	-----		
	$p < .001$	excellent	REJECT NULL
$p = 0.00$	----- (impossibility)		

When we speak about statistical significance we should use terms such as *excellent, good, fair, marginal, and not significant*. It is confusing to use terms such as *strong and weak, or low and high* when discussing p values, so reserve those terms for describing correlation coefficients.

GRAMMAR LESSON: Do not use the word *significant* unless you mean $p < .05$.

In practice, statistical significance is influenced by several factors. The first is sample size. In general, the larger the sample is, the more significant the data are. If the sample size is small (say, under twenty) it is pretty hard to reject the null. Professional polling organizations, such as Gallup, usually go with a sample size of about a thousand, because that means that a difference of just a few percentage points in the polls will be statistically significant ($p < .05$). Another factor influencing significance is the magnitude of the difference between the groups (or the strength of the correlation coefficient). The stronger the correlation (or difference between two groups), the more likely it is to be a significant one. It takes a large sample for a small difference to be significant, and it takes a large difference for a small sample to yield significant data. Yet another factor is how much dispersion there is on the dependent variable. High standard deviations may make it harder to achieve statistical significance.

<i>significance</i>	Better	Worse
Difference between groups	Bigger	Smaller
Difference within groups	Smaller	Bigger
Sample size	Bigger	Smaller

QUESTION #3.7: *How can psychologists infer a cause and effect relationship between two variables?*

We know that introspection cannot enable us to make a causal inference, for it merely records of series of thoughts, emotions, and other experiences, and can prove no causal relation between them.

We know that case studies cannot enable us to make a causal inference, for case studies merely record bits of information about one subject, and cannot prove a causal relation between them. A single case study cannot be used to prove a diagnostic technique as valid or reliable. Case studies cannot prove what was the cause of the patient's mental disorder or whether the prescribed treatment was effective.

In order to confirm a causal hypothesis about two variables, we must accomplish three things.

- First, we must reject the null, and thereby declare statistical significance.
- Second, we must be able to establish one of the variables in the role of a likely cause.
- Third, we must make sure that the direction of the correlation is consistent with that of the causal hypothesis.

Here are three examples of research that fail to confirm the original causal hypothesis.

Example #1: Do students perform worse on exam if the room is hot and stuffy? It was hypothesized that students who took an exam in a room with a Fahrenheit temperature of 78 degrees would do worse than students who took the exam in a room with a temperature of 68 degrees.

<i>Data which are not significant: No causal relationship can be established</i>			
		VARIABLE TWO	
		Mean score on the exam	n
V A R I A B L E O N E	Warm room	72	20
	Cool room	74	24

The first group did score lower (mean of 72 vs. 74, $p > .10$). Since these data were not significant, we cannot reject the null hypothesis. We did not verify any causation between performance and temperature. Perhaps if the sample had been larger, the difference might have been significant, but so far, all we can say is that we have proved nothing.

Example #2: Does watching violent videos cause children to become violent? It was hypothesized that watching violent videos would make children more violent. The subjects were eight-year-old boys ($n = 46$). The children could choose to watch any of a selection of videos that had been classified by the researchers as violent or non-violent. The number of children engaging in physical aggression was then measured.

<i>Correlation between dependent variables: No causal relationship can be established</i>				
		VARIABLE TWO: aggressive?		
		Yes	No	totals
V A R I A B L E	Chose a Violent Video	15	11	26
	Chose a NON-violent video	1	19	20
Totals		16	30	N = 46

The results indicate a moderate relationship between the variables ($r = +.55$) the children who watched the videos were more likely to engage in physical violence themselves. These data cannot be explained by random variation ($p < .001$), the null hypothesis can be rejected with an excellent level of confidence. However, it is on the second step that our causal reasoning breaks down. This research was only a survey (not an experiment in which the video watched was manipulated), and whether or not the child saw the violent video was the choice of the subject (and was therefore a dependent variable). So, we cannot conclude that watching the video (variable X) **caused** the child's later violent behavior (variable Y). Even though we have rejected the null, there remain three plausible causal relationships between these variables.

One, the video did cause the boys to be violent.

(X caused Y.)

Two, the boys who were more violent to begin with tended to prefer the more violent videos.

(Y caused X.)

Three, both the boys' violent behavior and their video viewing preferences should be regarded as dependent variables which are the result of some other background factors, such as irresponsible parents or violent genes.

(some other variable Z caused both X and Y.)

This last explanation is sometimes called a **spurious** relationship between two collateral effects in which neither observed variable was the cause of the other. Note: a spurious correlation may be strong and statistically significant, it just does not show that one variable caused the other. To make such a causal inference is to commit the **post hoc fallacy**.

If this research had been an experiment, instead of a mere survey, we could have confirmed the originally hypothesized causal relationship. In such an experiment, we would have had to treat the viewing of the video as an independent variable to be manipulated, not a dependent variable left up to the choice of the individual subjects. The boys would have been randomly assigned to one of two groups, being forced to watch (or prevented from watching) the violent videos. The process of random assignment would have also served to balance out such background factors as parental influences, such that children from good homes and bad homes had the same probability of ending up in each group.

Example #3: Does video training improve worker performance? It was hypothesized that newly hired workers (n = 25) would perform better on their jobs if they received video based training. In this experiment, ten workers were randomly assigned to receive video based training, while the other fifteen served as controls (receiving the standard training which takes place in person). After two weeks on the job, the performance of these two groups was compared.

The results indicate a moderate relationship between the variables ($r = -.50$). These data cannot be explained by random variation ($p = .036$), so the null hypothesis can be rejected with a fair level of confidence. We have cleared step one.

<i>Correlation in unanticipated direction: Proves the opposite of initial prediction</i>				
		VARIABLE TWO: performance		totals
		Satisfactory	Unsatisfactory	
V A R I A B L E	Video Based Training	3 30%	7	10
	Training Without The Video	12 75%	3	15
Totals		15	10	N = 25

Since this was an experiment, we know that the video training was a variable independent of the individual subject's choice, therefore, it has the role of cause. So, we have cleared the second step.

However, the correlation is not in the expected direction. The original hypothesis said that the workers who received the video training should do better on their performance evaluations. The correlation we expected to get between the variables was direct, but the little sign in front of the correlation coefficient is negative. That reverses the relationship between the variables: the workers who got the video training tended to do worse. Less than a third of the video trained workers performed satisfactorily, compared to three-quarters of the control group. So, we did not prove that the videos helped training; we proved that the videos hurt training.

GRAMMAR LESSON: Terms such as *helped, hurt, improved, and impaired* imply a causal relationship. Don't use them unless you want to imply causation.

Here is an example of research that clears all three steps on the road to causal inference. It was hypothesized that customers (n = 500) would be more likely to register their product warranties when promised a ten-dollar gift certificate as a reward. In this experiment, a hundred of the products were randomly packed with the offer of the gift certificates and the rest were not. Within two weeks after purchase, the following registration rates were noted: 50% with the gift certificate versus only 10% without.

Data which demonstrate causation: Statistical Significance, Expected Direction of Correlation, Identifiable Independent Variable				
		VARIABLE TWO: warranty registered?		
		Yes	No	totals
V A R I A B L E	Gift Offer	50 50%	50	100
	No Gift Offer	40 10%	360	400
Totals		90	410	N = 500

These data cannot be explained by random variation ($p < .001$), the null hypothesis can be rejected with an excellent level of significance, so we have cleared step one.

Since this was an experiment, we know that the gift offer was a variable independent of the individual subject's choice, therefore, it could have the role of cause. So, we have cleared the second step.

These data indicate a moderate relationship between the variables ($r = +.4$): half of the subjects receiving the gifts registered, but this was true for only ten percent of the other purchasers. Since the correlation was in the expected direction (we predicted that the customers who got the gift offers would be more likely to turn in their cards), we have cleared the third step.

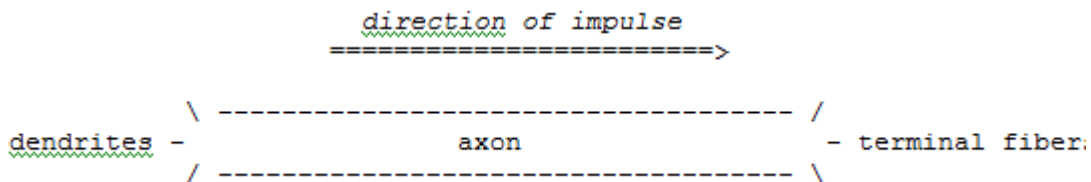
UNIT 4: THE NERVOUS SYSTEM

QUESTION #4.1: What is the basic unit of the nervous system?

The **neuron is a single nerve cell**, and you have billions of them. There are three basic types of neurons: association, afferent, and efferent. The association neurons comprise the central nervous system (**CNS**) that is the brain and spinal cord. The **afferent neurons** are also known as the **sensory** neurons: they bring the stimuli from the sensors (e.g., skin, eyes, ears) to the CNS. The **efferent neurons** are also known as **motor** neurons: they bring the responses from the brain to the muscles and the glands. An analogy for afferent and efferent neurons is that they are like one-way streets: on a given neuron the traffic can only travel in one direction: to or from the CNS depending upon the type of neuron.

Here is how to remember the difference between afferent and efferent neurons. The letter **A** comes before the letter **E** in the alphabet. The stimulus must come before the response. The afferent neuron must bring the stimulus to the CNS before the efferent neuron can send the response from the CNS.

Most neurons are long, thin cells. One neuron stretches from the tip of your big toe to the base of your spine. At the beginning of the cell are the **dendrites** that pick up the stimulus from the sensor (or impulse from another neuron). At the other end are the terminal fibers, which end at another neuron (or at a muscle or gland). Between the two ends is the long middle, the **axon**. Here is a diagram not to scale. If it were more to scale it would look like a piece of dental floss, with the two frayed ends representing the dendrites and terminal fibers, respectively.



Surrounding the axon is a sheath of **myelin**, a **white, fatty substance that insulates** the neuron much as the black plastic coating insulates an electrical wire. Myelin increases the speed at which a neural impulse passes through a neuron.

About a century ago, Santiago **Ramon y Cajal** determined that individual memories are not stored in individual neurons, but in networks of neurons.

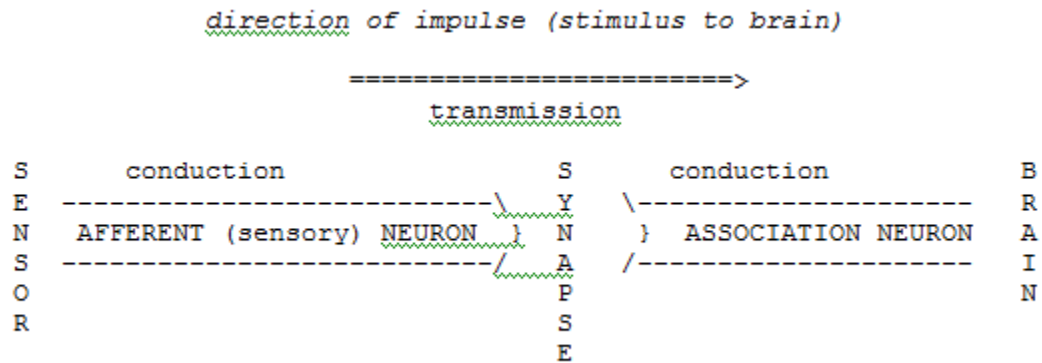
QUESTION #4.2: How are neural impulses conducted and transmitted?

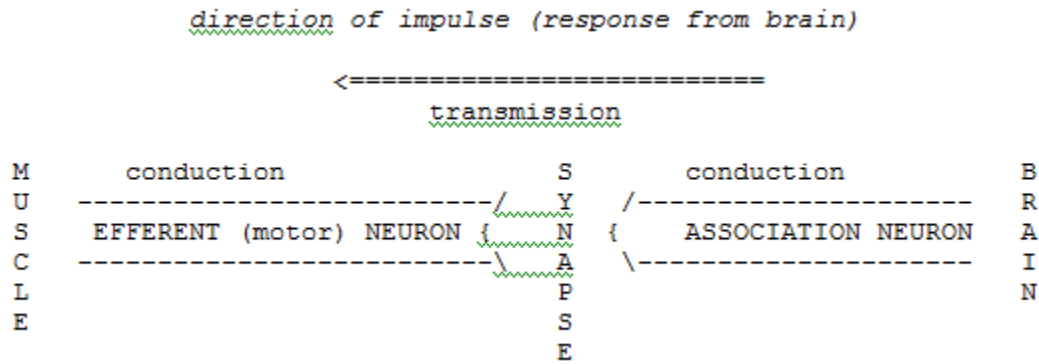
Conduction is when a neural impulse goes from one end of the neuron to the other. Neural impulses involve an electro-chemical spike that is conducted along the axon from the dendrites to the terminal fibers. This has a speed of several hundred meters per second, and even somewhat faster in a thick, fully myelinated neuron.

Neural impulses have a fairly constant voltage, a difference of electrical potential of about a tenth of a volt. Each time a neuron conducts an impulse, this is an **all-or-nothing** event: the neuron either conducts the impulse or it does not. When a stimulus is below the threshold for triggering an impulse, no impulse is sent.

So, the brain has no way of knowing about the intensity of the stimulus based upon the voltage of the incoming impulse. Whether it was a major pain or a minor tickle, the voltage of the neural impulse will be the same, due to the all-or-nothing nature of conduction. The only way that the brain can distinguish the intensity of stimuli is to look at the frequency with which the impulses arrive: the more intense the stimulus, the greater the number of impulses sent. A very painful stimulus might result in eight hundred impulses per second being conducted.

Transmission is the process of getting the impulse from one neuron to another. Unlike two electrical wires, the two neurons are not in direct contact, but there is a microscopic gap between them. The **synapse is the gap between the two neurons**. This gap lies between the terminal fibers of the sending neuron to the dendrites of the receiving neuron. The impulse must pass over this gap before it is to get to the next neuron. This is a relatively slow point in the process of getting the message to or from the brain.





Neurotransmitters are chemicals that work in the synapse to transmit the impulse from the sending neuron to the receiving neuron. The terminal fibers of the sending neuron have vesicles containing these chemicals. As the impulse arrives in the terminal fibers, the vesicles release the chemicals into the synapse. The chemicals then go across the microscopic synaptic gap and are received by tiny receptor sites in the dendrites of the receiving neuron. When a sufficient number of receptor sites have been filled, the receiving neuron then conducts the neuron impulse down its axon to its terminal fibers. Some neurotransmitters have the role of **agonists** which facilitate transmission while others have the role of **antagonists**, which make transmission more difficult.

Dopamine is one example of a major neurotransmitter. When levels of dopamine are low, the individual might have difficulty sending out responses to the limbs or tongue. In one neurological disease, Parkinsonism, dopamine levels are low, and patients stutter in their speech, and their hands may tremor. A medication for Parkinson's, Levodopa, temporarily increases the levels of dopamine, and the patient can speak, walk, and write in a more normal fashion. However, right after receiving a daily dosage, Parkinson patients might have such abnormally high levels of dopamine that their neurons start transmitting information from the senses even though there is no physical stimulus, resulting in hallucinations.

Case Study: Mr. G was a retired real estate developer in Silicon Valley. He was diagnosed with Parkinson's Disease in his early fifties. As it worsened, his dosage of Levodopa was increased. Although he lived in a well-constructed house (that he himself had built) on a large lot in a quiet neighborhood of an exclusive suburb, he began to complain about the racket that the neighbors were making. He thought that one neighbor was using power tools working on a boat, playing music loudly, and using foul language. His wife could hear none of this. The neurologist concluded that that these morning auditory hallucinations were a side effect of his Levodopa dosage, and recommended a divided dosage. Then the reports of hallucination subsided both in frequency and intensity.

<i>Importance of neurotransmitters</i>			
Neurotransmitter	Role	Affects	Disorders
Acetylcholine	Excitatory	Arousal, attention, memory, motivation, movement	Low in Alzheimer's
Dopamine	Inhibitory	Attention, learning, movement, pleasure	High in schizophrenia, low in Parkinson's
Serotonin	Inhibitory	Anxiety, dreaming, eating, sleep, mood, pain	Depression (Prozac, Paxil and Zoloft increase serotonin levels)
Noradrenaline Norepinephrine	Excitatory	Activity, alertness, eating, heart rate, learning, memory, mood, sleep	Depression (cocaine and amphetamines increase norepinephrine levels)
Gamma-amino-butyric acid	Inhibitory	Eating, sleep	Anorexia, bulimia
Endorphins Enkephalins	Inhibitory	Pain	
Substance P	Excitatory	Pain	

Schizophrenia is a serious, chronic mental disorder characterized by symptoms such as auditory hallucinations. Some of the older anti-psychotic medications (e.g., chlorpromazine) given to schizophrenics controlled symptoms such as hallucinations by reducing levels of dopamine. Unfortunately, prolonged use of these medications meant that some patients developed Parkinson-like symptoms.

Case Study: Ms. R is now in her sixties. She was initially hospitalized for schizophrenia in her mid twenties and has spent most of her life in mental institutions. She receives regular doses of anti-psychotic medications to reduce her hallucinations and disruptive behavior. Now her hands show an obvious tremor. Her eyes roll involuntarily. She tends to drool and her tongue frequently juts out, as if she were a frog trying to catch a fly. These extrapyramidal symptoms, such as **tardive dyskinesia**, are probably the side effects of long-term use of the medication, and its depletion of her dopamine levels.

Norepinephrine and serotonin are neurotransmitters that are generally in low levels in depressed patients. Medications like Prozac and other Selective Serotonin Reuptake Inhibitors **SSRIs** are usually effective in alleviating symptoms of depression in about four weeks.

Other important neurotransmitters are the catecholamines which can transmit arousal or inhibitory messages, and the endorphins which go into the opiate receptor sites and give the kind of natural high you get after a good physical workout.

Anything that affects the body's chemistry can impact the neurotransmitters and alter a person's mood, behavior, or mental performance. This would include legal drugs like caffeine (from tea and coffee), nicotine (from tobacco), and alcohol, as well as illegal drugs. Even fluctuating levels of **hormones** (the chemicals associated with sex) and the **endocrine** glands (e.g., pituitary, thyroid, adrenals) can cause such changes.

Case Study: Ms. H was a fourteen-year-old freshman at an exclusive girls' boarding school. She was from a relatively stable, intact family of financial means. During her first semester, she was a model student, earning a 3.5 GPA. After Christmas, her grades plummeted and she became a disciplinary problem in the dorm and during her frequent weekend visits home. Her parents suspected that she was getting in with the wrong crowd or using drugs. The school counselor suggested that she be given a thorough physical exam by her regular pediatrician during the upcoming spring break. The exam revealed that Ms. H was suffering from hyperthyroidism, making her moody, agitated, and unable to concentrate. When she was given the proper medication, she returned to her old self. She exhibited no more disciplinary problems. Her academic success resumed.

Case Study: Ms. K is now in her mid forties and in the midst of menopause. Her hormonal levels are fluctuating rapidly. This is giving her physical symptoms, such as night sweats, and moodiness similar to an agitated depression. She gets angry or weepy for no apparent reason. When she was started on hormone replacement therapy to guard against loss of bone mass (osteoporosis) an added benefit was that her mood stabilized.

QUESTION #4.3: What is the role of the autonomic nervous system?

The **autonomic nervous system (ANS)** is part of the peripheral nervous system that either gets the body ready for action, or slows it down to conserve resources. The ANS governs such organs as the heart (speeding up or slowing down circulation) lungs (speeding up or slowing down respiration), and the release of glucose.

The **sympathetic nervous system** activates the body's resources for the **fight or flight** response. When you suddenly see some danger, or are getting ready for a major athletic contest, you can feel the adrenaline kick in. Your respiration and heart rate increase. Your blood clots

more readily. Nutrients are being released and sent to the major voluntary muscles so that you can run or engage in physical combat.

The **parasympathetic nervous system calms down the body** by inhibiting the aforementioned activities. This serves to conserve the body's scarce resources during times of injury or exhaustion. Here is how to remember the difference between the two: when you are injured, you need to call the PARAmedics. Think of the PARAsympathetic nervous system as the body's own paramedic.

Autonomic nervous system		
	Sympathetic	Parasympathetic
<i>Pupils</i>	Dilate	Constrict
<i>Glands stimulated</i>	Sweat	Salivary, Tear
<i>Heartbeat</i>	Accelerates	Slows
<i>Bronchial tubes</i>	Dilate	Constrict
<i>Digestion</i>	Inhibited	Stimulated
<i>Urine</i>	Volume decreases	Bladder contraction
<i>Liver glucose release</i>	Stimulates	Inhibits
<i>Digestion</i>	Inhibits	Stimulates

Biofeedback is a way of monitoring the response of the ANS. Normally, the muscles and glands of the ANS are involuntary: we cannot consciously trigger the sympathetic or parasympathetic responses. However, with the technology of biofeedback, individuals can gradually learn to control these activities, achieving a greater degree of activation or relaxation. This can be of practical application in controlling such psychophysiologic disorders as asthmatic bronchial constriction or migraine headaches.

Diagram of the complete nervous system		
Central nervous system	Brain	Hindbrain
		Midbrain
		Forebrain
	Spinal cord	Ascending
		Inter-neurons
		Descending
Peripheral nervous system	Somatic division (voluntary muscles)	Sensory nerves
		Motor nerves
	Autonomic nervous system (involuntary)	Sympathetic
		Para-sympathetic

QUESTION #4.4: How can scientists study the brain?

Lesions are points of damage to neural tissue. In research on brain injuries, the site and scope of the damage would be the independent variable, and the resulting changes in behavior and emotion would be

the dependent variable. Damage to the **CNS (central nervous system)** is serious because neural tissue (compared to say, skin cells) is less likely to regenerate. That is why cases of brain damage and spinal cord injury may involve permanent losses. **Neuroplasticity** is the ability of the brain to adjust to injury, the environment and even its own behavior. Infants have a greater degree of plasticity than do geriatric patients. One of the hopes of stem cell research is that new approaches can be found to increase plasticity. When speech therapy or physical therapy helps brain injured patients to recover a lost function, it is usually because these patients have been taught to use other parts of their brains to take over for the lost function.

Case Study: In 1848, a railroad worker named Phineas Gage survived a horrible accident. While setting an explosive charge, it went off prematurely, sending a heavy tamping iron through his cheek and up through the front part of his brain. The most amazing thing is that Gage survived. Prior to the accident he was mild mannered and hard working. After the accident, for the rest of his life, he was cantankerous and belligerent, given to using profanity and alcohol. After he died, the physicians who examined his brain injury inferred that those parts of his injured brain (the frontal lobe) must have a major impact on human emotion.

While the location of brain injuries is an important factor in behavioral disturbances, there is no scientific credibility to the theories of **phrenology**, a pseudoscience which claimed that a person's character could be inferred by examining the bumps on his head.

A comprehensive study of brain injuries was done by German neurologist Kurt **Goldstein**. In the wake of the First World War, he examined thousands of patients with brain injuries. While he agreed that there was a moderate correlation between where the injury occurred and the resulting behavioral changes, Goldstein noted a great degree of individual variation in terms of how well the patients succeeded in their rehabilitation. The nature of the brain injury was only one influence. Other important factors (independent variables) in successful outcome (the dependent variable) were the patient's age, social support, and pre-morbid personality.

ESB (electronic stimulation of the brain) is used in animal research. An electrode is implanted to a certain part of the brain, and this serves to directly stimulate that region (and constitutes the independent variable). The resulting changes in mood or behavior would constitute the dependent variable.

EEG (electroencephalography) is a technique for studying the electrical activity of the brain, the "brain waves." This technique involves placing electrodes on the scalp. It has been around since the 1930s. Electroencephalography can look at the entire brain, or evoked potentials for specific regions or neurons. It can identify a person's level of sleep or indicate if the person is undergoing a convulsion, such as epilepsy.

Brain scanning techniques involve computerized technology that has only been around for just over thirty years. **CAT** or CT (computerized axial tomography) assembles a three dimensional picture of the brain from thousands of separate x-rays. This is useful in detecting abnormalities of mass, such as tumors. It can also detect the later stages of some chronic brain syndromes, such as Alzheimer's Disease. Nuclear resonance magnetic imaging (**NMRI**) uses a powerful magnetic field to generate an even more detailed picture of the brain. **PET** (positron emission tomography) scans look at the metabolic function of different organs, including specific regions of the brain. Newer techniques of single photon emission tomography (SPECT) and brain electrical activity mapping (BEAM) offer hope for greater precision, validity, and reliability in looking at specific brain functions.

<i>Electronic techniques for studying the brain</i>		
Acronym	Complete term	What it measures
ESB	Electronic stimulation of the brain	How brain responds to electrical stimulation of specific parts
EEG	Electro encephalography	Electrical wave activity
CT, CAT	Computerized axial tomography	Scans with x-rays, creates three dimensional image
PET	Positron emission tomography	Scans for metabolism
NMRI	Nuclear magnetic resonance imaging	Scans using magnetic fields instead of x-rays

QUESTION #4.5: What is the limbic system?

The **limbic system is a part of the brain that deals with emotions, drives, and the internal organs.** The limbic system includes the amygdala, hypothalamus and hippocampus. The amygdala is the center for sexual arousal, the aggressive drive, and fear. Experiments with lesions in animal brains indicate that damage to the amygdala can reduce aggressiveness. On the other hand, ESB experiments in animals indicate that stimulating the amygdala can produce aggressive or sexual behavior even when sufficient environmental cues might be lacking. After ESB stimulated his amygdala, one tomcat tried to mount females who were not in heat.

The **hippocampus is primarily concerned with memory,** specifically with encoding memories for long-term use. We will discuss it more thoroughly in unit 7, on memory.

The **hypothalamus** also deals with emotions, as well as the drives for **hunger and thirst.** There is one part of the hypothalamus that initiates eating or drinking behavior by telling the organism that it is hungry or thirsty. There is a different part of the hypothalamus that tells the organism that it has had enough, and can stop eating or drinking. Lesions on the first part, the initiation center, can greatly reduce eating or drinking behavior. Lesions on the second part, the satiety

center, can cause the organism to keep on eating or drinking to the point where the stomach can simply take no more.

QUESTION #4.6: What is the role of the cerebrum?

The cerebrum is the top most part of the brain. The **cerebrum deals with thinking**, voluntary muscles, and perception of stimuli. The cerebrum is the largest part of the human brain, but this is not the case with lower species. Invertebrate, fish, amphibian, and reptile brains have small cerebra. Birds, such as the parrot, have a larger cerebrum, and most mammals have one even larger. Whales and elephants have very large cerebra, but in proportion to their total body size, it is not nearly as large as the human cerebrum. Only dolphins are in the same league with humans: about two percent of body weight in the cerebrum.

Each part of the cerebrum, whether it deals with incoming sensory stimuli or outgoing motor responses, is highly specialized. The area of the brain devoted to a specific function is related to the complexity of the function. So, more of the cerebrum is devoted to the control of the tongue or thumb than to the leg because the tongue and thumb are much more complex in their activity. Specialized areas such as **Wernicke's** and **Broca's** are associated with language skills. Lesions to those areas can greatly reduce a patient's ability to understand or produce speech, respectively.

The **cerebral cortex is the outermost layer** of the cerebrum. Its primary function is to **process new information**. Cortical atrophy can lead to disorientation in place or time.

The lobes are the four main areas of the cerebrum, as they are divided by various fissures. Each lobe tends to specialize. The frontal lobe is just behind the forehead. The **frontal lobe** deals with the control of **emotion**. Just below the frontal lobe is the **thalamus, which acts as a relay station** of neural impulses from the limbic system to the frontal lobe. Damage to this area (as seen in the case of Phineas Gage) may make the individual less able to control emotional expression. On the other hand, other types of damage in this area may serve to blunt the individual's overall level of emotionality. Indeed, one particular psychiatric treatment developed in the 1930s was a brain surgery known as pre-frontal **lobotomy**, which severed the connective tissues between the thalamus and the frontal lobe with the expressed purpose of reducing the patient's emotions of fear, anger or sadness.

The temporal lobe is just in from the ears, on either side of the head. The **temporal lobe** processes the sense of **hearing**. Lesions on the temporal lobe can create hearing loss, even when there is nothing wrong with the ear or auditory nerve.

T E M P O r a l tempo of the music you hear

The occipital lobe is in the back of the head. The **occipital lobe** processes the sense of **vision**. Lesions on the occipital lobe can result in blindness, even when there is nothing wrong with the eyes or optic nerve.

O C C I P I T A L two I's (eyes) help you CC (see, see)

The **parietal lobe** is at the top of the head, just about where many fifty-year-old men get a bald spot. The parietal lobe processes the **other senses**, such as those coming from the skin.

Do not confuse the cerebrum with the cerebellum. The cerebellum is located just below the occipital lobe. It is much smaller than the cerebrum, about the size of your fist. The **cerebellum is concerned with posture, balance and coordinated locomotion**. The cerebellum will be highly developed in species that must run, jump or fly fast.

Parts of the brain		
Part	Location	Function
Medulla	Hindbrain	Controls autonomic system activity, breathing
Pons	Hindbrain	Bridge connecting other parts of brain
Cerebellum	Hindbrain	Coordinates muscular movements
Reticular formation	Midbrain	Controls level of arousal, alertness
Corpus callosum	Forebrain	Connects hemispheres
Cerebral cortex	Forebrain Cerebrum	Processes new information from the senses, motor response
Frontal lobe	Forebrain Cerebrum	Emotions
Occipital lobe	Forebrain Cerebrum	Vision
Temporal lobe	Forebrain Cerebrum	Hearing
Parietal lobe	Forebrain Cerebrum	Other senses
Left hemisphere	Forebrain Cerebrum	Logic, math, language
Right hemisphere	Forebrain Cerebrum	Spatial relations
Broca's area	Forebrain	Language
Wernicke's area	Forebrain	Language
Limbic system	Forebrain	Emotions
Hippocampus	Forebrain	Memory
Thalamus	Forebrain	Connects limbic system and frontal lobe of cortex
Hypothalamus	Forebrain	Emotions, hunger, thirst
Septal area	Forebrain	Processes cognition into emotion
Cingulus	Forebrain	Processes cognition into emotion

QUESTION #4.7: What is the role of the left and right hemispheres?

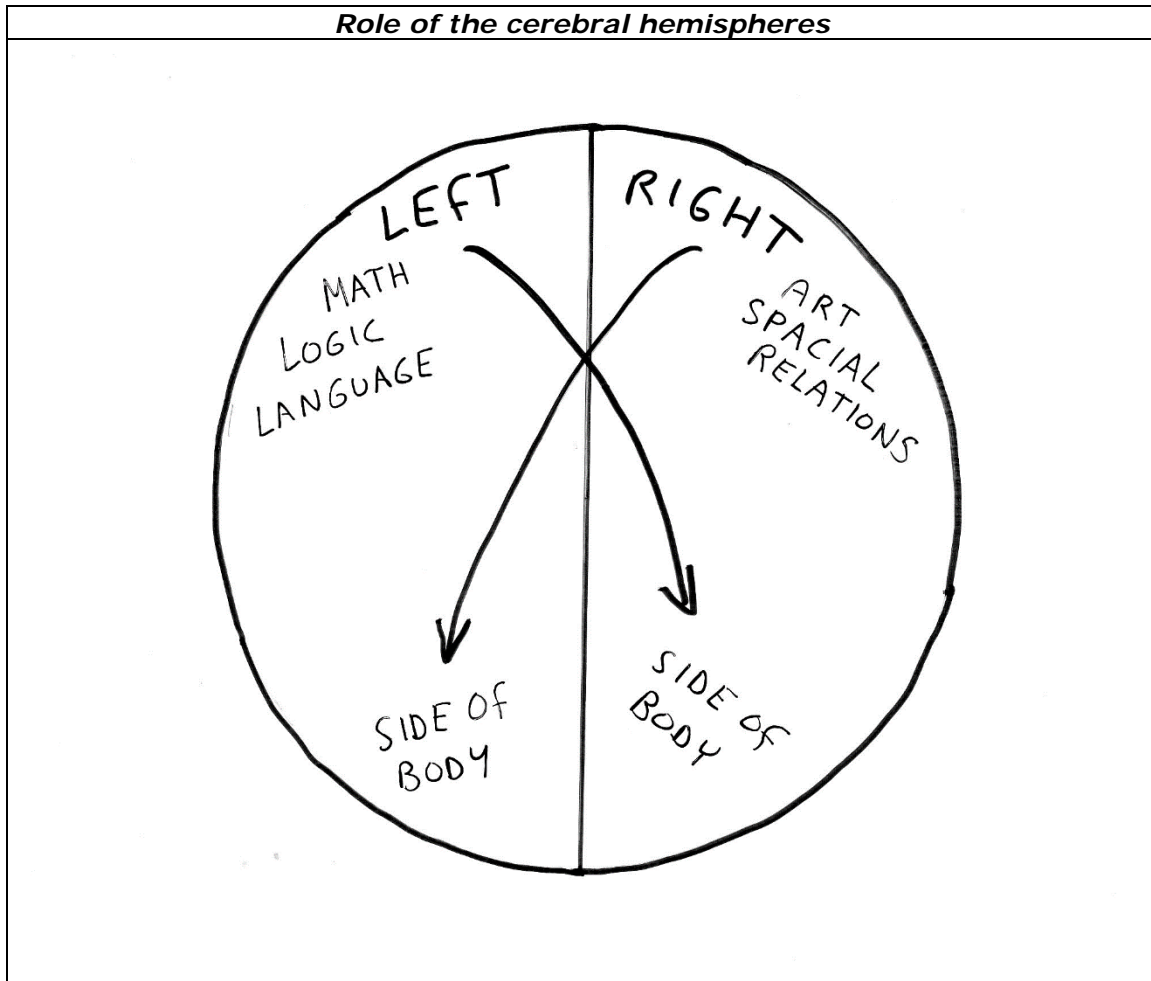
It has been more than a half century since Roger **Sperry**'s split brain research demonstrated the different functions and independence of the hemispheres. Although the brain appears to be symmetrical, the left and right halves (hemispheres) are somewhat specialized. Each one controls the other side of the body, which is why an injury to the left side of the brain (or a stroke) can result in paralysis on the right side of the body. **The right hemisphere is more concerned with spatial relations.**

Case study: Mr. T was a 61-year-old man who suffered a stroke in the right hemisphere, occipital lobe. When he awoke in the hospital, and his wife entered the room to see him, he did not recognize her until she spoke. His ability to recognize faces had been lost.

The left hemisphere is more concerned with skills such as language, mathematical computation, logical and sequential thinking.

Case Study: When Mr. J was a young boy in Mexico, he was shot in the head. The small caliber bullet entered his left hemisphere at about the hairline, and exited just above the occipital lobe. He almost died from the wound, and for a year he could not walk or talk. Gradually, he regained both of these abilities, but only as other parts of the brain could learn to take over the lost functions. Before the accident, he was right handed, but since then his right arm and leg have been weaker than his left. Before the accident, he attended school and was a very good student in reading, writing, and arithmetic. After the accident, he was unable to read or write, use a digital watch, or perform the simplest calculations.

Research on cerebral hemisphere specialization	
Researcher	Gazzaniga
Subjects	Patients who had undergone surgery to diminish seizures: the corpus callosum was severed so that the left and right hemispheres were no longer connected
Independent Variable	Visual stimuli (objects) were presented either on the right or left sides
Dependent Variable	What the subject reported was seen
Results	When shown objects on the left side, the subject could identify the objects by pointing to them, but could not verbally name them
Conclusion	Objects on the left side were interpreted by the right hemisphere, which has less of a verbal ability



One measure of laterality is handedness, the preference to consistently use one hand for a particular task, such as writing or throwing a ball. Only about ten percent of the population is thoroughly left handed, while about four fifths are right handed in everything they do. The remaining small percent have what is sometimes known as cross-preferences, and may write with one hand, yet throw with the other. There are low to moderate correlations between left-handedness and artistic interest.

QUESTION #4.8: What are the main diseases of the brain?

Several psychiatric conditions are due entirely to major disturbances of brain function, even when the individuals have been entirely normal throughout their lives.

Delirium is a disturbance in the brain's metabolic function. The delirious patient is usually seen in hospital emergency and intensive care units, rather than the private practice of a clinical psychologist. The delirious patient is going in and out of a fitful sleep. He is probably hallucinating, and may be talking incoherently.

If he could be assessed for orientation, he would be found disoriented for place and time.

Delirium is due to an acute brain syndrome that has disturbed metabolism. This can be something as simple as exposure to industrial chemicals (e.g., lead, mercury), illegal drugs, or the interactions of prescription medications. Deficiencies of B vitamins or minerals such as potassium can lead to delirium, especially in the aged. Extreme fever or dehydration can produce delirium (e.g., travelers wandering in the desert, sailors on a raft, patients suffering from diarrhea).

The key to treating delirium is to remove the underlying cause: detoxification, rehydration, vitamin supplements, etc. The prognosis is that the patient will probably make a full recovery to his pre-morbid state of functioning, or die if the conditions that resulted in the delirium are not corrected. Indeed, many dying patients go through a delirious state on their final death trajectory as various organ systems shut down, disturbing the brain's metabolism.

DISORDER: delirium

OLDER TERMS: acute brain syndrome

CLASSIFICATION: organic (old term)

SYMPTOMS: confusion, disturbed sleep, hallucinations

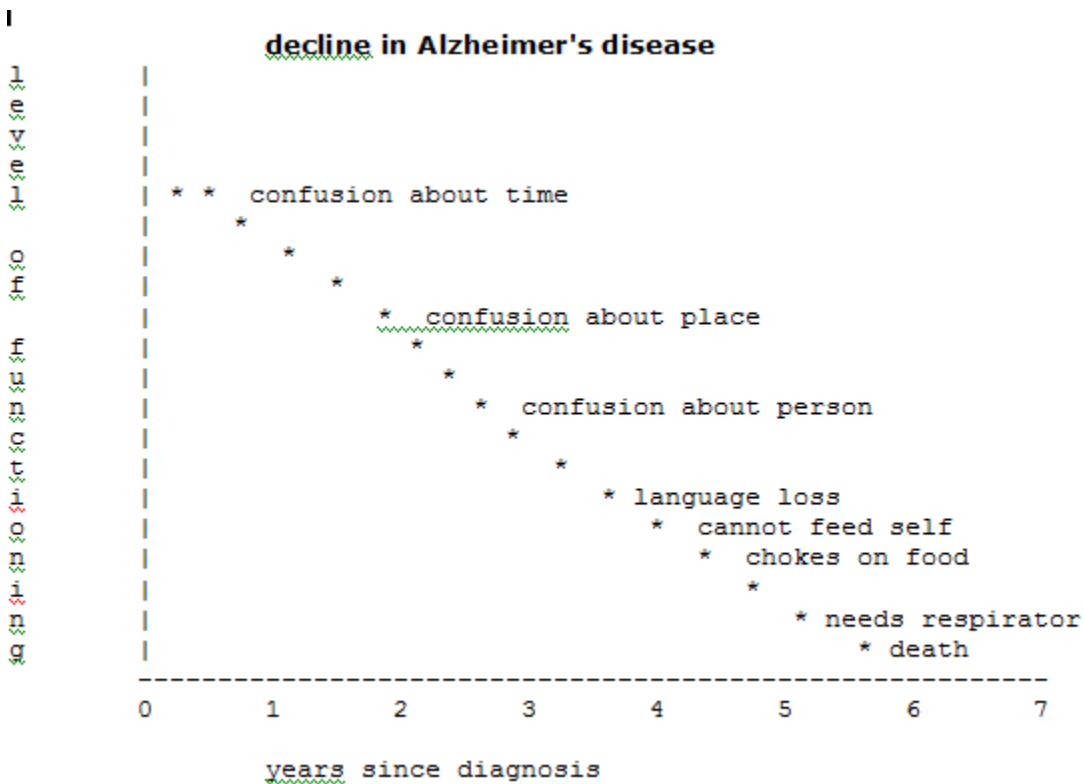
CAUSES: dehydration, exposure to toxic substances, medication, interactions and side effects

TREATMENT: correcting the underlying medical condition

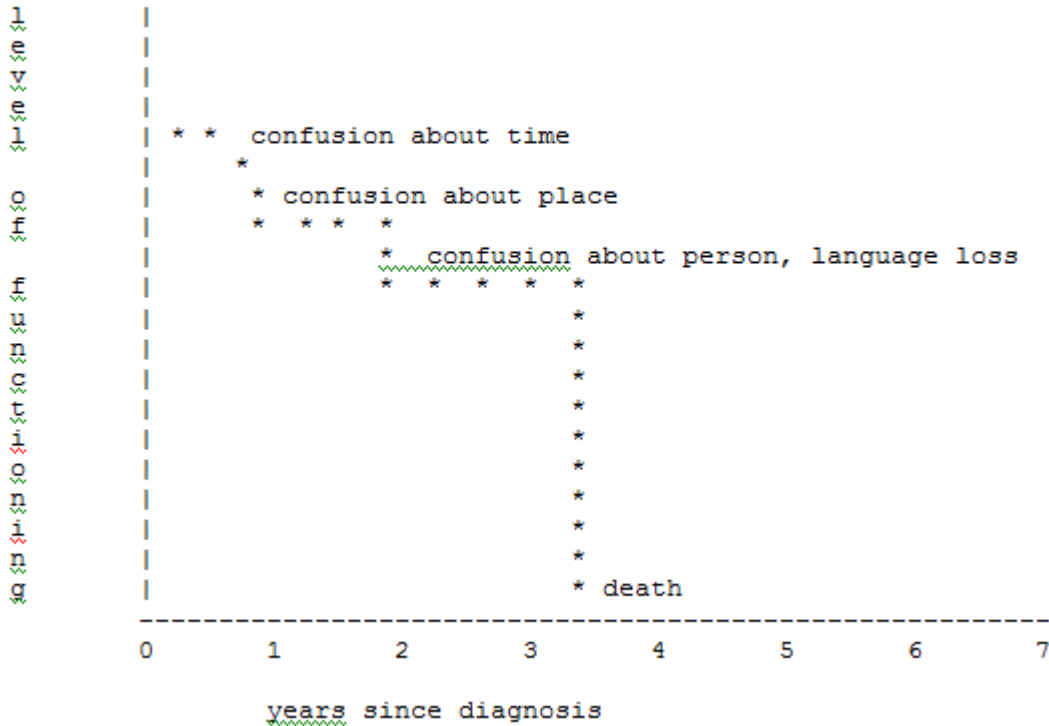
Dementia is a loss of mental capacity in adulthood (especially later life when it is known as senile dementia). While the vast majority of cases of dementia occur in later life, it is an ageist stereotype to think of old people as having reduced mental capacity. Only ten percent of people over age 65 have clinically relevant dementia, which is different in degree and quality from the benign forgetfulness associated with the normal processes of aging.

<i>symptoms</i>	NORMAL AGING	DEMENTIA
Vulnerable memories	Recent past	Recent past
Scope of forgetting	Details of event	Entire event
Remembers later	Sometimes	Rarely
Follows instructions	Usually	Increasingly difficult
Can use memory aids	Usually	Increasingly difficult
Belligerence	Rare	More frequent as disorder progresses

The initial symptom in most cases of dementia is a loss of short term memory. As the condition worsens, the patient may lose orientation in time, and not remember what day of the week it is. The ability to follow instructions diminishes. At this early stage, minor depression and paranoia may arise. At a more advanced stage, the patient may lose orientation for place, and get lost, even in familiar territory. At a later stage, the patient may not be able to recognize family members, or even put a sentence together. About this time, the parts of the brain that govern the bowels and bladder may go out, yielding incontinence. The patient may be unable to dress or feed himself. Later he may choke on food, or his own saliva. The part of the brain governing respiration may become impaired, and he may require a ventilator to keep breathing. Eventually, the parts of the brain governing the heartbeat will go out, and heart failure will ensue.



decline in vascular (or multi infarct) dementia



Case Study: Ms. T, at age 81 went to live with her grandson and his wife. The reason for the move was that Ms. T was getting too confused and frightened living alone, and was no longer capable of getting money out of the bank or paying her bills. Physically strong, Ms. T would spend most of the day working outside in the large yard, quickly filling up each of four garbage cans with clippings. Her grandson told her to leave one can empty for the garbage coming from the house. She could not remember this and still filled up all four cans. A reminder note was written on one of the cans, but she either did not understand it, or decided not to follow the instructions. One garbage can had to be chained closed so that she could not get into it. The same thing happened in the kitchen. She was told that she was not supposed to use the stove, but used it anyway, ignoring written notes. Finally, a baby fence was put up between the kitchen and the dining room. She kept on getting the mail from the mailbox, and then putting it down somewhere and could not remember where. A new mailbox with a lock was purchased to keep her out. Six years later, Ms. T started wandering off and getting lost outside, and getting violent during bath time. Then the grandson's wife decided that it was time to have Ms. T go to a nursing home.

Dementia can be caused by over fifty different chronic brain syndromes. Many of these are treatable, such as adult hydrocephalus ("water" on the brain) in which an operation can implant a ventricular shunt for reducing the pressure of cerebral spinal fluid on the cortex. If the

dementia is due to a cerebral vascular insufficiency, then carotid artery surgery might improve blood flow to the brain in some cases.

Unfortunately, the vast majority of the cases of late life dementia are due to chronic brain syndromes that are not reversible. At least half of all cases of late life dementia are due to **Alzheimer's disease**. We are not certain what the cause of this disease is, and we have no way to cure it. At best, some medications can slow its advance. Psychotherapy and memory training can help patients and their caregivers cope with the gradual advance of this debilitating disorder.

DISORDER: dementia

OLDER TERMS: chronic brain syndrome

CLASSIFICATION: organic (older term)

PREVALENCE: 10 - 20% of people over age 65

SYMPTOMS: loss of short term memory, emotional instability,
loss of social skills

AGE OF ONSET: more prevalent after age 65

CAUSES: Alzheimer's disease, vascular (multi-infarct), alcoholism, general paresis

TREATMENT: memory training, some medications may slow progression

One of the great challenges in geriatric psychiatry is the differential diagnosis between delirium and dementia, and between different forms of dementia, and even between dementia and other mental disorders (e.g., depression) than can reduce the patient's level of functioning.

	DELIRIUM	DEMENTIA
<i>Organic brain syndrome</i>	Acute	Chronic
<i>Most common cause</i>	Medication interaction	Alzheimer's
<i>Other common causes</i>	Dehydration, fever, poison, vitamin deficiency	Stroke, vascular
<i>Type of disturbance</i>	Metabolic	Usually lesions
<i>Onset</i>	Rapid	Gradual
<i>Memory Impairment</i>	Yes	Yes
<i>Disorientation</i>	Yes	Yes
<i>Prognosis</i>	Recovery or death	Slow decline
<i>Sleep disturbance</i>	Usually	Occasionally

UNIT 5: PERCEPTION

QUESTION #5.1: What is psychophysics?

Psychophysics is the scientific study of sensation and perception. This is one of the oldest branches of laboratory based scientific psychology. Back in the 1830s physicist Gustav **Fechner** (say "FEK ner") studied the relationship between the intensity of a physical stimulus and the ability of a person to detect it. He was able to formulate some key mathematical equations which are still used today. Below a certain level, the stimulus will not even be perceived. The **threshold** is defined as that minimum level at which the stimulus will be detected at least half of the time.

A few decades later, Ernst **Weber** (say "VAY ber") used experiments to determine that a person's ability to distinguish between two stimuli is determined, not by the absolute difference in intensities, but by the relative, **proportionate difference** in intensities. Weber's constant is the number he came up with for a given sensory modality that tells us how much of a proportionate difference between two stimuli will be a "just noticeable difference." **Adaptation** refers to the fact that with prolonged exposure, the stimulus has less and less effect (the organism gets used to it). Organisms are better at perceiving changes in the level of stimulation, especially those that are greater than the just noticeable difference.

Case Study: Ms. S weighs 120 and her younger sister weighs 180. They agree to go on a diet and each loses about a dozen pounds. Ms. S's husband has noticed his wife's weight loss just by looking at her fully clothed, but not that of his sister-in-law. The reason is that Ms. S's weight loss of ten percent was proportionately sufficient to attain that just noticeable difference. However, her sister's equal weight loss is distributed over a greater starting weight, resulting in a lower proportion of weight lost, and a difference that is not yet noticeable.

QUESTION #5.2: What are the major senses?

The body's senses are transducers: they change one form of energy into another. The sensors transduce the physical energy of environmental stimuli into the electrical impulses that travel on the afferent neurons to the CNS, where they go to different, specialized lobes of the cerebrum.

The **cutaneous** senses (located on the skin) include separate sensors for the detection of **heat, cold, pain, and pressure** (also known as the punctiform, tactile, or "touch" sense). Sensitivity (ability to detect a slight stimulus) varies according to both the individual and the site of the body involved. For example, you might be able to dangle your feet in a cold mountain stream (because there are few cold sensors in your feet), but when you try to wade in above the waist, the cold might be unbearable (because there are many cold sensors in the chest and back). It is easier to read brail with the tips of your fingers than the soles of your feet because the tips of the fingers have more pressure sensors than do the feet.

Proprioception involves the sensing of the motion of the body or its parts.

Proprioceptive senses include kinesthesia and equilibrium. **Kinesthetic sensors are in the muscles**, and detect the position of a limb and/or the load on a muscle. This sense must be highly developed in athletes and dancers.

SENSE	LOCATION	LOBE	DIMENSIONS
Heat	Skin	Parietal	
Cold	Skin	Parietal	
Pressure	Skin	Parietal	
Pain	All over	Parietal	
Kinesthesia	Muscles	Parietal	
Equilibrium	Inner ear	Parietal	
Gustation	Tongue	Parietal	
Olfaction	Nose	Parietal	
Audition	Ear	Temporal	Loudness, Pitch, Timber
Vision	Eyes	Occipital	Brightness, Hue, Saturation

Weber calculated the "just noticeable difference" constant for lifted weights to be about two percent. Try this: go to the gym and bench press, say about twenty pounds lighter than your maximum lift. Say you can bench press 120 pounds, so work with some reps of 100. Now, have a friend put an extra pound or so of weight on when you are not looking. You probably cannot notice the difference, because it is only one percent of the total weight you are lifting, less than what Weber's constant says you need for a just noticeable difference. Now take two sealed envelopes down to the post office: same type of envelope, same thickness, but the contents are different so that one envelope is just under one ounce (and can go for one first class stamp) while the other is nearly two ounces (and will require additional postage). Heft the two envelopes, and despite the similarity of appearance, your kinesthetic sense will be able to detect a noticeable difference between the two. This is because one is twice as heavy as the other. So, because of Weber's constant, and the importance of proportionate differences, you can detect a one-ounce difference in one situation, but you cannot detect a one-pound difference in the other.

Equilibrium is another proprioceptive sense. **Equilibrium detects the position of the body or a rapid change in velocity.** Equilibrium is sometimes called the **vestibular** sense because it is based on three semi-circular canals located in the area of the inner ear. Damage to the inner ear (through injury or high fever) might impair a person's sense of balance. The proper interpretation of this sense can be hampered by the weightlessness experienced by astronauts in space, or by the frequent unpredictable motions experienced in car, sea or air sickness. Indeed, this sense was developed for a species with a top natural speed of about twenty-five miles per hour. When you are in an automobile, or jet aircraft, your sense of equilibrium might misinterpret a rapid acceleration as climbing (or a rapid deceleration as falling). This is one reason why pilots in training must learn to trust their instruments, and not their senses.

The interaction of different sensory modalities can be seen with equilibrium. When visual cues about motion match the vestibular cues, the individual is less likely to misinterpret them or develop motion sickness.

Case Study: As a child, J tended to get car sick each Saturday when his family drove up the windy roads to the mountain cabin in Big Bear. Then he had a driver training course in high school. He obtained his learner's permit and drove with his father around the school parking lot, and later around town. J did so well that he convinced his father to let him drive up to the cabin on the weekend. His father agreed, but said that if J started to get car sick, he could return to his usual place in the back seat. J never got car sick when he drove because the driver must look in front, where the car is going, while a person in the back seat looks out the side window, where the visual report of motion does not match what the vestibular sense reports. The driver sees the upcoming curves, and must anticipate them, and is much less likely to be confused by the vestibular sense.

Chemoceptive senses detect the body's contact with chemicals. Chemoception includes smell and taste. **Olfaction** is the formal name for the sense of **smell**. Olfaction is located at the top of the nasal passage, where thousands of little epithelium cells detect molecules of inhaled substances. Humans can detect well over a thousand odors, but only a small percent of human sensory neurons are devoted to olfaction. Compare this to the dog, which has about a third of afferent neurons devoted to this sense. Dogs cannot only detect more smells, with fainter traces, but canines have a complex, multidimensional capacity for analyzing odors.

Because sensors detect change rather than absolute levels, we tend to become accustomed to surrounding smells. Our cologne is intensely noticeable when we put it on, but after awhile we adjust to it, and forget about it. When others come close, it might be easily detectable by them, because it is a change in their olfactory stimuli. When we walk into our houses or offices, we may remember their old familiar smells, but after a few minutes, we adjust, and stop noticing them. Anytime our internal chemical levels change, this can impair our olfactory sensitivity. This would be most obvious in the case of smoking.

Here's how to remember that olfaction is the sense of smell: imagine walking into a dusty, greasy old factory.

O L F A C T I O N = noun

O L F A C T O R Y = adjective // the smell of an OLD FACTORY

Gustation is the sense of **taste**. Gustation uses at least four different kinds of taste receptors on the [tongue](#): sweet (located at the tip of the tongue), bitter (located at the base of the tongue), salty, and sour (located on the sides of the tongue). Perhaps you are thinking that you can detect more than four different flavors, and you are right, because complex flavors are determined by much more than mere individual tastes, or even blends of tastes. The perception of flavor also depends upon the interaction with the other senses, especially smell. This is why wine connoisseurs try to smell the wine before tasting it. Restaurants also know that the visual presentation of the food is important in the customer's overall satisfaction.

The tongue is an organ covered with skin, so all of the cutaneous senses come into play in the perception of flavor. The temperature of the food should match the diner's expectation. Some people experience great disappointment the first time they try Spanish *gazpacho* or Russian *borscht* because most Americans are accustomed to being served hot soup. The texture of the food is also measured by the tongue, and we expect some foods to be crunchy, others smooth, others coarse, others chewy. The pain receptors of the skin on the tongue come into play when we eat chile. With dining experience, and aging, people's taste preferences may change. You can build up your pain threshold, and increase your tolerance for chile.

Case Study: Ms. T is now in her 80s living with family. She always liked a teaspoon of sugar in her morning coffee. After age 60, she noticed that she preferred two teaspoons. Now she has developed a mild case of dementia, and she forgets what she has just said, done, heard or seen. When her grandson prepares her morning coffee, he puts in three teaspoons of sugar, and she responds, "Whoa, not so much!" Then she waits a couple of minutes for it to cool, and she tries it. "Ugh, you forgot my sugar" and she puts in another teaspoon. Her loss of sweet sensors is not a direct result of her dementia, just another collateral effect of aging.

How to remember

G U S T A T I O N = eat the food with GUSTO because it tastes so good

Audition is the sense of hearing and involves the detection of sound waves.

After processing the sound wave through the outer ear and inner ear, the neural impulse is sent along the auditory nerve to the temporal lobes. There are three dimensions to the sound wave: loudness, pitch, and timbre.

Decibels	Examples	Danger after
10	Normal breathing	
20	Whisper	
40	Quiet office	
50	Quiet restaurant	
60	Normal conversation	
70	Noisy restaurant, normal traffic	
80	Alarm clock at 2 feet	Over 8 hours
90	Heavy traffic, power tools, lawn mower, food blender, Niagara Falls	Less than 8 hours
100	Chain saw, pneumatic drill	Less than 2 hours
110	Riveter, Stadium crowd	
120	Rock concert in front of speakers, sandblasting, thunderclap	Immediate danger
140	Gunshot, jet plane at 50 feet	

Volume (loudness) is determined by the height of the sound wave (the amount of energy it contains). An explosion has much sound wave pressure, while a whisper has very little. Loudness is measured in **decibels**. A quiet office may be about 40 decibels, a normal conversation about 50, street traffic about 60, louder with horns, sirens, and screeching breaks. The key decibel level to remember is 90, because **prolonged exposure to sounds above 90 decibels can lead to permanent hearing loss**. Some industrial machinery, aircraft engines, music in nightclubs (or even earphones) may easily exceed 90 decibels.

Case Study: Mr. L, in his 70s, now has to wear hearing aids in each ear if he is to hear normal conversation. He had excellent hearing as a young adult, but worked for forty years in a factory running a machine that was louder than 90 decibels. Now, Mr. L's former company requires operators of those machines to use earplugs for protection.

Pitch (tone) is another dimension of audition. Pitch is **determined by the frequency of the sound wave**, and is measured in cycles per second. Pitch is detected in the organ of the inner ear known as the cochlea, which has thousands of hairs at different lengths. The different hairs vibrate to the different pitches, and send a neural impulse down the auditory nerve. Human hearing ranges from a low of about 50 cycles per second to a high of about 20,000 cycles per second. This top end is much lower than that of other animals. This is why cats and dogs (who can hear up to about 25,000 cycles per second) can be trained to respond to a whistle that cannot be heard by humans. Bats can hear well above 50,000 cycles per second, and use this sonar to navigate their way around dark caves by emitting high pitched screeches and listening for the echoes. Within humans, pitch sensitivity varies greatly between individuals, and over the life cycle.

Case Study: About forty years ago, a major state mental hospital closed in northern California, and the local news media reported that most of the patients would be living in half way houses within the community. The next week, a totally unrelated event occurred: a new shopping center opened on the west side of San Jose. On the first day of operation, the young assistant manager of one of the stores was confronted by an irate customer who said that she could no longer remain in the store because of the horrible screeching sound. The assistant manager was initially puzzled, because neither he nor any other workers or customers had heard anything akin to the distressing sound reported by that one customer. Remembering the closure of the state mental hospital, he inferred that the customer had been one of the patients released by the hospital, and that she had been experiencing some kind of hallucination. However, over the next week, several other customers had a similar complaint. Sensitive listening equipment was brought in and verified that a loud sound of about 20,000 cycles per second was being produced by an improperly lubricated escalator. This was beyond the range of most individuals' hearing, but for those with great high end sensitivity, the sound was extremely annoying.

Case Study: Ms. P was a widow in her 70s. She showed no signs of dementia, but had a progressive high end hearing loss. One day her daughter arranged to come by and take Ms. P grocery shopping. As the daughter noticed she was running late, she called from her cell phone and told Ms. P to wait outside on the porch when she drove up, and that the weather was looking pretty bad, so she better

wear a raincoat and hat. When the daughter drove up, she noticed Ms. P on the porch, wearing a raincoat, but no hat, so she yelled to her mother, "Your forgot your hat." Ms. P responded "What?" The daughter repeated: "Go inside and get your hat. I want you to bring your hat." Ms. P looked a little confused and perturbed, but she obeyed and came out carrying her cat, muttering "I don't know why I have to bring the cat to the store. I know what kind of food he likes. No one else brings their pets to the store." Because consonants like *h* and *c* are very high pitched sounds, Ms. P had a hard time hearing the difference between *cat* and *hat*.

Weber determined that of all the sensory modalities, the one with the smallest value for the "just noticeable difference" was the detection of the pitch of a tone. That is why we can listen to adjacent keys on a piano, one right after the other, and determine that they are different notes, even if we do not have the "perfect pitch" that would allow us to identify which notes they are.

Timbre is the third dimension of the sound wave, and involves **overtones**. A tuning fork has a pure sound wave, but most musical instruments have a rich complexity that means that we can hear the difference between a trumpet and a violin hitting the same note at the same volume. Each human voice has a voice print as unique as a finger print or DNA. **White noise is a sound that blends all different frequencies**. Examples of white noise include the sound of a waterfall, or wind rustling through the trees. Many people find this quite relaxing, and it tends to obscure other sounds.

Case Study: Dr. T is a clinical psychologist who has just become licensed to practice psychotherapy. She has just rented a two room suite in an older building in a busy downtown area. She eventually hopes to put a receptionist in the first room, which will also serve as a waiting room for patients. The other room, which has windows on the street side, will be for individual psychotherapy sessions with her patients. Dr. T noticed that the street noise was a little loud, and that the door and walls between the two rooms was a little thin. She worried that the street noises might distract the patients, and make it hard for them to relax. She was also concerned that the poor insulation might make it easy for someone in the waiting room to overhear the private conversations that take place in psychotherapy. Dr. T purchased a sound screen for under a hundred dollars. Like a fan, this sound screen circulates air but produces more noise than air circulation. These appliances are also known as white noise generators. They serve to mask the patient's perception of the street noise, and reduce the ability of someone in the waiting room to hear what the patient is saying.

Vision (sight) is the sense that detects light waves. Light is the visible portion of the electromagnetic spectrum that includes everything from x-rays and ultraviolet tanning rays on one end to television broadcasting and infra-red on the other end. There are three dimensions to the light wave: brightness, hue, and saturation.

Brightness is the intensity (amount of energy) of light coming from a source (or reflected off of a surface). White surfaces have the capacity to reflect the most light. That is why projection screens are white, because of their ability to reflect more light energy back to the audience. If you go out on a hot, sunny day, and wear a white shirt, it will reflect most of the sun's energy away from your body. If you wear a black shirt, it will absorb most of the sun's energy, and you will get very hot very soon.

Rods are the eye's brightness receptors, and are important in **night** vision. Nocturnal predators like owls and cats have mostly rods. In the human eye, there are no rods in the fovea (the area of central focus), but they are off to the side about 30 degrees. Here is how to remember the role of the rods in seeing night brightness. Visualize this scene: over fifty years ago teenagers would get old cars, paint them a bright, metallic coat, and cruise these "hot rods" around on warm summer nights.

Hue (color) is the dimension that is determined by the wavelength. Each color on the color wheel can be defined in terms of its wavelength in nanometers.

Wavelength	Electro-magnetic radiation	Effects
Shortest	Gamma rays	Very harmful to tissue
	x-rays	Harmful with over-exposure
	Ultraviolet rays	Tanning, sunburn, cancer possible with prolonged over-exposure
400 - 700 nanometers	Visible spectrum	Hues of rainbow
	Infrared	Warmth
	Microwaves	Rapid heating
Longest	Broadcast	TV, AM, FM

Cones are the eye's color receptors, and are important in **daytime** vision. Chickens have only cones (no rods). When the sun goes down, chickens cannot see, so they go to sleep. When the sun comes up, they get busy looking, and scratching and pecking. In the human eye, cones are tightly packed in an area of central focus known as the fovea. Here is how to remember that cones process color vision. Visualize yourself on a hot summer day, going down to the ice cream parlor, ordering a very large cone with scoops of different colors: cherry (red), berry (blue), and pistachio (green).

Color blindness is where a person has no cones. Such individuals can still see, but everything is going to look like a **black and white** movie. Complete color blindness is rare, especially in females. Many individuals do experience some color weakness in which it is hard for them to distinguish between two colors. That is one reason why stoplights are always arranged in the same pattern: red on top, yellow in the middle, and green on the bottom, so even when someone is cannot tell the color of the light, at least he can infer whether he should go or stop by the position of the light.

Case Study: Mr. V was an 18-year-old student. He told me on the first day of class that he was completely color blind. He was not just preparing me to see socks that did not match. He explained that if he looked directly at something, he could not see it (for the fovea contains only cones, and he had no cones). He could only see with his rods, and so he seemed to be looking askance when he was talking to you. He thought it wise to inform me of this disability because otherwise I might observe him during a test, with his eyes wandering, and I might make the inference that he was cheating by trying to see his neighbor's answers.

Saturation is the mixture of different wavelengths. A "color" with greater saturation has greater purity of wavelength. If you have two red shirts, and one is a redder red, truer red, deeper red, fuller red, that is what we mean by saturation. Brown represents a "color" lacking in saturation. Perhaps you remember in elementary school when you learned how to create brown by coloring over yellow, blue, and red, and the result was a brownish mixture of all three.

The rods and cones detect the brightness and hues of visual images and transduce these into neural impulses that go down the optic nerve to the occipital lobe of the cerebrum. About a third of incoming cortical neurons are related to vision: a higher proportion than that found in any other human sense.

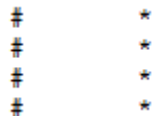
QUESTION #5.3: What is figure/ground perception?

Perception is when the brain organizes and interprets the incoming neural impulses from the sensors. Perception is this process of becoming aware of the environment via interpretation of information from the senses. There are some differences between individuals in terms of sensory acuity: some people can see or hear better than others. However, these sensory differences are minor in comparison to perceptual differences. Two people seeing the same sight or hearing the same sounds might perceive very different things, based on how those people might differ in terms of experience, expectation, context and motivation.

Case Study: Mr. B and his wife were watching the sun go down at a beach on the west side of Acapulco. Then they wanted to get back to their place downtown. They walked to the street and waited a few minutes for the bus to come by. Mr. B was thinking of how thirsty he was getting, and about the six pack of beer he had at home, so he said "Why don't we start walking down the right side of the street down to the corner with the highway, where other routes of busses pass. If one of these busses comes by, we can still take it." Just then a large, noisy truck came by, and his wife responded to his idea. Mr. B had heard the words "ice" and "back" so, thinking of his beer, he turned into a little store to get a bag of ice to take back with them, and then he started to walk along his proposed route. He noticed that his wife seemed a little angry, but did not find out until later why. What she had really said was "I don't have eyes in the *back* of my head" which reflected her concern that if they started walking in that direction, they would not be able to see the approach of a bus from behind. But Mr. B only heard (perceived) what matched his motives (having a cold beer).

Figure/ground perception is where we focus on certain stimuli that are the most relevant, and ignore the rest, pushing them into the background. This can occur in any sensory modality. A driver might scan visual field through the windshield, focusing on the figure of a sign indicating the desired off-ramp, while he ignores all the billboards advertising eating places. If he were less interested in finding a particular off-ramp, and getting very hungry, he might be focusing on the figure of a billboard about a fast food place, pushing the signs about upcoming off-ramps into the background. The hostess at a **cocktail party** in her home hears noises from a dozen conversations, but she focuses her attention on what her boss is saying, ignoring what the neighbors are saying a few feet away. Later she hears her baby start to cry upstairs (the figure perceived), and excuses herself to see if the sitter needs any help, allowing all the downstairs conversations to fade into the background.

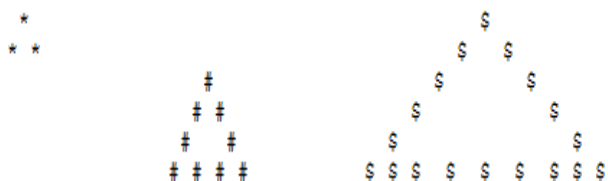
External cues to figure/ground perception include **contrast and similarity**, nearness, and holism. We tend to group together into one figure things that are similar, and then contrast them with things which are dissimilar. Below most people will usually perceive two vertical columns, one of composed of * and one composed of #.



We tend not to perceive these figures as four rows, each containing both a # followed by a *, because the similarity cue encourages us to group together that which is similar to form a complete figure of our focus: the vertical columns. However, when too many dissimilar things are present, this may create some interference that makes perception of the figure more difficult.

Nearness refers to the cue that encourages us to group together things having the greatest physical proximity, to treat them as distinct figures. Look at the above array again: similar stimuli grouped together and set apart from contrasting stimuli. However, if we increased the vertical distance between the similar stimuli, and decreased the horizontal distance between the contrasting stimuli, you would be more likely to perceive these same stimuli as four rows of # * instead of the two columns you initially perceived.

Holism refers to the cue of perceiving standard, familiar whole figures, as opposed to irrelevant parts. We piece together those partial stimuli that would fit together to fit a standard whole. We perceive all the following as triangles, even though they differ in composition, size, and angles. Cartoonists know that they can express familiar forms that lead the viewer to perceive the rest of the whole.



QUESTION #5.4: What is depth perception?

Depth perception is how organisms are able to perceive depth from the two dimensional neural impulses coming from the retinas of the eyes. Depth cues include binocular vision, overlap, shading, relative size, height on the horizon, and linear perspective.

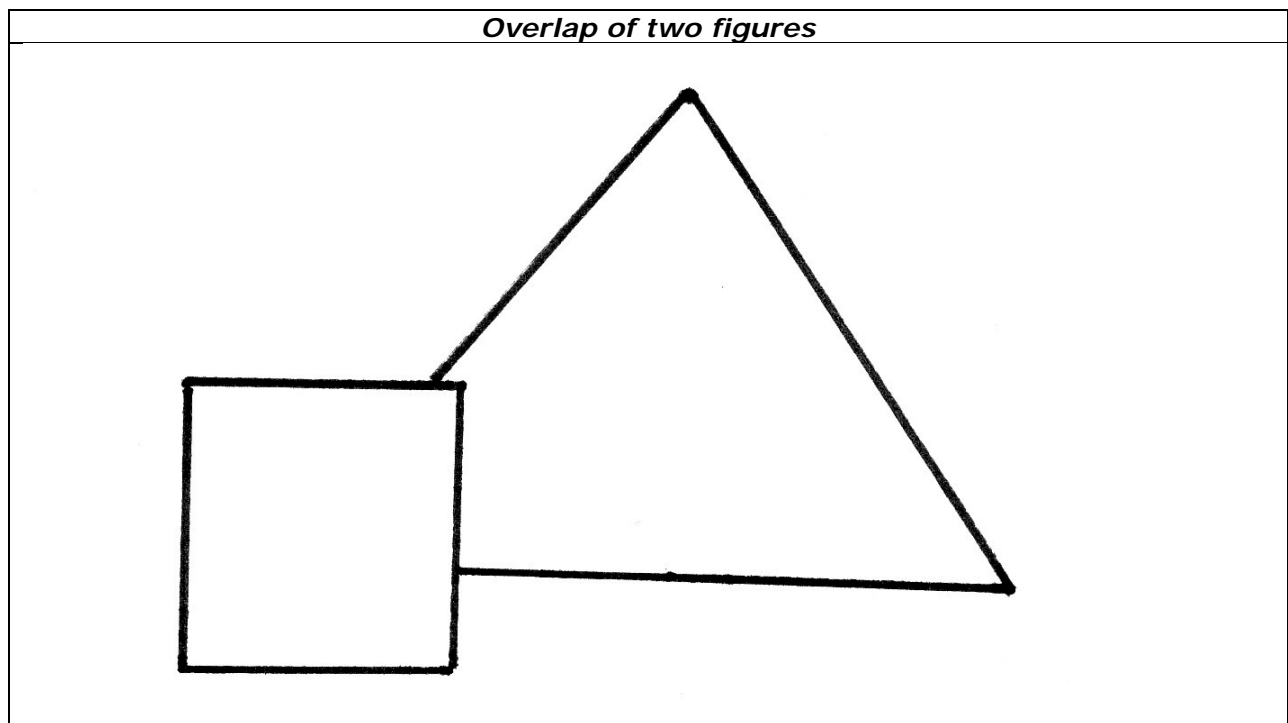
Binocular (or stereoscopic) vision refers to the fact that each of the two eyes sends different neural impulses to the occipital lobe. When the object is close to the face, the difference between what the right eye sees and what the left eye sees is great. As the object moves away from the face, the difference in what is reported by each eye becomes less and less. The brain calculates the differences between the impulses from each eye, and estimates the distance of the object. However, most depth cues are monocular, and can work with just one

eye. This is why over a thousand individuals licensed to fly as private pilots have functional vision in only one eye: they still have enough depth perception to land an airplane.

Motion parallax helps depth perception. When we are in motion and observing stationary objects (such as from the side window of a train or car). Distant objects (such as the moon) seem to move forward with us, but objects closer to us (such as signs along the side of the road) seem to be moving backward.

Shading is a cue to depth because we assume that light comes from the top (the sun outside or the lights in the ceiling). We can then infer if a change in shading indicates if something is popping out (or going into) a surface.

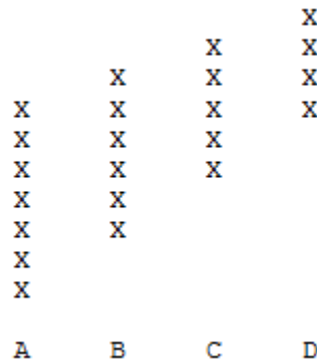
Overlap helps us judge the relative distance of two objects. We see that one figure appears to cut into our view of the other, and we infer that the one **superimposed** on the other must be the closer of the two. Use of this depth cue is somewhat dependent upon our use of holism as a figure/ground cue, for we are assuming what each of the complete figures must look like, without the overlap. Here we assume that the square must be closer than the triangle, and is blocking our view of part of its left side.



Relative size is a cue to depth based upon our experience that objects closer to us take up a larger portion of the retinal screen. If we assume that the two squares on the next page are of equal size, then we will infer that the one on the left must be much closer than the one on the right.



Height on the horizon is a depth cue based upon our experience of distance objects appearing higher up on our retinal screens. **Linear perspective** is a tool used by visual artists to convey the perception of distance on a flat canvas. Linear perspective is actually a combination of two other cues: relative size and height on the horizon. Imagine that the figures below are telephone poles. As we move from left to right, the artist has started each one up higher on the horizon, and making it smaller, and this creates the perception that an object at point D must be farther away than an object at point A.



QUESTION #5.5: What are perceptual constancies?

Perceptual constancies help in the visual perception of motion. There are size, brightness, and shape constancies. An example of **size constancy** would be when I take a basketball and pass it to another player further down the court. When the basketball is close to my face, it occupies a major portion of my retinal screen. As it moves away from me to the other player, the basketball occupies a smaller and smaller proportion of my retinal screen. I do not interpret this decreasing visual screen as a physically shrinking basketball. Rather, I assume that the basketball remains a constant size, and is in motion away from me. **Brightness constancy** involves an object moving through an area of shadows. When I see a car drive down a shaded lane, I do not perceive the car as changing its brightness, but as an object of constant brightness moving across a background of changing brightness.

Shape constancy explains that when an object moves by rotating with respect to my visual field, and casts a different shape upon my retinal screen, I perceive it is an object of constant shape in rotational motion. When my line of vision is perpendicular to a wall, a closed door makes a rectangular shape on my retina. If the door is opened away from me, the edge of the door rotating out is further away, a smaller portion of my visual screen, giving the entire figure more of a trapezoid shape, but I perceive this as a door maintaining its rectangular shape, opening away from me.

Cue or constancy	Figure/ground	Depth	Motion
Similarity and Contrast	Similar things are perceived as part of the same figure		
Holism	Things that approximate familiar figures are perceived as those figures		
Nearness	Things that are close to each other are perceived as going together		
Binocular vision		Different views from each eye leads to an estimation of distance from the face	
Overlap		Images which are superimposed on others are perceived as being closer	
Height on horizon		Images which are higher are perceived as being farther away	
Relative size		Images which are larger are perceived as being closer	Changes in size lead to inferences about motion
Shading		Brightness and shadows lead to inferences about positions of objects	Changes in shadows and brightness lead to inferences about motion
Parallax		Objects which move forward with us are perceived as farther away, while those which move backward are perceived as near	Changes in nearby objects lead to inferences about motion
Shape			Changes in shape lead to inferences about motion

QUESTION #5.6: What are illusions?

An **illusion** is a misinterpretation or mismeasurement of a real physical stimulus. Do not confuse this term with an allusion (which comes from the verb "to allude") and refers to a literary reference, or with elusion (which comes from the verb "to elude") and means to get away or escape. There are also two psychological terms that are frequently confused with illusion: delusion and hallucination.

A **delusion** is a false belief, especially one characteristic of certain mental disorders. As we shall see, depressed patients have delusions of helplessness and hopelessness; paranoids have delusions of persecution; hypochondriacs have delusions of ill health; anorexics have the delusion of being overweight; phobics have a delusion of excessive danger. The main difference between illusion and delusion is that illusions are experienced by normal people everyday, and are not symptomatic of mental disorder.

	HALLUCINATION	DELUSION	ILLUSION
<i>Definition</i>	Sense experience without a physical stimulus	False belief	Mismeasurement of a stimulus
<i>Causes</i>	Metabolic disturbance	Threat to self esteem	Perceptual habits or alternation of physical stimuli
<i>Present in dreams</i>	Yes	Yes	Yes
<i>Present in mental illness</i>	Yes	Yes	Yes
<i>Present in normal people in normal states of consciousness</i>	No	No	Yes
<i>Examples</i>	Schizophrenic hears voices Dreamer sees a monster	Paranoid is suspicious Depressed patient is hopeless	Doppler effect Mirage Miller-Lyer

Hallucinations are sensory perceptions in the absence of any physical stimulus. Hallucinations can occur in any sensory modality, but most are visual (seeing something which is not there) or auditory (hearing something which is not there). Most hallucinations occur in altered states of consciousness, such as delirium, schizophrenia, drug-induced states, or (as we shall explain later in this chapter) in dreams. Normal people in normal states of consciousness do not experience hallucinations, but they frequently experience illusions.

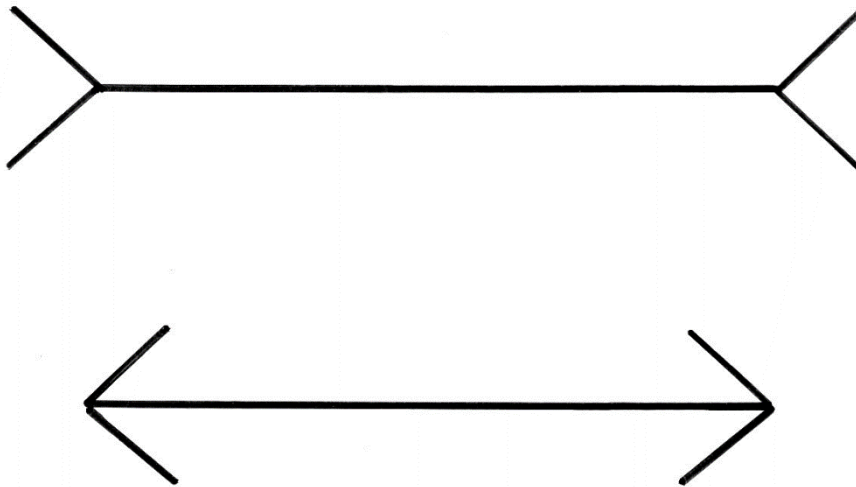
Case Study: Mr. B was lying down in his bed on a summer's evening. He was trying to sleep, but it was a warm night. Through the open window he thought he heard a baby cry. He went outside, worried that some infant or toddler might fall into his swimming pool. He turned on the yard light to see the cause of the noise: two male cats getting ready to fight. This was not a hallucination; Mr. B really did hear a noise. This was an illusion. Mr. B had misinterpreted the noise of the cats and perceived the cry of a baby.

Physical alteration of stimuli causes some illusions. A stick placed in water appears to be bent, but it really remains straight. What was bent by the water was the light waves traveling to the eyes, leading the viewer to conclude that the stick had been bent. A similar explanation applies to the mirage of water on a hot desert road: the heat from the road has bent the light waves until they look wet. Some auditory illusions can be explained by physical alternation of a stimulus. The Doppler Effect explains the illusion that when one is standing at a train station, a rapidly approaching train's whistle seems to be ascending in pitch, but as the train passes, the pitch of the whistle seems to descend. To someone on the fast moving train, the tone of the whistle has remained constant. The reason for this is the alteration of the physical sound wave: each peak of the approaching soundwave came a little bit sooner (increasing frequency) while each peak of the soundwave of the whistle of the departing train came a little later (decreasing frequency).

Most illusions are due to perceptual habits rather than physical factors. These habits involve expectations that tie in with cues to figure/ground, depth, and constancies. One of the most famous optical illusions is the Muller-Lyer. Most people see line segment AB as longer than that of CD, when actually they are of equal length. One explanation for this is that we habitually perceive depth within the context of right angle and cubicle architecture. This means that we perceive the line segment as being a distant inner corner of a room, and therefore, because it is the same size on our retina, it must be a longer line. Persons who grow up in small villages of circular architecture are less likely to be fooled by this illusion.

Case Study: Don C is now past 90. He grew up and still lives in a mountainous area of Mexico. His village did not even have electricity until he was past 70. The roads and paths are still windy, rather than straight or right angle intersects. The indigenous architecture still prevails: round bases with a conical thatched roof. Despite his age, Don C shows no signs of dementia. His hearing is somewhat diminished by years of firing his rifle, but his near vision is still good. When shown the Muller-Lyer illusion, he immediately determined that the lines were of similar length.

Muller-Lyer illusion: the horizontal lines are actually equal in length



QUESTION #5.7: What are dreams?

An altered state of consciousness (ASC) is a way of experiencing which is fundamentally different from normal waking consciousness. Examples would include delirious conditions, meditative trances, and drug-induced states.

Dreaming is an altered state of consciousness occurring during the lightest stage of sleep. When the sleeper is in the first four hours of sleep, most of the time is spent in the deepest stages that help replenish the body. As the sleeper comes up into light sleep several physical measures indicate that dreaming is taking place. The EEG would have some similarities to an individual in an awake, but relaxed (alpha) state. The eyes start to move under the lids, as if these **rapid eye movements (REM)** were trying to follow the action of the dream. **Dreams can be described as a series of hallucinations and illusions** occurring during light sleep.

Most movements in dreams are blocked by a muscular inhibition. A few movements (such as a slap) or a few words (usually garbled) may get past the muscular inhibition of sleep. Dreamers are not capable of carrying on complex conversations or performing complex actions. "Sleep walking" is actually something different, a mild dissociative reaction.

Case Study: When Mrs. B was a newlywed, she and her husband lived in a tiny apartment, and slept on a mattress on the floor. They both worked full time and took classes at night. One night her husband got to bed quite late, and she had already been asleep for several hours, tired from a hard day. Mr. B could not resist kissing his lovely, sleeping wife as he too crawled into the covers, and then rolled over. But immediately, he felt a fist on the side of his head. He turned over to see why his wife had hit him, but she was still asleep. The next day at breakfast she was very excited to tell her husband about the dream that she had had the night before. "I was making bread here in the apartment, when the doorbell rang. It was a Western Union delivery boy with a telegram for me. It was great news: my sister had a healthy baby girl. I was so very happy that I wanted to give the boy a tip, but I had no money, so I just gave him a piece of bread. He ate it, but then he tried to kiss me so I hit him." In her dream, the ringing doorbell and the delivery boy were hallucinations because they did not happen, but the kiss was an illusion, a real physical stimulus that was misinterpreted in the dream.

Most people dream several times a night, averaging four or five dreams in an eight-hour period of sleep. The first four hours involve more time in the deeper stages of sleep, while the last four involve more time in the lighter stages, and more periods of dreaming, and longer periods of dreaming. Many people wake up from the night's sleep while they are in their last dream of the night.

Most people do not remember any dreams from the previous night. If they do, it is the last dream that is most likely to be remembered. The earlier dreams are most likely to be forgotten, and if they are remembered, they are usually perceived as parts of the last dream. Dream recall can be improved by setting a habit of writing down the dream before you leave your bed in the morning. For the first week or so, the dreamer may give up after spending a few minutes trying to recall the dream, but after a week of this focus, dreams are more frequently remembered and they become more elaborate. The same trend can be seen in those forms of psychotherapy emphasizing dream work.

Case Study: Mr. G was a 35-year-old Silicon Valley engineer. He sought therapy for unresolved anxiety about interpersonal relationships. The psychotherapist decided to focus on dream analysis to get around some of the intellectual games which the patient was attempting to play. For the next three sessions, Mr. G claimed that he could not remember a dream. He then employed some of the dream recall techniques proposed by the therapist, and brought in a short dream. Mr. G was pleased with how this opened up the course of that therapeutic session, and had at least one dream for each of the remaining weekly sessions. The dream reports also increased in length and complexity.

Whether the dream content described by the patient is a valid recount of what was actually experienced in the dream is a matter of debate among psychotherapists and sleep researchers. One possible explanation is that the dream is just a few jumbled images and experiences, and that any real meaning is created later by the dreamer as she remembers, tells, and self-interprets her dream. Indeed, the remembering, telling, and interpreting of the dream may not be separate phases, but interacting aspects of the same process.

Case Study: Mr. V is a graduate student at a major university. He has been in Jungian therapy for two years. When he began therapy, he too found it difficult to remember his dreams. After about a month, he remembered dreams for most nights. After three months, he noticed that the dreams were more highly structured and detailed, and would fill up most of the therapy session. Now most of his dreams have Jungian symbols, and the typical session has Mr. V telling and explaining his dream, with his analyst playing more of a role of an observer and guide, making sure that Mr. V is on the right path with his own dream work.

Many people become convinced that their dreams are **precognitive**, giving them insight into future events. Most people have had several of these dreams or other *deja vu* experiences in which they become convinced that a new experience has already been experienced before. This is best explained by a confirmation bias of sampling, and by how later situations reconstruct our memories of our dreams. Let's do the math: five dreams a night, 365 nights a year, that is over thirty-six thousand dreams by the time a person is twenty, and the details of the remembered dreams are unconsciously made to fit the details of the events as they later came to pass.

When people are deprived of sleep for more than a couple of nights, they tend to become physically exhausted and mentally agitated. They may even begin to hallucinate while awake.

QUESTION #5.8: What is hypnosis?

Hypnosis is an altered state of consciousness characterized by relaxation, focused attention, and increased suggestibility. Hypnosis is used in several tribal cultures as part of shamanic rituals of spiritual passage and healing. A similar practice was probably used by ancient Egyptian and Greek physicians, who had to operate without anesthesia, and found hypnosis useful in controlling the perception of pain.

About 250 years ago, hypnosis was rediscovered by an Austrian physician, Franz Anton **Mesmer**. After using it clinically, he went to Paris where he used his Mesmerism (or animal magnetism as he called it) to entertain at the parties of the nobility, much as stage hypnotists do nightclub acts today. One of his most popular acts was to get stuffy guests to act foolishly, as if they could not walk, talk, or see. By the 1880s several Paris physicians had the idea that if Mesmerism could make normal people act as if they had a hysterical disorder (what we now call somatoform or conversion reaction), then perhaps hysterical patients could be hypnotized to act normally.

Jean Martin **Charcot** became the most famous of these French psychiatrists, treating hundreds of patients at the women's mental hospital outside of Paris. He found that the most effective way to use hypnosis was to regress the patient back in time before the onset of the disorder. Charcot discovered that in many cases patients reported an emotionally traumatic event (such as sexual abuse in childhood) and that the hysterical disorder was a sort of mental block to prevent remembering the trauma. Under hypnosis, that mental block could be gotten around, and the patient could relive the trauma.

Sigmund **Freud** was a young neurologist in Vienna who heard about Charcot's work, and decided to go to Paris for residency training in psychiatry. When Freud returned to Vienna to set up a private practice, he came to two conclusions. One was that he himself was not a very good hypnotist, and so he decided to use a different technique to probe the unconscious minds of his patients: talking to them (and that was the birth of modern psychoanalytic psychotherapy).

Freud also concluded that when a female patient reported recovered memories of having been sexually abused at an early age by her fathers, that these were not factual memories being recalled. Rather, the hypnosis had liberated the patient's Oedipal fantasies about desiring her father's sexually.

Even today there is a great debate about what patients describe under hypnosis (or the altered state of drugs like sodium pentothal, "truth serum"). **What the patient reports may be a factual memory, repressed by emotional trauma, or what the patient reports may be a false memory, a pure fantasy concocted by the patient** at that point during the highly suggestible state in hopes of pleasing the therapist.

Most people have some level of hypnotizability, especially children and those prone to hysterical disorders (such as what we now call dissociative reactions or "multiple personality"). The hardest people to hypnotize are the highly suspicious, schizophrenics, and dementia patients (because they lack the ability to focus the attention).

The value of hypnosis beyond the control of pain is debatable. Hypnosis does not seem to greatly increase mental or physical performance, otherwise coaches should hypnotize their teams and professors should hypnotize their students to concentrate and do better.

QUESTION #5.9: What are psychic phenomena?

Psychic phenomena are supernormal events or abilities claimed by some people. The term psychic can also be used as a noun to describe someone who claims these abilities. **Parapsychology is the study of psychic phenomena** such as channeling, psychokinesis, and extrasensory perception.

Channeling is the ability to communicate with disembodied spirits. This is sometimes done in the practice of holding a **seance** in which the psychic (or medium) goes into an altered state of consciousness (trance). The spirits (perhaps demons or souls of deceased loved ones) then talk to or through the medium.

Case Study: Dona A is a woman of mixed African-Indian extraction who was born in a small mountain village outside of Acapulco. She went to the city where she worked as a maid in a hotel and earned good money. Then she became very ill, and went to several physicians, but none could help her. Then in one of the slums of Acapulco she found a group of spirit doctors (women of background similar to her own). One of the spirit doctors put on a white robe and went into a trance, then spoke in a strange voice (that of a spirit) who diagnosed Dona A's problem as that of the evil eye: another woman from her village had become jealous of Dona A's relative success and had sought a local *brujo* (sorcerer) to put a hex on her. But the spirits contacted by Dona A's spirit doctor were stronger, so the hex was undone, and Dona A got better. Dona A is now so committed to this

practice of channeling, that she herself is studying to become one of the spirit doctors. She keeps up her work as a hotel maid, remains a practicing Catholic, and still goes to the national health service when she gets a flu, or injured on the job, but she is convinced of the reality of spirit channeling and exorcism.

There is no way to empirically verify such claims. We can interview Dona A and her "spirit doctor" and observe how they practice their craft (e.g., they do not charge huge fees for their services) and we can infer that they are sincere. However, we cannot empirically verify what is really being done. Is it contacting disembodied spirits or is it hallucinating?

Possible fraud is one reason why most scientists remain skeptical about channeling and other psychic claims. There have been many examples of criminals who have sought to use their victims' belief in these powers in order to take advantage of them. Even when there is no criminal intent, fraud might come about because the psychics want to maintain a position of attention and importance.

Case Study: In the 1850s in upstate New York, the Fox family moved into an old farm house. The father heard his two daughters giggling loudly the first night. He went into their room to see what was the matter. The girls said that they were talking to Mr. Splitfoot, the ghost of the Dutch farmer who used to have the house. The father himself then heard loud clicking sounds. Someone could ask a question, and there would be one click for yes, or two for no. People came from miles around to witness this conversation with the ghost, which only seemed to work in the presence of the Fox sisters. After the Civil War, they became quite famous, and traveled around doing seances so that the bereaved could talk to their war dead and hear the answers as one click for yes or two for no. In 1920 on her deathbed, the younger of the two sisters admitted it was a trick. Her sister had learned to pop her big toe. The girls thought it up just for fun, but when the adults paid so much attention to it, they decided to keep it up.

Psychokinesis is the psychic ability that claims to influence physical energy, events, and/or objects without using one's muscles. One example of this is levitation: using one's powers of concentration to get objects to defy the force of gravity. When studied under controlled laboratory conditions, claims of psychokinesis are usually found to be fraudulent.

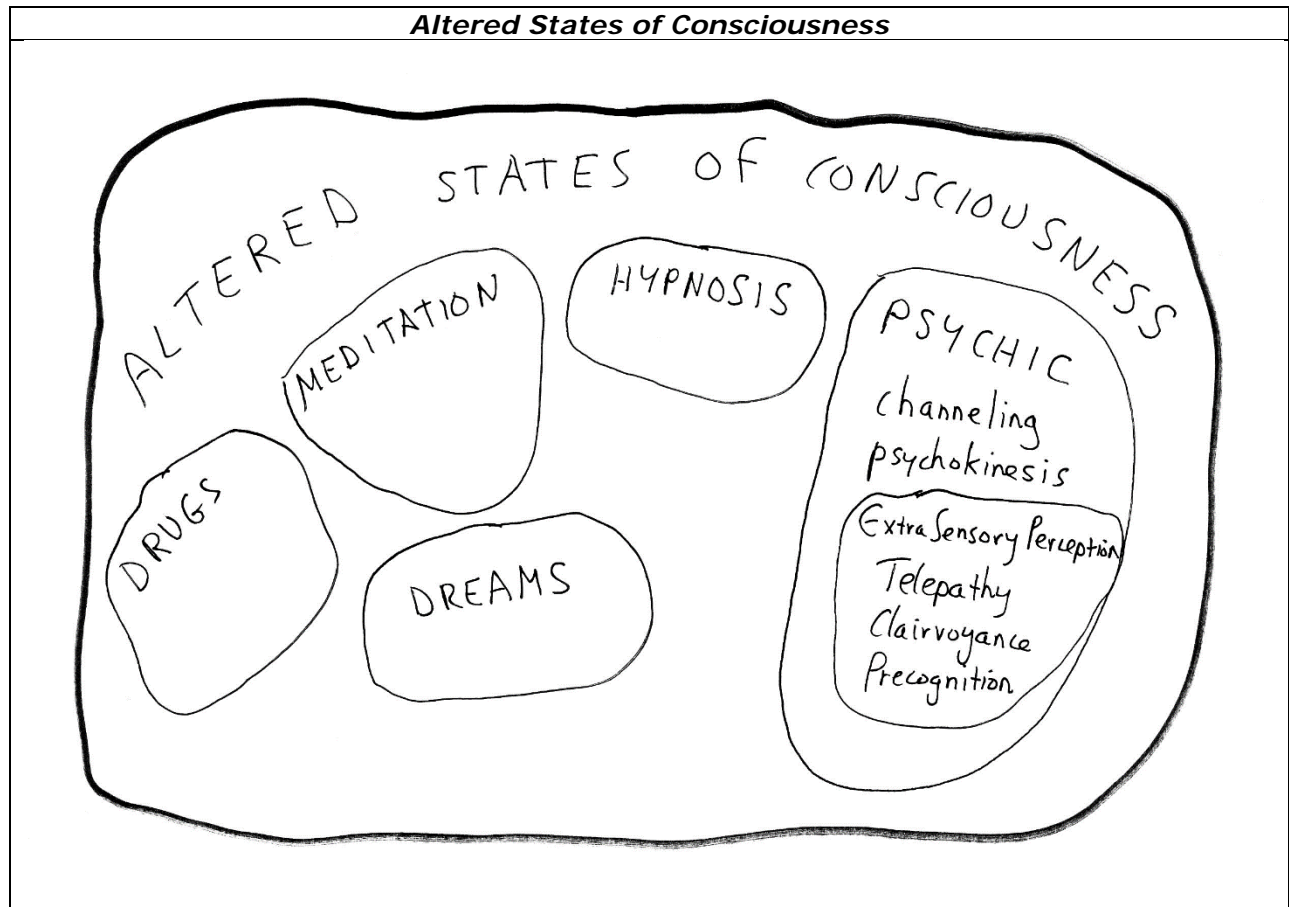
(P S Y C H O) (K I N E S I S)
MIND MOVEMENT

Case Study: Mr. L was born in a tiny Russian village in 1940, and his family barely survived the starvation of the Second World War. Even later, life was hard on the collective farm. When he was twenty, Mr. L went to Moscow and convinced the officials that he had a special psychokinetic ability. He showed them that he could suspend small objects above the ground. He argued his way into a position in which he would spend all day long practicing his ability, so that some day he might be able to use it to destroy incoming missiles. He got a tiny apartment and a food ration card. When the Soviet Union fell, western reporters came to Moscow and interviewed psychics such as Mr. L. The reporters were quickly able to identify the sleight of hand he had used: a tiny thread stretched between his knees to suspend the small objects. Mr. L was not good enough to have made it on the Las Vegas stage.

Extra sensory perception (ESP) involves gaining knowledge about things external to the mind without use of sensory input. There are three forms of ESP: telepathy, clairvoyance and precognition. **Telepathy is thought transference: the ability to read the mind of another person. Clairvoyance is remote viewing: the ability to perceive persons, objects, or events despite the presence of distance or obstacles. Precognition is foretelling the future** and has taken the forms of soothsaying, augury, divination, astrology, and fortune telling.

Most scientists, including **psychologists, remain quite skeptical about claims for ESP and other psychic phenomena.** In addition to some obvious cases of fraud, the greatest problem concerns lack of good research design. In those cases where there is a success rate above that expected by pure chance, there is usually some defect of design (such as another possible explanation as to why the receiving subjects in the research were able to come up with the knowledge). In those studies where there is careful methodological control, the results are rarely statistically significant.

Some psychics have responded to these data by saying that by their very nature psychic phenomena are not normal, and cannot be studied by normal empirical techniques. The kind of situations leading to ESP are situations involving great danger or great emotions, and this is not the same as the conditions which exist in identifying randomly selected cards and numbers in a parapsychological laboratory.



UNIT 6: LEARNING

QUESTION #6.1: What is classical conditioning?

Learning is a change in behavior due to the organism's experience with the environment. The simplest form of learning is **conditioning**, which can be reduced to a basic **reflex** relationship between stimulus, organism, and response.

STIMULUS	ORGANISM	RESPONSE
= what just =	= the person =	= what the =
= happened =	= or animal =	= organism now =
= in the =	>= who has >=	>= thinks, feels, >=
= organism's =	= just been =	= or does =
= environment =	= stimulated =	= =

Not all reflexes are learned. Many reflexes are the result of heredity. The stimulus might come from the environment, but the reflex itself (the relationship between the stimulus and the response) can be pre-programmed inside of the organism. One example would be the spawning habits of the salmon fish. Salmon don't need special training or orientation to know that this is what they must do, or how to do it.

STIMULUS	ORGANISM	RESPONSE
= where the =	= =	= the fish =
= fish was =	= salmon =	= returns to =
= hatched =	>= >=	>= the breeding >=
= =	= =	= ground, stops, =
= =	= =	= breeds, dies =

A human example would be the knee jerk reflex. When you go to the doctor for a general physical examination, you have to sit on the examining table, cross your legs, and then the doctor will use a little rubber hammer to strike just below your knee, and then observe the knee jerking in response. Your mother did not have to tell you to do that; your knee was pre-programmed to respond in that way.

STIMULUS	ORGANISM	RESPONSE
= =	= =	= =
= rubber =	= patient =	= jerks =
= hammer =	>= >=	>= knee >=
= =	= =	= =
= =	= =	= =

Classical conditioning is one way that the organism can learn a new stimulus-response relationship by building on an old one. **Classical conditioning requires the paired presentation of two stimuli.** The first stimulus was originally neutral (at least with respect to the response). The second stimulus already has a reflex relationship with the response. After enough paired trials of presentation (first stimulus followed by second stimulus) a new reflex will be acquired. At that point, the formerly neutral stimulus becomes a conditioned stimulus capable of eliciting the same response on its own, even if it is not always followed by the second stimulus.

Ivan **Pavlov** was one of the first researchers in classical conditioning. Most of his research subjects were mongrel dogs. He liked to work with the individual animals over a period of years, getting to know their peculiarities. As a skilled surgeon, he was able to install a glass window on a dog's stomach, so that the digestive processes could be directly observed. In 1904 he won the Nobel Prize for his work in the physiology of digestion.

STIMULUS	ORGANISM	RESPONSE
=	=	=
= food	=	= digestive
= placed	=====>= dog	=====>= processes
= in dog's	=	= begin
= mouth	=	=
=====	=====	=====

One day as he was preparing an animal for observation, Pavlov noticed that the digestive processes did not start when the dog actually received the food in its mouth, but as soon as the dog could tell that the food was coming. After the dog had been through the procedure a few times, Pavlov noted that the dog's digestive juices began to flow at the first indication of the coming food: the distinctive sound of the shoes of the attendant who brought the food.

STIMULUS	ORGANISM	RESPONSE
= familiar	=	=
= footsteps	=	= digestive
= of the	=====>= dog	=====>= processes
= attendant	=	= begin
= who feeds dog	=	=
=====	=====	=====

It is a natural reflex for a dog to salivate at the taste of the food, but there is no inherited reason for a dog to salivate at the sound of someone's footsteps. That sound was originally a neutral stimulus. Note that the dog did not salivate to the sound of the footsteps until it had learned to associate that sound with the subsequent stimulus of the food. The dog's experience with the footsteps being followed by the food was a new learning experience. When the footsteps began to elicit

the salivation on their own, we could say that the sound was no longer neutral, but had become a conditioned stimulus.

(neutral stimulus)	(unconditioned stimulus)	(organism) [PASSIVE]	(response) (elicited)
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FOOTSTEPS -----> FOOD -----> DOG -----> DIGESTION

after acquisition of new reflex

(conditioned stimulus)		(organism) [PASSIVE]	(response) (elicited)
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FOOTSTEPS -----> DOG -----> DIGESTION

Pavlov was a master researcher when it came to the precision of his measurements and thorough control of extraneous variables. He constructed a special observation cage for the dog: it was soundproof and had a one-way mirror, so Pavlov could observe the dog, but the dog could not see or hear the approach of an attendant with food. The dog was placed in a special harness to reduce extraneous movements. Pavlov surgically implanted a tube into the dog's salivary gland. The tube carried the saliva into a collection cup where the flow was measured by a drum rotating against an inked needle. Pavlov decided to try a different sound this time for his neutral stimulus, a bell.

The bell would be rung inside of the cage for the dog to hear, then the dog would get food in the form of meat powder. Pavlov observed the charted flow of the saliva, noting that after just a few trials (paired associations) of these two stimuli, the dog had acquired a new reflex. At that point, the bell could be called a conditioned stimulus, since the dog began to salivate as soon as the bell sounded, even before the food arrived.

(neutral stimulus)	(unconditioned stimulus)	(organism) [PASSIVE]	(response) (elicited)
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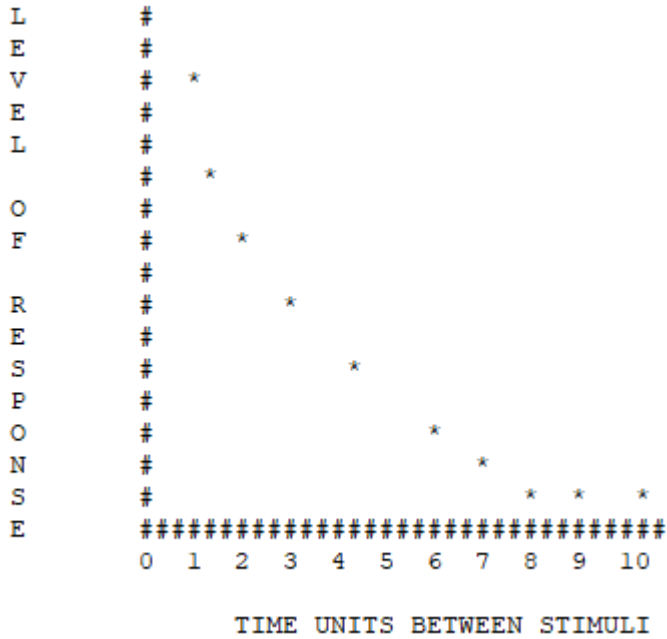
BELL -----> FOOD -----> DOG -----> SALIVATION

after acquisition of new reflex

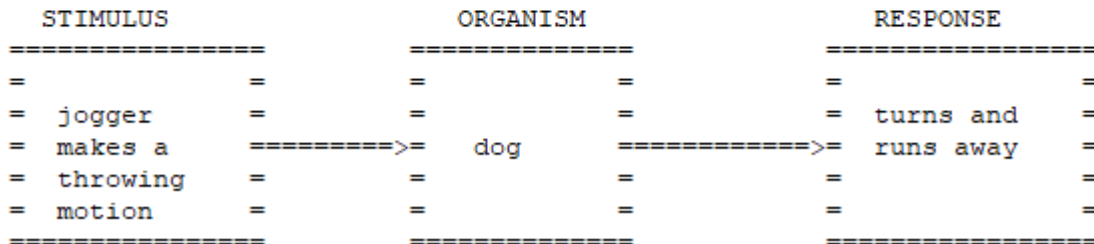
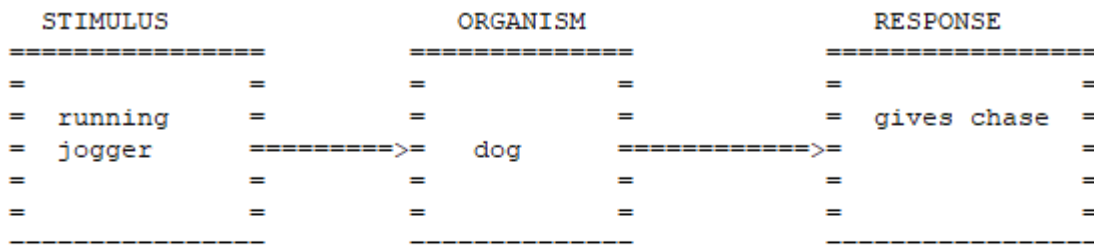
(conditioned stimulus)		(organism) [PASSIVE]	(response) (elicited)
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BELL -----> DOG -----> SALIVATION

Pavlov experimented with several variables, and consistently found that timing was most important: the less delay between the neutral stimulus (the bell) and the unconditioned stimulus (the food), the sooner and stronger the new reflex acquired. If he waited too long to present the food, the dog never associated the bell with the food.



Case Study: The subject is now a different dog, a street dog in Mexico. He sees a jogger, and decides to give chase. The jogger notices the approaching, growling dog, and stops, and brings his right hand back as if to throw a rock. The dog turns and runs in the opposite direction.



Classical condition might give us a useful insight on why the dog so drastically changed its behavior. Perhaps that dog has had some bad experiences with people throwing rocks.

(neutral stimulus)	(unconditioned stimulus)	(organism) [PASSIVE]	(response) (elicited)
THROWING MOTION	-----> BEING HIT BY A ROCK	-----> DOG	-----> PAIN, FEAR, RUNS AWAY

after acquisition of new reflex

(conditioned stimulus)	(organism) [PASSIVE]	(response) (elicited)
THROWING MOTION	-----> DOG	-----> FEAR, RUNS AWAY

About the time that Pavlov was doing his research on salivating dogs, young John **Watson** was a graduate student at the University of Chicago. Most of his professors had studied or taught with Wundt or James, and emphasized introspection. Watson worked his way through graduate school doing various jobs, such as working on the other side of campus, in the medical school, cleaning out the animal cages in the laboratories. This experience led Watson to the conclusion that if psychology was to achieve the status of a respected science, it also had to embrace the precise measurement and control found in research on laboratory animals. Most of Watson's own later research was done with rats, but his most famous subject was a human baby, identified as Little Albert.

Watson was interested in studying fear in babies. Babies fear loud noises, so Watson decided to use that as his unconditioned stimulus to elicit the response of fear. For a neutral stimulus, Watson could have chosen just about anything, but he selected a live, white mouse. This leads many students to misinterpret the components of Watson's research. The mouse was not the subject; the human baby was the subject. The mouse's role was that of a stimulus. Watson could just as easily have used a toy mouse or any other object to serve as the initially neutral stimulus.

Watson hid behind a curtain with a metal bar in one hand and a hammer in the other. His assistant led the baby boy into the room. When the baby was calm, she let the mouse out. When the baby noticed the mouse, she signaled Watson who then struck the bar with the hammer, making a very loud sound. The baby was frightened and began to cry. The next day, the procedure was to be repeated. Watson took up his place behind the curtain, ready to strike the bar again when he was signaled. His assistant brought the baby into the room, and when he was calm, she released the mouse again. But this time, even before Watson could strike the iron bar with the hammer, the baby began to cry. The white mouse was no longer a neutral stimulus for the baby, but something

frightening on its own. A new reflex had been acquired with just one paired association.

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

MOUSE -----> LOUD NOISE ----> BABY -----> FEAR

after acquisition of new reflex

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

MOUSE -----> BABY -----> FEAR

Later in life, Watson gave up academic psychology and accepted a position with an advertising agency. His strategy was similar to the logic of classical conditioning: pair the name of the product (perhaps a neutral stimulus) with another stimulus (one that the consumer already responds to, such as an attractive spokesperson).

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

PRODUCT LOGO --> SPORTS STAR ---> VIEWER ---> INTEREST

after acquisition of new reflex

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

PRODUCT LOGO -----> VIEWER ---> INTEREST

Higher order learning refers to the process of using previously conditioned stimuli to condition new stimuli. Once a stimulus has become conditioned, that stimulus can now serve in the role of unconditioned stimulus for the acquisition of a new reflex. For example, if a rattle was shaken just before the white mouse was presented, Little Albert could have been conditioned to fear the noise of the rattle.

(neutral	(conditioned)	(organism)	(response)
stimulus)	stimulus)	[PASSIVE]	(elicited)

RATTLE -----> MOUSE -----> BABY -----> FEAR

after acquisition of new reflex

(conditioned	(organism)	(response)
stimulus)	[PASSIVE]	(elicited)

RATTLE -----> BABY -----> FEAR

Watson was an advocate of the philosophical position known as **determinism**. He doubted that people really had free will to choose their own behaviors. Whether he was thinking of a lab rat, a baby, or a potential consumer, Watson conceived of a passive organism whose behavior was completely determined by the pattern of stimuli coming in from the environment. He boasted that he could make any healthy newborn into a beggar, thief, or saint, just by varying the conditioning.

Stimulus **generalization** is the tendency of similar stimuli to elicit similar responses. If you were going to adopt one of the dogs from Pavlov's laboratory, you might have the problem of the dog salivating every time your doorbell rang. Someone conditioned like Little Albert might develop stimulus generalization in terms of fearing other white, furry objects: perhaps a toy stuffed bunny, a live white kitten, and even a man with a Santa Claus beard. Stimulus **discrimination** is where the organism learns to respond to a particular stimulus, and not to other stimuli that are similar.

Extinction is a gradual loss of conditioning. Before you adopted one of Pavlov's dogs, you might insist that it be deconditioned. In classical conditioning, this is usually accomplished by massed trials of presenting the conditioned stimulus alone, without being followed by the unconditioned stimulus. With Pavlov's dogs, this would mean ringing the bell without any presentation of food, many times over the day. The flow of saliva after the bell will diminish as the dog tires of salivating without the food.

Recovery of a reflex refers to reconditioning an organism. For example, suppose you adopted two dogs, one from the pound (a dog who had never been conditioned to salivate at the sound of a bell), and a dog from Pavlov's lab (who had been conditioned, then extinguished with massed trials). Now suppose that you want to condition both dogs to salivate at the sound of the bell, so you ring the bell and follow it with the food. Both dogs can be conditioned to salivate at the sound of the bell, but it will be the dog from the Pavlov lab that will be quicker to condition, as it is merely relearning an old habit.

Classical conditioning pairs two stimuli SS to a passive organism

CLASSICAL
P ASSIVE

The fear response is difficult to extinguish. Massed presentation of the conditioned stimulus might be effective over time, but the subject will find it terrifying. As we shall see in chapter 11, the favored approach is one of systematic **desensitization**: slowly exposing the relaxed organism to a series of approximations of the feared stimulus. This technique for undoing classically conditioned feared stimuli was not developed by Watson, but only years later by Mary Cover **Jones**.

One of the great ethical concerns raised by Watson's work was the well-being of his human subject. We do not know if Little Albert continued these **phobic** (intense, irrational fear) responses throughout his adult life. We do know that Watson did not report any deconditioning work on his subject.

QUESTION #6.2: What is operant conditioning?

Operant conditioning uses reinforcement. Reinforcement is a stimulus that the organism gets (or gets rid of) after the response has been given. After Watson, many behaviorist psychologists did research on what was called effect-based, **instrumental**, or operant conditioning. The key difference with the classical conditioning of Pavlov and Watson, and this newer approach was that operant conditioning used an active organism that emitted the response, and then the stimulus was presented to the animal. You have performed some operant conditioning if you taught your pet to do a trick.

(organism) (response) (reinforcement)
(active) (emitted)

PET -----> DOES TRICK -----> FOOD TREAT

Behaviorist B.F. **Skinner** was one of the major researchers with operant conditioning. He developed specialized cages known as Skinner boxes. These cages made it very easy to study operant conditioning. A Skinner box for a pigeon would have a dispenser that could give the pigeon one food pellet at a time, and also a mechanism to record the pigeon's pecking (the response).

(organism)	(response)	(reinforcement)
(active)	(emitted)	

PIGEON -----> PECK TARGET -----> FOOD PELLET

A Skinner box for a rat would also have a dispenser that could give one food pellet at a time, and a mechanism to record the pressing of a bar by the rat (the response).

(organism)	(response)	(reinforcement)
(active)	(emitted)	

RAT -----> PRESS BAR -----> FOOD PELLET

Skinner was able to identify several factors influencing the organism's learning of a reflex. Timing was important: the longer the delay between the organism's response and the provision of the reinforcement, the harder it was to learn the connection between the two.

QUESTION #6.3: What are different types of reinforcement?

Reinforcement is the stimulus that the organism receives (or gets rid of) right after emitting a response. In other words, reinforcement is what happens to the organism because of its response.

Reinforcers can be either primary or secondary. **Primary reinforcers are unlearned:** the organism naturally appreciates them. The example given above, food, is a primary reinforcer. The avoidance of pain would be another. In one sense, primary reinforcers in operant conditioning are similar to the unconditioned stimulus used in classical conditioning. Food presented before the response would be an unconditioned stimulus in classical conditioning. Food presented after the response would be primary reinforcement in operant conditioning.

Secondary reinforcers are those that the organism has had to learn to appreciate. Experience teaches us the value of money, good grades, social approval, and the avoidance of embarrassment. In a sense, secondary reinforcers in operant conditioning are like conditioned stimuli in classical conditioning: the organism has learned to respond to them. All conditioning involves the learning of a new response, but only those cases in which the organism has learned to appreciate the value of the reinforcer can be called secondary reinforcement.

(organism) (response) (reinforcement)
(active) (emitted) (secondary positive)

STUDENT -----> STUDIES HARD ----> GETS GOOD GRADES

(organism) (response) (reinforcement)
(active) (emitted) (secondary positive)

ATHLETE -----> PRACTICES HARD ---> WINS FIRST PLACE

(organism) (response) (reinforcement)
(active) (emitted) (secondary positive)

WORKER -----> WORKS OVERTIME ---> GETS LARGE PAYCHECK

Reinforcers can also be classified as [positive](#) or negative. A **positive reinforcer is a reward**, something that is provided to the organism, especially something it wants and appreciates. Food and pleasure would be primary positive reinforcers. Money, good grades, and social approval would be secondary positive reinforcers, because a person must learn to appreciate the value of those things.

Extinction with positive reinforcement is easy: just remove the reinforcer. If we want to get the pigeon to stop pecking, or the rat to stop pressing the bar, we just turn off the food dispensing mechanism. Human reinforcement is more complicated, especially where some secondary reinforcement may also be involved.

Case Study: Mr. H had a newspaper route when he was just twelve years old. He was able to save up enough money for his first car at age sixteen. He worked his way through college selling and installing chain link fence. After college he became a life insurance agent. He worked very hard and was outstanding in his sales. He then had the capital to purchase other businesses: oil development, cattle, real estate. Now in his 70s he keeps on working, even though he has no need for more money. Perhaps he has been conditioned by secondary reinforcers such as social approval and status. On the other hand, the determinists may be wrong, and people might actually have free will. Mr. H may keep on with his business dealings because he enjoys the excitement of the business world, and wants to help his customers, employees, and community with his business acumen.

Like Watson, Skinner was a major force on **Behaviorism**, and an advocate of the philosophical doctrine of determinism. Skinner considered the concept of free will to be a mere delusion. He thought that a perfect society could be constructed if we just systematically controlled the positive reinforcers so that every individual would be conditioned to do good, pro-social behaviors. Before he went to graduate school to study psychology, Skinner had spent a year in Greenwich Village trying to make it as a writer. After he had earned his reputation as a serious

scientist, Skinner returned to his love of fiction writing, describing a utopian society, *Walden II*, which employed his theories of positive reinforcement. Unlike Huxley's *Brave New World* or Orwell's *1984*, there is no obvious fatal flaw in Skinner's perfect system. People in *Walden II* act in a kind, cooperative and conscientious manner because that is how they have been conditioned to act.

The power of positive reinforcement is not limited to normal adults, rats and pigeons. In mental hospitals, developmentally disabled and schizophrenic patients have their behavior altered by the **behavioral modification** of positive reinforcement. These patients can be trained to turn in their dirty laundry, take their medication, and show up for group therapy by getting rewards such as candy, cigarettes, or various privileges.

(organism)	(response)	(reinforcement)
(active)	(emitted)	(secondary positive)

PATIENT -----> TURNS IN LAUNDRY ----> GETS CANDY

Even invertebrates lacking a real central nervous system (e.g., planarian worms) can be conditioned operantly to make certain motions if reinforced by food.

Unfortunately for Skinner's theory, positive reinforcement does not always lead to an increase in the reinforced behavior. Human motivation is more complex. Skinner assumed that people were solely motivated by **extrinsic** factors (e.g., I get some candy), while humanistic psychologists have pointed out a number of **intrinsic** motivators (e.g., I feel like I have achieved something). Sometimes if parents give too much extrinsic reinforcement (e.g., money, praise) for when the child does something she already enjoys doing (e.g., reading, athletics) this results in an **overjustification**, in which the child's level of intrinsic motivation decreases, and then the actual levels of response also decrease.

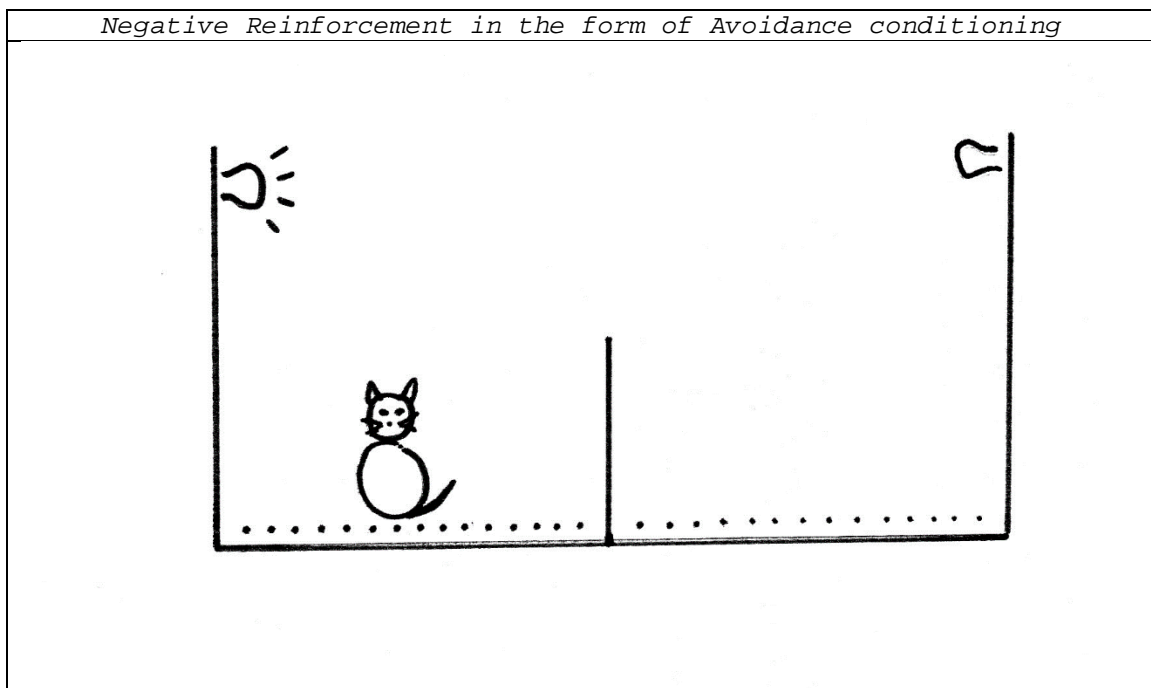
Negative reinforcement involves the prevention or removal of an aversive stimulus. An aversive stimulus is something that the organism does not like (and serves as a punishment). So, negative reinforcement is the opposite of punishment: **punishment** provides an aversive stimulus, while **negative reinforcement** would prevent or remove that aversive stimulus. (Skinner preferred positive reinforcement.)

Imagine that a cat (or less lovable creature) has been placed into a special cage that has a small fence down the middle, separating the two sides of the cage. The cat cannot jump out of the cage, but he can jump over the fence onto the other side of the cage. Each side of the cage has a separate electrifiable grid capable of giving a mild, but unpleasant shock to any organism standing on the grid. The cage also has two little light bulbs in the roof. The light bulb on the left comes on, but this is like a neutral stimulus for the cat, so there is no immediate response. A few seconds later, the grid on the left side of the cage is electrified, presenting the organism with an aversive

stimulus. The cat now responds by trying to get away from the shock, and jumps the fence, finding that the grid on the right side of the cage is off. The cat has escaped from the aversive stimulus. A few minutes later, the right light comes on, and a few seconds later, the right side of the cage becomes electrified. The cat jumps over the fence again to escape the new shock, and lands back over on the left side of the cage, finding that grid has now been turned off. In a short time, the cat will figure out that the lights are a warning of a forthcoming shock, and if the cat jumps fast enough, it can completely avoid being shocked.

(organism)	(aversive stimulus)	(escape response)	(termination of aversive stimulus)
cat ----->	painful electric shock	-----> jumps fence	-----> stops feeling shock

(organism)	(warning stimulus)	(escape response)	(prevention of aversive stimulus)
cat ----->	light	-----> jumps fence	-----> never gets shocked



Case Study: Let's revisit a previous example: the street dog who was chasing a jogger, but then ran the other way when the jogger pretended to throw a rock. Negative reinforcement could also explain the dog's actions.

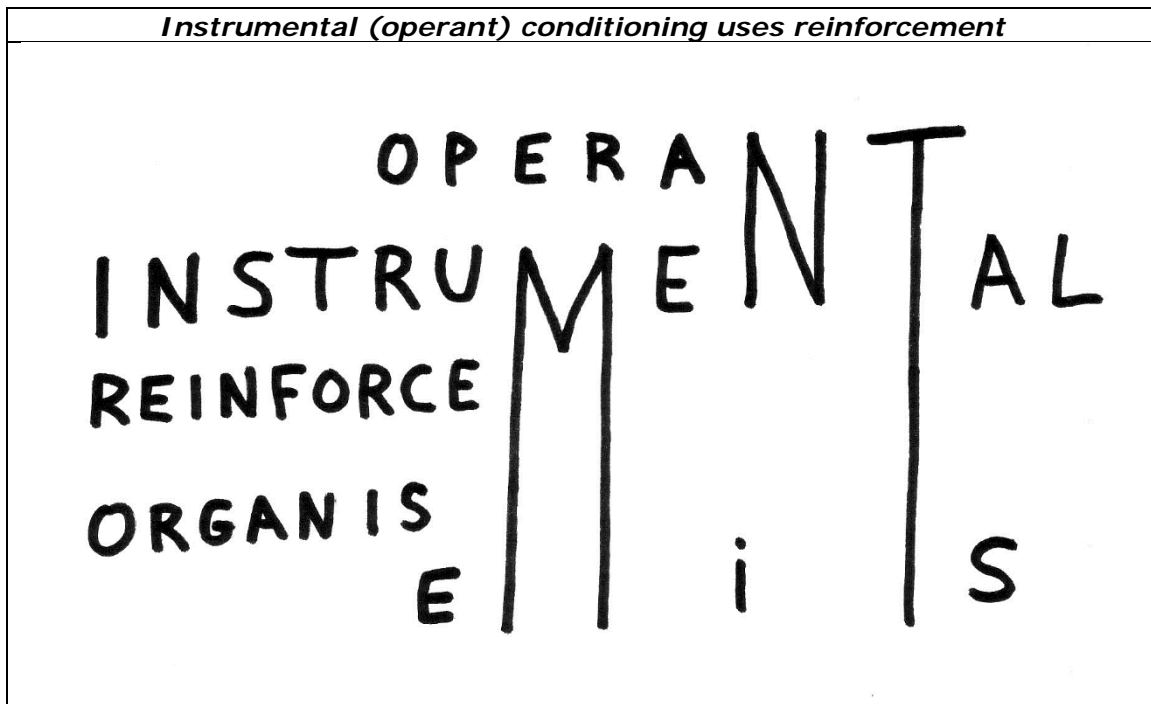
(organism)	(aversive stimulus)	(escape response)	(termination of aversive stimulus)
dog ----->	getting hit by a rock	turns and runs away	does not get hit by more rocks

(organism)	(warning stimulus)	(escape response)	(prevention of aversive stimulus)
dog ----->	person making a throwing motion	turns and runs away	does not get hit by any rocks

Negative reinforcement can explain about a dozen activities you might engage in each morning before you leave the house. You get on the exercise machine, even though it is boring, in order to get the negative reinforcement of avoiding weight gain. You swallow a large, bitter vitamin pill in order to get the negative reinforcement of reducing your chances of getting ill. You bathe, groom, and dress yourself, to get the negative reinforcement of avoiding embarrassment. As you leave the house, you set the alarm and lock the doors, in order to get the negative reinforcement of not having a burglar come into the house while you are gone.

Forms of reinforcement		
	Positive (provide a reward)	Negative (remove an aversive S)
Primary	Food Pleasure	Take away Pain
Secondary	Money Points Praise	Take away Embarrassment

Negatively reinforced behavior may be harder to extinguish. Suppose we turned off the electrified grids in the cage, but still had the light bulbs come on every once in a while. The cat would not know that the lights will no longer be followed by shocks, and so will continue to jump. The fact that he is not shocked after the jump, is merely more reinforcement for his jumping behavior. Suppose that your local police became extremely effective in stopping burglaries in your neighborhood, you might not decide to get rid of the alarm, or stop locking your doors. Indeed, you might conclude that the reason you have not been burglarized is because of the cautious responses you have taken. Even when the aversive stimulus is provided after the response, this does not necessarily extinguish the reflex. If your house were burglarized despite your alarm and lock, you would probably conclude that you needed a quicker responding alarm company and bigger locks.



QUESTION #6.4: How can reinforcement be scheduled?

At the beginning of operant conditioning, it may be necessary to reinforce successive approximations of the end response. Suppose that we want to condition a pigeon to peck at a target in its cage. We might have to take over manual control of the food pellet dispenser. We might send the first pellet down the chute when the pigeon first faces the wall containing the target. We might give another food pellet when the pigeon starts to walk toward the wall. We will wait until the pigeon pecks somewhere on the wall before the next pellet is dispensed. Then we will require the pigeon to hit one of the rings of the target before giving another food pellet. Then we can progressively reduce the number

of rings in the target until we only reinforce a direct hit on the bull's eye center of the target.

Once an organism has been operantly conditioned, reinforcement does not have to be maintained on a continuous schedule. It can be used **intermittently**, so that only some of the responses are reinforced, while the majority of the responses go unreinforced.

Case Study: Mr. L watches a lot of television. He knows exactly what he likes: action-filled police dramas and action-filled sporting events. Even when he is watching his favorite programs, or the World Series, if a commercial comes on, or the action gets a little slow, he gets out his channel flipper. Each time he flips to the next channel, that constitutes a response. If such flipping results in his seeing something more interesting, he has been positively reinforced. But most of the time he flips to the next channel, he sees something just as boring as what he flipped away from: another commercial, talking head newscasters, cartoons, women's talk shows, soap operas. He may not be reinforced that often, but he is reinforced often enough to keep on flipping channels. People and animals keep on doing things even when they are reinforced only occasionally.

(organism)	(response)	(reinforcement)
(active)	(emitted)	(secondary positive)

TV VIEWER -----> FLIPS CHANNEL -----> GETS BETTER PROGRAM

Intermittent reinforcement can be set up on schedules that are determined by the ratio of the responses, or by the interval of the responses. **Ratio schedules** make the amount of reinforcement proportionate to the number of responses, such that if the organism emits more responses, he will end up getting more reinforcement over the long run. Time **interval schedules** of reinforcement mean that in any given time period, the organism will be reinforced only once, regardless of how many additional responses might be made.

Fixed ratio reinforcement could be set at any ratio, say, five to one. The pigeon might be required to make five pecks at the target in order to get one food pellet. The first four responses made by the pigeon will be ignored, but on the fifth response, a food pellet will be delivered. This will get more responses out of the pigeon than if it were reinforced on a continuous one-to-one ratio.

There are many human examples of fixed ratio reinforcement, especially in the world of work. Piecework is the practice of varying the worker's pay according to how much the worker does. In agricultural harvesting, fruit pickers are usually paid by the box, and so they pick fast in order to get more money. On some construction projects, workers are paid according to how many loads of bricks are laid, or how many houses are framed. In the clothing industry, some workers are paid by how many pieces of clothing are sewn.

<i>(organism)</i>	<i>(response)</i>	<i>(reinforcement)</i>
<i>(active)</i>	<i>(emitted)</i>	<i>(secondary positive)</i>

FRUIT PICKER ---> PICKS FAST -----> GETS MORE MONEY

Variable ratio reinforcement means that the proportion of reinforcers to responses might have a certain average, say five to one, but there is no guarantee that each fifth response will be reinforced. One of the best examples of variable ratio reinforcement is gambling. Imagine a slot machine that takes quarters and pays off dollar jackpots. The machine has been set to a five to one ratio (on the average, taking in five quarters for every dollar paid out, which would return a 25 percent profit to the house). You decide to try your luck, and put in a quarter, hoping to get a dollar back, but nothing happens after you pull the handle. You put in a second quarter, thinking that you can still double your money, pull the handle, but nothing happens. You put in your third quarter, still thinking that you could be money ahead, pull the handle, but nothing happens. You put in your fourth quarter, thinking that you can break even, pull the handle, but nothing happens. You put in your fifth quarter, starting to feel like a sucker because you remember that it is a five to one ratio, and so far you have not beaten those odds. You pull the handle, and expect your jackpot, but you just might be disappointed again. If the machine were set up with fixed ratio reinforcement, you would be guaranteed of getting your jackpot after five pulls, but this is variable ratio: on the average it takes five pulls. That means that some people may win in fewer, but others will be reinforced less often. That is why they call it gambling, and that is why gamblers lose over the long run.

<i>(organism)</i>	<i>(response)</i>	<i>(reinforcement)</i>
<i>(active)</i>	<i>(emitted)</i>	<i>(secondary positive)</i>

GAMBLER -----> PLACES A BET -----> WINS SOME MONEY

Variable ratio reinforcement schedules are also faced by authors who try to get their books (or articles or poems or screen plays) published. Imagine that you write a novel, then send it to a book publisher. It is rejected by the first publisher, so you send it to another, and it is rejected there too. Finally, you try a third publisher, and this time it is accepted for publication. You receive a royalty contract, a large monetary advance, and invitations from talk shows. There was no guarantee that the third publisher would accept the book. You might have had to send it to five, or ten, or a hundred, and even then realize that most books are not published. But occasionally some new authors get through, and that is enough reinforcement to keep them writing and submitted the books to publishers.

<i>(organism)</i>	<i>(response)</i>	<i>(reinforcement)</i>
<i>(active)</i>	<i>(emitted)</i>	<i>(secondary positive)</i>

AUTHOR -----> SUBMITS BOOK -----> GETS BOOK CONTRACT

Yet another example comes from the world of commission sales. The organism is a car salesman. The response he is supposed to make is to greet a potential customer, go on a test drive, and write up a deal that he then takes to management. If a sale can be negotiated and financed, the salesman will be paid a commission (a positive reinforcer). An old rule of thumb in auto sales is that you have to present yourself to twenty customers for every sale you get. The times around Christmas might be a little slower, and then some times (during a factory rebate) might be a little better, but the salesman never knows if the next customer will be one who ends up saying "just looking" or the one who drives out with a new car.

<i>(organism)</i>	<i>(response)</i>	<i>(reinforcement)</i>
<i>(active)</i>	<i>(emitted)</i>	<i>(secondary positive)</i>

SALESMAN -----> PRESENTATION -----> GETS SALES COMMISSION

Fixed interval schedules mean that there would be a rigid time period (say an hour) during which only one response will be reinforced. Imagine that the pigeon in the Skinner box is getting too fat. Putting him on ratio reinforcement would give him more exercise, but putting him on interval reinforcement would be a diet. We will give the pigeon a maximum of one food pellet per hour. The very first time it pecks the target during the hour, one food pellet is dispensed. No additional pecks will be reinforced until the next time period commences. The closest human example of fixed interval reinforcement would be hourly pay. Regardless of how much work the person does in that hour, the pay for showing up will be the same.

Variable interval reinforcement means that the time period may fluctuate, although it may average a certain length of time. Fishing is one example of variable interval reinforcement. Suppose you go up to the lake each Saturday morning, and spend about four hours on the water fishing. You catch an average of four fish, so that means you are getting about one fish per hour. However, this is a variable schedule so the reinforcement is not guaranteed: you cannot look at your watch and say "It has been 58 minutes, so I better get ready for my first fish." On a good day, the interval between catches might be short. Indeed, you might catch all four fish in your first hour. On a bad day, you might end up with no fish at all.

<i>(organism)</i>	<i>(response)</i>	<i>(reinforcement)</i>
<i>(active)</i>	<i>(emitted)</i>	<i>(secondary positive)</i>

FISHERMAN -----> FISHES 4 HOURS ----> CATCHES SOME FISH

Another example of variable interval reinforcement would be calling up a friend on the phone and trying to get through. You know that your friend is usually on the phone for about ten minutes before she ends the conversation and a new call can get through to her. If you call her and get a busy signal, you might hang up and call again in a minute and be lucky to catch her. Or sometimes you can try several calls during an hour and keep on getting a busy signal because she is having unusually long and frequent conversations on the phone.

(organism) (response) (reinforcement)
 (active) (emitted) (secondary positive)

CALLER -----> PLACES PHONECALL -> CALL GETS THROUGH

A beggar on a busy street works under a variable interval schedule. His begging behavior may be to look sad, draw attention to his disability, say religious things, offer to work for money, sing or play a musical instrument, or be accompanied by an animal. He may average a "donation" every ten minutes, but he cannot predict when the next one is coming: thirty seconds? three hours?

(organism) (response) (reinforcement)
 (active) (emitted) (secondary positive)

BEGGAR -----> PRESENTATION -----> GETS DONATIONS

<i>Examples of Reinforcement Schedules</i>		
	FIXED	VARIABLE
Ratio (determined by number of responses)	Piecework	Gambling Commission sales
Interval (determined by time period)	Hourly wage	Fishing Getting through on the phone

Advantages of Reinforcement Schedules		
	FIXED	VARIABLE
Ratio (determined by number of responses)	High rates of response	High rates of response Low rates of Extinction
Interval (determined by time period)	Lower fatigue and stress	Low rates of Extinction

These schedules offer different advantages. In general, ratio schedules get higher rates of response than do interval schedules. Variable schedules tend to resist the extinction produced by non-reinforcement because variable schedules are the least predictable. As any gambler, author, salesman, or fisherman can tell you, there will be some long dry periods when "the luck runs cold." Eventually, the luck will turn around and some money will be made (but in the long run, most gamblers lose more than they win). Perhaps the greatest advantage of fixed hourly pay is that it removes the stress of unpredictable compensation, and allows the worker to focus on quality. Perhaps the major reason why so many careers involve the fixed interval of hourly wage or monthly salary is that it is difficult to measure and reinforce many work-related responses.

Schedules of reinforcement					
<i>Schedule</i>		<i>Examples</i>	<i>High rates of response</i>	<i>Resistance to extinction</i>	<i>Levels of stress and fatigue</i>
Fixed	Ratio	Piecework	Excellent	Fair	Fair
Fixed	Interval	Hourly wage	Fair	Fair	Good
Variable	Ratio	Gambling	Excellent	Excellent	Poor
Variable	Interval	Fishing	Fair	Excellent	Fair

Indeed, we must always be careful when using positive reinforcement that we end up getting the behavior that we really wanted. Some companies have given up piecework when they found that the workers quickly assembled shoddy units. Some retailers have found that commission sales lead to high pressure tactics that drives away the customers and gives the firm a bad reputation. One rural district in India decided to try to control the cobra population by offer a bounty to villagers for each snake, dead or alive, brought in.

Intended Result

(organism) (response) (reinforcement)
 (active) (emitted) (secondary positive)

VILLAGERS -----> CATCH SNAKES -----> TURN THEM IN FOR BOUNTY

At first the program seemed quite successful. Hundreds of snakes were turned in. The officials were certain that a large reduction in the snake population would result. The next year even more snakes were turned in, and the number increased geometrically the following year, and the officials wondered how they would get enough to pay all these bounties, and they were amazed that there had been so many snakes to begin with. Then one of the hunters admitted that it was a lot easier to raise the snakes than to catch them.

Actual Result

(organism) (response) (reinforcement)
 (active) (emitted) (secondary positive)

VILLAGERS -----> RAISE SNAKES -----> TURN THEM IN FOR BOUNTY

Here is a summary of the main differences between classical and operant conditioning.

	CLASSICAL	OPERANT
<i>Major figures</i>	Watson, Pavlov	Skinner
<i>Subjects</i>	Dogs (Pavlov) Baby (Watson)	Rats, Pigeons
<i>Organism is</i>	Passively anticipating a stimulus	Actively emitting a response
<i>Stimulus is</i>	Paired before a response (NS / UCS)	Presented after the response
<i>Role of stimulus</i>	Elicits the Response	Reinforces the response
<i>Generalization</i>	To similar Stimuli	To similar responses
<i>Extinction</i>	Due to presenting CS without UCS	Due to Non-reinforcement of response
<i>Resistance to Extinction is Greatest when</i>	UCS was intense (e.g., Little Albert)	The schedule is Variable (e.g., gambling)

QUESTION #6.5: What is punishment?

Punishment is the provision of an aversive stimulus, presenting the organism with something that it does not want to happen. Punishment is not the same as negative reinforcement (which prevents or removes an aversive stimulus).

Punishment is employed in order to reduce a specific response by the organism. Punishment can be **effective if it is sufficiently intense, is consistently applied, and immediately follows the response**. The longer the time lag between responses and punishment, the less likely the organism will connect the two. Telling a toddler "wait until your father gets home" is a bad discipline strategy for several reasons. The delay breaks the connection between the punishment and the bad act which the mother or baby sitter may wish to suppress. Assigning discipline exclusively to the father (or any one adult) may cause the child to associate punishment with that individual rather than her own behavior.

Another limitation to certain forms of punishment is that termination may constitute a negative reinforcement for whatever the organism was doing just prior to termination. A five-year-old boy was placed in a chair facing the corner for a timeout by his sitter. She had intended to leave him there for about five minutes, but she got distracted making lunch. After about seven minutes, the boy said "Is it time yet?" The sitter looked at her watch and agreed that he could go back and play. On the next occasion for a time out, the boy started asking "Is it time yet?" just a couple of minutes into his time out. He had been negatively reinforced for his questioning.

(organism)	(response)	(reinforcement)
(active)	(emitted)	(secondary negative)

BOY -----> "Is it time yet?"----> TIME OUT PERIOD ENDS

Even when punishment is effective in suppressing a response, it does not necessarily weaken the underlying habit. "When the cat is away, the mice will play." If a child has associated the risk of punishment with the presence and vigilance of a parent, she might conclude that she just has to be more careful not to get caught.

One alternative to punishment is distraction. Small children may throw a tantrum because they want something right now, and have little capacity for self-restraint or delayed gratification. Imagine this situation in the supermarket. A three-year-old boy in a shopping cart sees a cereal carton with a toy he has seen advertised on television. He asks for it, but the mother says no, so he responds with a tantrum.

STIMULUS	ORGANISM	RESPONSE
= cereal box = with toy	= child	= asks for box

STIMULUS	ORGANISM	RESPONSE
= mother says = No!	= child	= tantrum

Many "old fashioned" parents think that quick punishment is the best tactic at this point.

STIMULUS	ORGANISM	RESPONSE
= swat to the = rear	= child	= tantrum is = suppressed

This might work, but here are some other possible outcomes.

STIMULUS	ORGANISM	RESPONSE
= swat to the = rear	= child	= tantrum is = intensified = by pain and = frustration

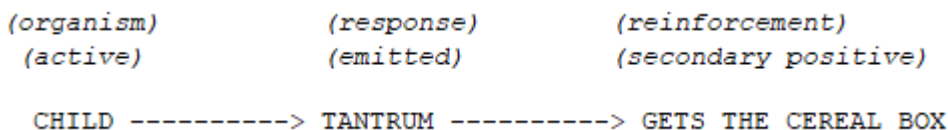
STIMULUS	ORGANISM	RESPONSE
=	=	=
=	=	=
= swat to the rear	= child	= fear of the store and cereal box
=	=	=
=	=	=

STIMULUS	ORGANISM	RESPONSE
=	=	=
= observes parent hitting child	= store official	= informs law enforcement
=	=	=
=	=	=

One alternative especially appropriate for subjects with limited attention spans (e.g., young children and dementia patients) is distraction. The connection between the initial stimulus (the cereal box) and the child's interest will be short lived if one stimulus can be replaced by another. One mother distracted her little girl, a young fan of the Simpsons cartoon series, by saying "Oh, look, there is Krusty the Clown, let's try to catch him." When the little girl looked around and said "Where is Krusty?" the mother responded, "Well, you know Krusty does not like the sound of children crying."

STIMULUS	ORGANISM	RESPONSE
=	=	=
= Krusty the Clown	= child	= loss of interest in cereal box
=	=	=
=	=	=

The worst thing that a parent could do in the above situation would be to give the child the cereal box after a tantrum has already emerged. That merely provides positive reinforcement for the tantrum. Many parents rationalize their giving in, thinking, "Well, just occasionally" but that only serves to schedule the reinforcement on a variable schedule, which will make it most difficult to extinguish later on.



Here is a summary of the differences between positive and negative reinforcement, punishment, and non-reinforcement.

<i>Different forms of learning</i>		
	PROVIDED	REMOVED
REWARD	Positive reinforcement <i>Increases R</i>	Non-reinforcement Extinguishes <i>Decreases R</i>
AVERSIVE STIMULUS	Punishment Suppresses <i>Decreases R</i>	Negative Reinforcement <i>Increases R</i>

So, here is a guide as to what to use.

<i>In order to</i>	<i>Use</i>	<i>Which means</i>
Increase behavior	Positive reinforcement	Give reward After behavior
Increase behavior	Negative reinforcement	Withdraw aversive S After behavior
Decrease behavior (suppress habit)	Punishment	Give aversive S After behavior
Decrease behavior (weaken habit)	Extinction via Non-reinforcement	Give no reward After behavior

QUESTION #6.6: What are other forms of learning?

Modeling is where the subject observes another organism doing something, and then imitates that behavior. This is also known as **vicarious** or observational or imitative learning. The idea of "monkey see, monkey do" has been around a long time, but Albert **Bandura** has been one of the pioneer researchers in this area.

Several factors influence whether a subject will choose to model his own behavior on that observed in another person. One is whether the subject observes the other organism being reinforced (or punished) for the behavior. One little girl was all dressed in her Halloween costume, but she was shy about going to a stranger's door and saying "Trick or Treat." When she saw the other kids getting candy, she overcame her shyness.

STIMULUS	ORGANISM	RESPONSE
= sees other	=	=
= children	=	= participates
= trick or	= child	= in the
= treat and	=	= trick or treat
= get candy	=	=

Another factor is whether the subject regards the model as a high status figure. Over the past decade, hip hop music artists have worn their pants low, exposing their abdomens or boxer underwear. This has become a fashion mode for many young men.

STIMULUS	ORGANISM	RESPONSE
= sees rap	=	=
= artists	= adolescent	= wears pants
= wear their	= male of	= low
= pants low	= today	=
=	=	=

Sixty years ago the most famous actor in Mexico, Cantinflas, portrayed a character with low pants in many popular films. But this character was portrayed as being a comic figure, clumsy, poor, and socially inept. Anyone who wore his pants low at school in Mexico would be teased by the other students.

STIMULUS	ORGANISM	RESPONSE
= Cantinflas	= males of	= wear their
= character	= the 1950s	= pants high
= wears pants	=	=
= low	=	=

Another form of learning is **cognitive** problem solving. This works with organisms with highly developed cerebra. Rather than waiting for some reinforcement before acting, the organism predicts the future consequences (reinforcement) of its behavior. One chimpanzee was shown some bananas at the top of the cage. There were some cardboard boxes in the cage. He figured out how he could build a tower out of the boxes and then climb that tower to get the bananas.

STIMULUS	ORGANISM	RESPONSE
= bananas = suspended = high in cage=	= chimp	= builds a tower= = and climbs it = = to get the = = bananas =

When such a solution emerges spontaneously, without the organism following systematic steps pursuing that solution, this is known as **insight** learning.

The **transfer of training is where old learning impacts on new**. The organism may develop a new insight about how to apply old skills or strategies to new problems. When similar stimuli call for similar responses, old learning can facilitate new. Many pilots who have learned to fly on propeller planes find that many of their skills transfer to flying jet aircraft. When picking up a new language (like German) after one has already learned English, similar words will be learned most easily.

New stimulus (German)	Old response (English)
Mann	Man
Haus	House
Buch	Book
Ja	Yes

But when the new stimulus calls for a very different kind of response (e.g., flying a helicopter after flying a plane) some subjects might find that the old learning gets in the way, interfering with the new skills.

New stimulus (German)	Old response (English)
Elf	Eleven
Wand	Wall
Gift	Poison

When studying Portuguese after mastering Spanish, many students find that reading the new language is easy, because so many Portuguese words look like similar words in Spanish. However, when learning to speak Portuguese, many Spanish speakers find that learning the different sounds is made more difficult because of the tendency to try to go back to the more familiar sounds of Spanish.

UNIT 7: MEMORY

QUESTION #7.1: What is memory?

Memory is the amount of previously learned material that has been retained. Therefore, **retention** is another name for memory. There are two basic forms of retention: procedural and declarative.

Procedural memory is how to perform an action, in sequence. Athletic skills are one example of procedural memory. We learn the fundamentals, practice them over and over, and then they seem to flow naturally when we are in a game. Rehearsing for a dancing or musical performance would be other examples of procedural memory. Everyday examples might be remembering how to tie our shoes, drive a car, or get on the internet.

Declarative memory involves memory for facts, concepts and events rather than muscular procedures. Declarative memory may be episodic or semantic. **Semantic retention** is for the type of knowledge we associate with books and school: **names, dates, and numbers.** But it can also include personal information, such as telephone numbers and addresses.

Episodic retention involves memories for specific events. Flashbulb memories are of particularly vivid events that persist in our minds. Some of these events became flashbulb memories because they were so important, or connected with intense emotions (pleasure, pain or pride).

Case Study: Mr. B, now in his 60s, has less than a dozen episodic memories that easily come to mind. Some of these flashbulb memories are probably shared by most of the members of his generation of Baby Boomers. Mr. B remembers coming out of swim class in November of 1963 to learn that President Kennedy had just been shot. In 1968 he was in his college dorm when he heard a great shout coming from the other students, and he learned that President Johnson would not seek re-election. He remembers walking home from the movies in June of 1968 to learn that Senator Robert Kennedy had been shot. Fifteen years later, he remembers the look on his business partner's face when he arrived at his office to learn that the space shuttle had just exploded. On September 11, 2001, he remembers flipping TV channels while he was on his aerobic exercise machine, when he noticed a news report from New York City. Mr. B also had personal flashbulb memories associated with intense joy (hitting a game winning grand slam home run at age 10), fear (getting held up at the point of a gun at age 24), worry (wearing the wrong shoes on his wedding day), terror (accidentally starting a fire at age 9), and pain (being verbally tormented by an adult when he was just 7).

QUESTION #7.2: How can memory be measured?

There are four measures of retention: redintegration, relearning, recall, and recognition.

Redintegration is the process of assembling a complete memory on the basis of partial cues. An essay exam would be an example of a test of redintegration: the question contains a few partial cues or suggestions about how to structure the answer. If the student knows the material, she will be able to construct a complete answer from what she has retained from the course. Redintegration does not result in objectively quantifiable scores that researchers need for employing statistical analyses of data. (Indeed, note that the grading of essay exams is somewhat of a subjective procedure on the part of the instructor.) Within professional psychology, redintegration is more commonly employed within the context of psychotherapy.

Case Study: Ms. S was 20 when she came in for psychotherapy in 2002. The therapist determined that her present anxieties might be related to something that happened in her childhood, perhaps around the age of ten. Her therapist helped her begin to piece together a more complete memory of that time. At age ten she would have been in the fourth or fifth grade. Ms. S was able to remember her best friend at that time, and how she became very sick that year, and Ms. S herself began to worry that she herself might also become ill. The therapist also reminded her, that she would have been ten years old in 1992. That was a year after the Persian Gulf War. (Ms. S had no connection to that.) 1992 was the year of the Clinton - Bush - Perot presidential campaign. (Ms. S remembers doing a report on Ross Perot for school, but could not find any important associations with that.) 1992 was the year that the Atlanta Braves won the World Series against Toronto. Although Ms. S was not a baseball fan, this fact triggered a series of relevant memories. She remembers her step-father getting upset with her little brother because the child was making noise during the TV game. Ms. S then remembered that year was very difficult in terms of domestic strife: the step-father and her mother soon separated, and they had to move to a smaller apartment in a worse part of town. These recoveries of memories led to other relevant tie-ins later.

STIMULUS		ORGANISM		RESPONSE
=====		=====		=====
= prompts =	=	=	=	= redintegration=
= about events =	=	=	=	= of painful =
= and normal	=====>=	patient	=====>=	= memories of =
= age related =	=	=	=	= her past =
= activities =	=	=	=	= =
=====		=====		=====

The skills (and agenda) of the therapist are major factors in the outcome of redintegration. What the therapist expects to be told, and what the patient is verbally reinforced for reporting have an impact on what is reported by the patient (and even what the patient comes to believe about the validity of a memory).

Case Study: Ms. W, age 33, has been having intimacy problems in her recent marriage. When she heard a lecture about Satanic Ritual Abuse at her church, she went to see a counselor who specialized in this area. At first, Ms. W described her own childhood in most favorable terms. The counselor accused Ms. W of denial. After more than a dozen

sessions, Ms. W was able to reintegrate a horrible memory about her own father being a satanic priest, and the whole family having to watch sacrifices of little animals, and later all of the children were sexually abused. Both of Ms. W's parents, and her three older siblings completely deny these reports.

STIMULUS	ORGANISM	RESPONSE
= accusation =	=	= redintegration=
= of denial, =	=	= of false =
= reinforce- >=	>= patient >=	>= memories of =
= ment of her =	=	= her past =
= admissions =	=	= =

Satanic Ritual Abuse does exist, but so does **false memory** syndrome in which people become convinced that they have had an experience (such as Satanic Ritual Abuse, sexual abuse, or alien abduction) when all of the objective evidence suggests that the experience did not happen. Under hypnosis, or during intensive therapy, patients can be convinced what did not happen really did, and vice versa.

Over a hundred years ago, **Freud** himself came to the conclusion that his female patients' reports of childhood sexual abuse were merely fantasies from a repressed Electra Complex (the female version of the Oedipus Complex). Freud probably then erred on the side of discounting some accounts of real abuse later on. One of the greatest challenges for psychotherapists is to investigate the patient's past in such a way as to liberate (but not fabricate) such painful memories. There have been so many overly exaggerated reports of satanic ritual abuse in children's day care centers over the past few decades that we run the risk of having real cases go ignored, because law enforcement and juries may no longer believe any such claims.

Courtroom attorneys are well aware of the limitations of reintegrative memory in eyewitness testimonies. The lawyers know how to phrase questions in such a way as to shape the process of reintegration, both in the witness who is trying to remember what happened, and in the minds of the jurors who will have to remember what the witness said. An attorney may ask "How fast was the car going when it smashed into the tree"? fully aware that the word "smashed" will imply a greater speed than a different word like "hit" or "came into contact with." A lawyer may ask "What color was the man's hat"? and even if the witness cannot remember the answer, both witness and jury may now think that the man was wearing a hat.

STIMULUS		ORGANISMS		RESPONSE
= question	=	=	=	=
= about the	=	= members of	=	= vote to
= hat worn	=	= the jury	=	= convict the
= by the	=	=	=	= defendant
= perpetrator	=	=	=	=

Relearning measures how much time it takes the subject to come up to a certain level of competence. Relearning can be employed with either procedural or declarative retention. The important thing for the researcher to measure is the time savings that can be attributed to retention of previously learned material. A ballerina has not danced the part of the Snow Queen in the Nutcracker for ten months. Now, in October, she is again assigned the part. One way to measure how well she remembers is to see how many hours of practice it takes to get her up to the same level of performance she had the previous December. If it takes her twenty hours to master the part this year, while it took her fifty hours during the first year she had the part, that savings of thirty hours can be attributed to retention.

Recall asks the subject to repeat what has been previously learned, but **no cues are given**. The results of the test can be scored quantitatively as the number or percentage of right answers. Recall is often used with tests of declarative memory, and is represented by fill in and short answer tests.

MEASUREMENTS OF RETENTION				
Type of memory	Cues	Format	Scores over time	Example
REDINTEGRATION	Yes	Qualitative	. . .	Essay exam
RELEARNING	Yes	Quantitative	Decline	Time savings
RECALL	No	Quantitative	Decline	Short answer
RECOGNITION	Yes	Quantitative	Decline	Multiple choice True / false

Recognition is where the original content is reproduced, and all the subject has to do is to identify it as being correct. Both multiple choice and true/false tests would be examples of recognition. **Recognition usually gets the highest retention scores.**

QUESTION #7.3: What are the stages in the processing of memory?

Most of the experiences that you have had and things that you have studied are not retained (at least, we cannot measure their retention through any of the techniques discussed above). Your memory is not like a bucket, but more like a fishing net hung out over a bridge on a river. Miles of river water have passed through that net, but very little was retained: some debris and hopefully some fish.

The reason for this limited retention of human memory is that, in order to be retained, something must be processed through the various stages of memory: sensory, short-term, and long-term. Failure to successfully process at each stage means that the item will be forgotten (and that is the fate of most of what comes into the mind). These stages are like different parking lots at the airport: you can only leave your vehicle there for so long before you get into trouble.

Sensory memory is the first stage. The retention at this level can only last for a few **seconds** at most. Iconic retention refers to visual images at this stage. Echoic retention refers to sounds that have just been heard. Memory at this stage is quite fragile, and quickly fades away if not further processed ("in one ear and out the other"). Notice what happens when you get a phone number after dialing 411: if you do not write it down immediately, or keep repeating it to yourself, you may have forgotten it by the time you try to dial the number.

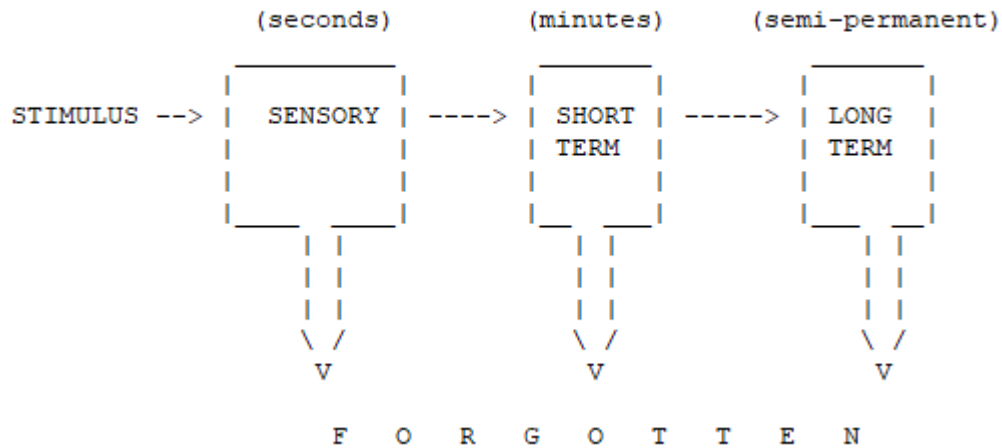
Short term memory is the middle stage, with an average capacity of **minutes**, although this might cover a few hours in some situations (and seconds in other situations). During short term, memory is still pretty fragile. To use a computer analogy, if you are writing a document on the screen, and save your program only about every twenty minutes or so, what has been typed on the screen in the last few minutes is like short term memory, and may not survive an unexpected power outage.

Case Study: Mr. R, age 43, was diagnosed with major depression. He had several trials of different medications, without any symptomatic relief. He has made no progress in psychotherapy. His psychiatrist recommended electro-convulsive therapy (**ECT**). Mr. R spent the night in the hospital. At 6 A.M. he was awakened and prepped for the procedure: a protective mouthpiece to prevent damage to the teeth and tongue, muscle relaxants to prevent bone fractures. The electric current passed through his brain served to induce a convulsion and depolarize his neurons. After a week of these treatments, he was more active and in a better mood, but there is one important side effect. Each treatment erases whatever was in his short term memory. When he awakens, he is groggy, and his head hurts, but he cannot remember the procedure or the prepping. Indeed, one of the reasons that he is being given his ECT so early in the morning is so that he will not lose important memories of what he is working on during the day or studying at night.

STIMULUS	ORGANISM	RESPONSE
=	=	= depression =
= electro-	= depressed =	= is reduced =
= convulsive	= patient =	= but what was =
= shock	=	= in short term =
=	=	= memory is gone =

Long term memory is the last stage of processing, and the **semi-permanent** stage. If we want to remember something tomorrow, it will have to be consolidated in to the long term stage today. Going back to our computer analogy: the long term memory is like the internal hard disk or flash drive on which the computer stores its files. We say that after these files are saved they are "semi-permanent" because it is possible that they could be lost by a hard drive crash or other physical problem with the media.

S T A G E S O F M E M O R Y



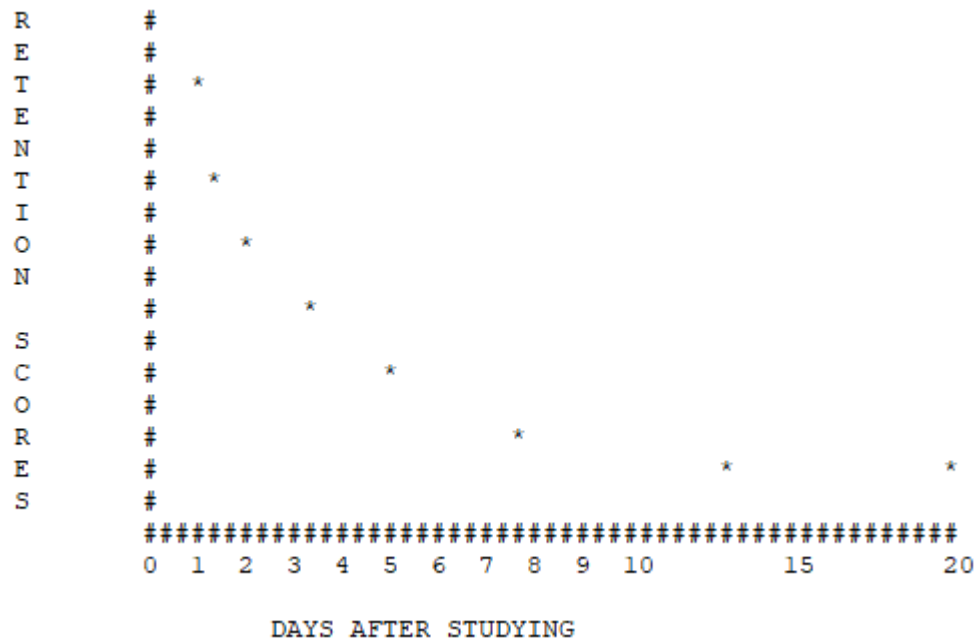
The hippocampus is the part of the brain that consolidates short term memory into long term. Damage to the hippocampus would make it impossible for an individual to form any new long term memories, but he would still be able to use his previously created long term memories, as well as anything currently in the short term stage. A computer analogy might suppose that you could not save any new files, but you could still read from old, previously saved files, and print from new files you were creating on the screen (but as soon as you turn the computer off, those new files are gone).

Case Study: Back in the 1950s, Mr. E, then 25 years old, was diagnosed with a brain tumor. The neurosurgeons were able to remove the tumor and save his life, but during the operation there was substantial damage to the hippocampal area. Mr. E could form no new long term memories. His short term memory was still very good, and so was his retrieval of previously stored long term memories. An avid baseball fan, he could recount the details of each of the World Series games in which the Yankees faced the Dodgers (1947, 1949, 1952, 1953, 1955, 1956) occurring before his surgery. But show him a new sports magazine, he will read it attentively and be able to discuss it with intensity right afterward, but tomorrow you can show him the same magazine, and it will be like he is seeing it anew for the first time. When old high school friends came to visit, they could talk about old times, and talk about the baseball game on the television that they were watching together,

but a couple hours later Mr. E would forget everything about that game, or even that his friend had been over to see him.

QUESTION #7.4: Why do we forget?

Forgetting is a natural, inevitable part of the learning process. This was established by some of the earliest laboratory research on retention by Hermann **Ebbinghaus** over 130 years ago. He had his subjects learn a list of "nonsense syllabus" composed of three letters (a consonant on each end and a vowel in the middle). All of these stimuli were therefore the same length, and Ebbinghaus tried to avoid having syllables that were similar to real words (just in case that would give some subjects any added help). Regardless of how the retention was measured (relearning, recall or recognition), **the longer after retention, the more forgotten.**



In this research, the independent variable was the amount of delay selected by the researcher. The performance score of the subjects would be the dependent variable. Notice that the correlation is inverse (negative): the longer that Ebbinghaus waited to test his subjects, the less well they did in terms of retention scores. Also notice that the decline was not linear. The subjects tended to forget most in the first few days (or even hours), and then the decline leveled off as the subjects got down to the minimum that they would probably retain permanently.

Forgetting can take place at any stage in the memory consolidation process, but the most likely cause of that forgetting differs at these different points of the process.

Encoding failure means that the memory never got consolidated beyond the initial sensory stage. The subject was just not paying enough attention to move the item into short term memory. If you are listening to the radio and all of a sudden the phone rings (and you answer without bothering to turn off the radio) and then devote your attention entirely to the phone conversation, what is being said on the radio is not making it into your short term memory.

Case Study: Mr. B, only 61, has shown no signs of clinically relevant dementia. He has a good memory, which is helped out by the fact that he is a creature of habit, and may assume that his tools and other important objects can always be found in their proper place. For example, he keeps his keys in his right front pocket or else on the stand on top of the refrigerator. One day as he was arriving home, he heard the phone ring. He was expecting an important call, so he wanted to get to the phone as quickly as possible. He was wearing an especially tight pair of jeans that day, and the big ring of keys did not quickly go back to his right front pocket, so he just threw them on the little side table next to the front door. He remained on the phone for half an hour discussing some important details of one of his investments. Then he fed the cat, made a few more phone calls, wrote some checks, and decided to go to the post office to mail them. When he reached for his keys in his pocket, it was empty. He looked on the stand above the refrigerator, and neither were they there. He reasoned that he must have brought his keys from the car in order to get into the house, so he retraced his steps from the front door, saw the keys on the side table, and deduced the sequence of events that must have resulted in the keys being mislaid. The fact that he had put his keys on that table was not consolidated beyond sensory stage: encoding failure.

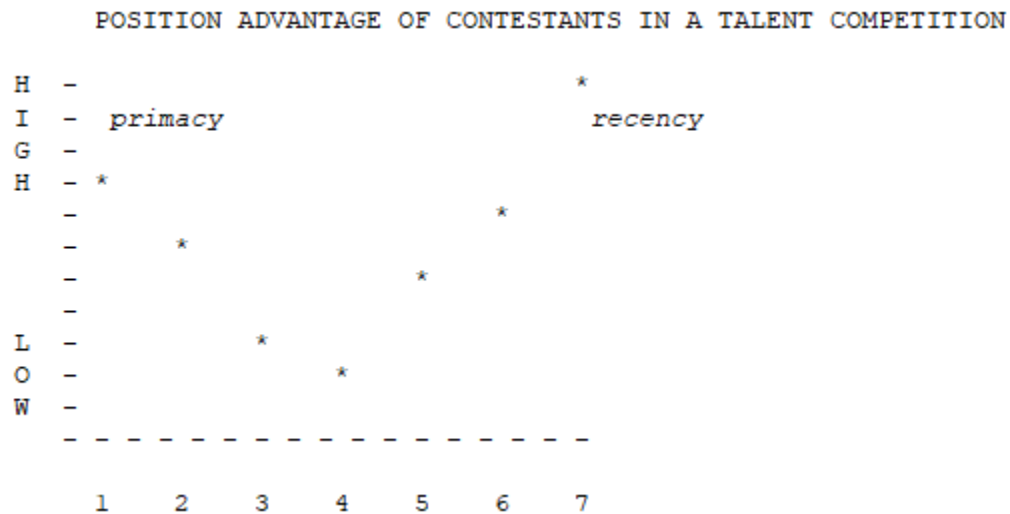
STIMULUS	ORGANISM	RESPONSE
=	=	=
= ringing	= man coming	= misplaces
= telephone	= in door	= his keys
=	=	=
=	=	=

Similar forms of interference can occur at other stages of consolidation. Especially during the short term phase, memory is vulnerable to **serial position effect**. When you have to learn several different items in a series, one right after the other, there is the danger that one will crowd another out of memory. **Proactive interference is when the first things crowd out the subsequent material.** The advantage of what is first learned is called **primacy: it gets there first and gets established.** Nothing has come before to cause a proactive interference with it. **Retroactive interference is when the things that come later disrupt our retention of what came before.** **Recency is the advantage of what is learned last:** nothing comes later

to crowd it out with retroactive interference. If a subject has to learn a list of names (or non-sense syllables) the ones most likely to be remembered are the first and the last, while **the ones most likely to be forgotten are those crowded out in the middle: that's the serial position effect.**

One practical application of this is to avoid studying two different things in one short time period, back to back. Suppose you have two final exams the next day, and need to study for them both. It would be wise to study one until you are done with it, then give yourself at least a half hour break from studying (e.g., go and have dinner) before getting started on the other one.

Another practical application would come in those forms of competition in which a series of contestants must compete on stage, one right after the other, before a panel of judges who will then announce their decisions after the last contestant has finished. Most speech, talent and beauty contests are set up in this fashion. Serial position effect says that it is not best to be in the middle, because these will be most easily forgotten.



Of course, if contestant number four were head and shoulders above the others in terms of talent, she may overcome the advantage of serial position effect, but if there is little difference between how well the contestants really did, the advantage of recency or primacy can be enough to determine who wins.

STIMULUS	ORGANISM	RESPONSE
fourth		
contestant		can't remember
was in the	judge	very much about
middle of		number four
seven		

There is one type of contest in which primacy might be a great disadvantage. In those contests in which the judges must announce their ratings of each contestant as soon as that contestant finishes, and before the next contestant gets on stage (e.g., Olympic figure skating, gymnastics, diving), the judges have a motive to restrict the points awarded to the first contestant, out of fear that the next one will be even better.

This situation is akin to what is found in many job interviews in which the company will interview applicants as they become available, and keep on interviewing until the position is filled. Unless the company is really desperate to fill that position immediately, many interviewers may use that first interviewee as a calibration candidate to see what is out there in the labor market. No matter how good that first candidate looks, there may be someone better. Many interviewers in this situation hire the first acceptable candidate who was better than the first interviewee. (Of course, if the process first identifies a fixed number of candidates to be interviewed, and they are interviewed in short order, and the hiring decision is not made until the last one is interviewed, then the advantage of primacy returns.)

Another application of interference applies to **prospective memory: our intentions to do things in the future**. One of the main reasons why people forget to do something is that they have become distracted by some newer event or thing to remember.

Case Study: Mr. V, age 33, is a student who works full time in a restaurant and is a father of two. In the beginning of the semester, the professor mentioned that the class would have a field trip on the first Saturday in November. Mr. V did not write it down, and his professor did not mention the date again. In the meantime, his daughter's soccer team advanced to the regional finals, and he eagerly volunteered to drive several children to the soccer game. When he returned from the game, he sat down to do a little homework, and then remembered that he had missed the field trip. It had slipped his mind because he had been distracted by thinking about the soccer game.

Retrograde amnesia can be caused by a physical trauma to the brain that **disrupts short term memory consolidation into long term**. The trauma can be an electro-convulsive shock (as seen in the previous case of Mr. R) or a physical blow to the head.

Case Study: Mr. Q is 25, married for three years, and father of a two-year-old son. One morning while riding to work on his motorcycle, he had an accident and suffered a severe blow to the head. He woke up in the hospital, with his wife by his side, but calling the name of his high school sweet heart. His amnesia had (temporarily) blotted out a large part of his life. His memories started to return, but in reverse order. A couple weeks later, he could remember graduating from high school and joining the army. A week after that he remembered being overseas when he got a letter from his then girl friend saying that she

had met someone new. Later he remembered coming home, getting his present job, and meeting his wife, getting married, and the birth of his son. He eventually recovered almost all of his old memories, except for the morning of his accident, and he probably never will recover those memories, because they were only in that vulnerable short term phase and never made it into the semi-permanent structure of long term.

STIMULUS	ORGANISM	RESPONSE
=	=	=
= blow to head =	= motorcycle =	= retrograde =
=	=>= rider >=	=>= amnesia =
=	=	=
=	=	=

Anterograde amnesia refers to the inability of the individual to form any new long term memories (as in the case of Mr. E with the damage to the hippocampus). Some blows to the head can produce anterograde amnesia as well as retrograde. **Perhaps the greatest cause of anterograde amnesia is dementia, such as Alzheimer's disease.**

Case Study: Ms. G was 90 when she was examined in the nursing home. The staff had identified her as a behavioral problem. She used foul and aggressive language, everything from barnyard vulgarities, to sexual innuendoes, to racial slurs. Ms. G would insult the other patients, staff, and even visitors. When the psychologist examined her, Ms. G had no short term memory abilities. She could answer questions about her past (e.g., that she had been a barmaid and singer in a speakeasy back in the days of prohibition) but seemed quite confused about when her family had last visited her in the nursing home. The psychologist inferred that Ms. G's unacceptable language was in part an attempt to get some attention and respect from the staff and other patients. The psychologist decided to find a more socially acceptable way to accomplish this, and so he arranged for Ms. G to play the piano in the recreation room. She chose one of the songs that she had played 50 years before back in some honkytonk. It was played well enough so that the other patients could recognize it, and they clapped when Ms. G was done, and even asked her for another one. Ms. G thought through her repertoire for a moment and then agreed to play another song, and she started, playing the same song. Ms. G could remember that old song (because that was in her long term memory) but she could not remember that she had just played it (because that would require a functioning short term memory).

When we no longer need a particular memory, it may decay. Most food servers find that once they have finished with a table, and focus their attention on other customers, the details of the old table quickly fade. **Passive decay associated with lack of use can occur even in the semi-permanent encoding of long term memory.** Trying to remember the mailing address or telephone phone number of a former employer may be difficult if you have not needed it for a while. For future reference,

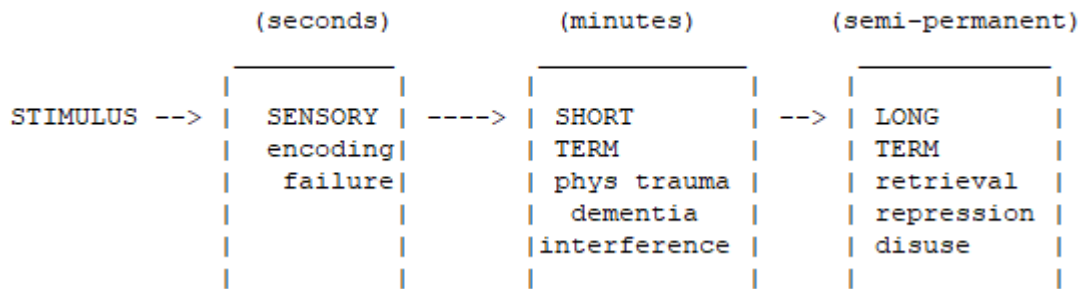
it would be wise to copy down that information when you leave your current employment.

Retrieval failure describes the situation when the memory made it into long term, but now the subject is having difficulty accessing it. One example of this is the **"tip of my tongue" phenomena**. The subject has the right answer, and knows he has the right answer in his memory, but he cannot find it just now. A few moments later (or maybe the next time he needs it) the subject may be able to access that memory with no difficulty. One frequent situation in which the "tip of my tongue" phenomenon occurs is when you see someone you have not seen in a while, like an old classmate. You remember the person's face, and you know that you know the name, but you cannot think of it just now. One of the things that make this process more difficult is that some of the old cues that you associated with the person (e.g., where she sat in class) might not be present. You might be able to help yourself out by doing a little redintegration, coming up with a few associations, and the rest will then come: she did well on the midterm exam, her brother was a starting quarterback at our high school the previous year, number 14, starts with G, Gomez? No, Gonzalez!

Another example of frustrating retrieval failure comes in the situation of trying to remember where you hid something valuable. You probably have not thought of it (rehearsed the memory) since you hid it. Indeed, when you selected a hiding place you probably tried to think of a place with no logical connections, so that a burglar would not think to look there. The result of that process is that now you have no clue of where to look either.

One reason why recognition consistently gets the highest retention scores is that it gets around retrieval failure. It gets the answer off of the tip of your tongue, and you merely have to identify it as correct. If your old classmate had a sign around her neck reading "My name is either Gonzalez, Gomez or Garcia" you probably would have selected the right one.

HOW FORGETTING TAKES PLACE



Repression is an unconscious motive to forget an emotionally traumatic memory. The pain of reliving the experience creates an unconscious mental block that prevents us from recovering it. Repression was a major theory developed by psychoanalysis.

Case Study: Ms. Z, now 95, was a young woman in Poland during World War II. She has flashbulb memories for some of the events of that time, such as the day the war began on the morning of September 1, 1939. However, some of the painful events that occurred at that time (such as her rape by German soldiers) she has repressed. Whether it is best to try to get around the unconscious mental block and liberate the memory is a decision that a psychotherapist would have to make. Hypnosis and psychotherapy could get around the repression (or they could activate some false memories) and the net result could be counterproductive in some cases.

QUESTION #7.5: How can we improve memory?

Mnemonics are techniques for improving memory. Rote memorization is simple repetition of the stimuli over and over again without any real cues or understanding. **Rote** is one of the **least effective**, but most widely used mnemonics.

Eidetic images involve pairing semantic memories with **vivid visual** cues. Most children are better at this than adults are. Some individuals claim to have a photographic memory in which they find it very easy to recall what has been visualized.

Case Study: Mr. B uses eidetic images to help his recall. Before going around town on errands, he takes an imaginary mental video of himself driving around to the bank, post office, grocery store and gas station. Within the grocery store, he sees himself getting cat food, cream cheese, and vegetables in the exact order in which they are arranged in the store. When he meets a new client, he tries to associate something about the person's face with the last name. When he met Maria Coronado, he imagined her coronation as a new queen, he visualized the archbishop ceremonially placing a crown on her head (in Spanish *Coronado* means crowned). The limits to this approach come from the fact that the subject can get mixed up about how the image relates to the name. Mr. B once tried to remember a Mr. Sherlock by visualizing him in the deerstalker hat used by Conan Doyle's fictional detective. Unfortunately, Mr. B then called him "Holmes" instead of Sherlock.

One way to improve retention of non-visual material is to associate it with things that can be visualized. This is a technique as old as the ancient Romans, and is known as the method of loci. Imagine walking through a familiar area, such as your home, or the campus of the college. As you come to familiar sites, imagine that you can see the things you need to remember. Suppose you have to remember the first four presidents of the United States: Washington, Adams, Jefferson, and Madison. Your apartment also has four rooms: living room, kitchen, bathroom, and bedroom (and this is the order that you would see them if you were walking into your apartment). So put the first president, Washington, in the first room, the living room. Imagine him standing on your sofa as if it were the boat on which he crossed the Delaware River standing (well, at least he was standing in the painting). Now, the second room is the kitchen, and so you would put John Adams there.

Imagine him going over to the refrigerator, opening up and taking out a beer and remarking that his cousin Samuel had brewed it. Next comes the third room, the bathroom, so put the third President Thomas Jefferson there. Remember that he was an architect who designed his own home at Monticello. Imagine Jefferson in your bathroom, amazed at the flushing toilet. Last comes the fourth room, the bedroom. Imagine James Madison in a night shirt with a night cap on his head under the covers next to his wife, Dolly Madison.

Songs and sayings can be effective mnemonics. When I was in the third grade, I remembered how to spell GEOGRAPHY with the saying *George Eagle's Old Grandmother Rode A Pig Home Yesterday*. Many advertising copywriters try to come up with little jingles that will stick in our heads to make us remember the names of their products.

Conceptual memory tries to associate details to be memorized with specific concepts, **categories** or goals. It is easier to remember a few key rules rather than tons of specific data. For example, instead of remembering that 40 degrees Celsius is 105 Fahrenheit, and 30 degrees Celsius is 86 degrees Fahrenheit, etc., it is just easier to remember the formula for conversion: $F = C \times 9/5 + 32$. The downside of conceptual memory is that it may distort our trace memories to match the convenient concepts and categories. Some voters try to remember who to vote for with a simple party concept (*Republicans good, Democrats bad*) but such a stereotype might ignore the exceptions (the Republican who is a professional politician, and the honest Democrat).

Research on conceptual memory	
<i>Researcher(s)</i>	Elizabeth Loftus
<i>Subjects</i>	Students
<i>Type of research</i>	Experiment involving five different groups
<i>Factors held Constant</i>	All subjects were shown the same video of automobiles getting into an accident.
<i>Independent Variable</i>	Each of the five groups heard the accident described with a different phrase (e.g., "the cars contacted each other" or "the cars smashed into each other")
<i>Dependent Variable</i>	Subjects had to estimate how fast the cars were going when the accident took place
<i>Results</i>	Subjects who heard "smashed into" estimated that the cars were going faster compared to those who heard "contacted"
<i>Conclusion</i>	Using concepts as a mnemonic can distort the trace memory

Motor memory involves muscular practice. This is very prominent in procedural memory, and accounts for the relatively high retention of such things as riding a bicycle or swimming even after years of inactivity. The use of gesturing helps memories for semantic content as well if the subject can associate the two.

Overlearning refers to practicing the material even after the point where the subject can demonstrate perfect recall. Overlearning is a very powerful mnemonic for both procedural and semantic memories. Overlearning should not be confused with the idea that the memory is a

muscle, and that practice by memorizing one thing will help you retain other things. You will not help your retention of the content of this course by going out to the parking lot and trying to strengthen your memory muscle by repeating the license plate numbers. If anything, that might produce a kind of interference with learning the content of the course. Overlearning means practicing and practicing the specific material to be retained.

Spaced practice is a better mnemonic strategy than massed practice.

Spaced practice breaks up study time into smaller units, while massed practice is like a marathon. If you decide that you will devote a total of ten hours studying for one of your finals, it would be better to do two hours a day, for five days, rather than ten hours in one long period the night before. Such marathon study sessions lead to fatigue rather than better retention.

Sleeping right after learning is a good technique to reduce retroactive interference. Indeed, you can use an audio recording of some of the most important concepts in this course, and play it while you are trying to go to sleep. Once you are actually in the first stage of sleep, there is no real learning going on because during sleep it is hard to consolidate memories much beyond the sensory (which is another reason why we tend to forget most of our dreams). However, those things which you hear on the recording, just before you fall into sleep, will be very likely to be retained because of your relaxed and focused state of mind, and the advantage of the recency: nothing came later to crowd out these ideas.

Mood congruence is another possible mnemonic, but one not easily employed. People are more likely to be able to retrieve a memory if they are in the same mood state now as they were when the memory was formed. Notice how when a couple gets angry at each other, they can remember all the other times when they were angry with each other. When they are happy they remember the happy times more easily.

Environmental structuring is a mnemonic useful as part of a routine. In its simplest form, it means physically arranging things so that we will bump into them in time to remember to do them. Environmental structuring is particularly useful as a technique for reducing prospective forgetting. We can put things in certain places so that we are more likely to remember to do them.

Case Study: Mr. B., a 62-year-old businessman, is extremely vulnerable to encoding failure and retroactive interference: things are always occurring, demanding his immediate attention, and distracting him from things he was intending to do. He compensates for this by structuring his environment in several ways. Whenever he thinks about calling some one, he makes a note in his phone log. Whenever he thinks about an errand that he must make, he puts a note or some papers associated with the errand by the briefcase that he uses when he goes out to his car.

Another use of environmental restructuring is to guard against the type of memory loss associated with late life dementias: helping a patient remember what he has already done so that he does not have to worry (or go and do it again). One of the best uses of this approach would be

those handy pill boxes which are coded to the days of the week, with seven little compartments labeled SMTWTFS.

Case Study: Ms. T, age 83, always enjoyed sending out greeting cards for the holidays. Her memory was failing, and she had to go live with her daughter. The first year, the daughter noticed that Ms. T sent out cards right after Thanksgiving, and then started getting cards from her old friends. She enjoyed getting these cards, but they would just make her nervous as she began to worry whether she had already sent a card to her friend (and so she would send another card just to be sure). Several of her old friends received multiple cards, and correctly inferred that Ms. T was getting confused. Next year, the daughter decided to employ a more systematic approach. When her mother sent out the cards, each name in the address book would get a sticker to indicate that the card had been sent for that year.

HOW TO REMEMBER THINGS		
<i>Mnemonic</i>	<i>Description</i>	<i>Retention</i>
Rote	Repetition without Understanding	Poor
Eidetic	Visual image	Good
Conceptual	Logical links	Good, but has some distortion
Motor	Uses muscles, Not just brain	Excellent
Overlearning	Repeated practice	Good
Spaced practice	Include rest breaks	Good
Sleep after learning	Make what you learn the last thing you do before sleeping	Good
Mood congruence	People more easily remember things when in the same mood as when it happened	Hard to use
Environmental restructuring	Arrange physical objects so that we will run into them in order to remember them	Good but, sometimes hard to use

UNIT 8: COGNITION

We are approaching the limits of the S-O-R model. As we move into the topic of cognition, we shall see that it is becoming less important *what* an organism experiences, and more important *how* the organism understands those past and present experiences (and decides what to do in order to achieve better future experiences).

QUESTION #8.1: What is cognition?

Cognition refers to **concept formation, thinking, reasoning, logic, language, beliefs, problem solving, and decision making**. These are higher functions of the cerebrum, and distinguish humans from lower forms of life (but not necessarily from other mammals).

Concept formation is how an organism discovers (or creates) a pattern among sensations, memories, or thoughts. This is an extension of the figure/ground perceptual cue of similarity versus contrast. We can categorize things together based upon a recognized, assumed, or invented similarity, and then contrast them with things that are different (e.g., lacking that key concept). Sometimes we are given a couple of categories, and we have to figure out how they differ.

Concept formation	
<i>These are similar</i>	<i>And differ from these</i>
Raiders	Angels
Bears	D-Backs
Eagles	Pirates
49ers	Padres
Patriots	Tigers
Titans	Dodgers
Broncos	Orioles
Packers	White Sox
<i>The categories are Pro Football vs. Pro-Baseball teams</i>	

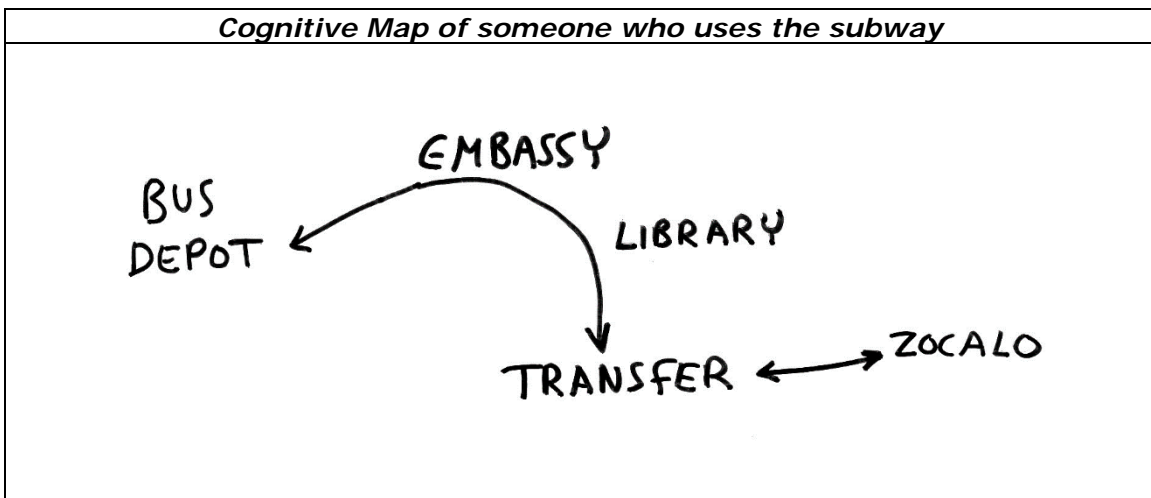
Sometimes, the subject confronts a new category and must infer what are its distinctive features.

Concept of "GURS"	
<i>These depict the category of GURS</i>	<i>And these do not</i>
B	=
Y	8
Q	+
C	/
U	!
K	<
J	}
G	&
<i>The category to be inferred is letters of the alphabet</i>	

Sometimes concepts are expressed in the form of an analogy that is based upon the concept.

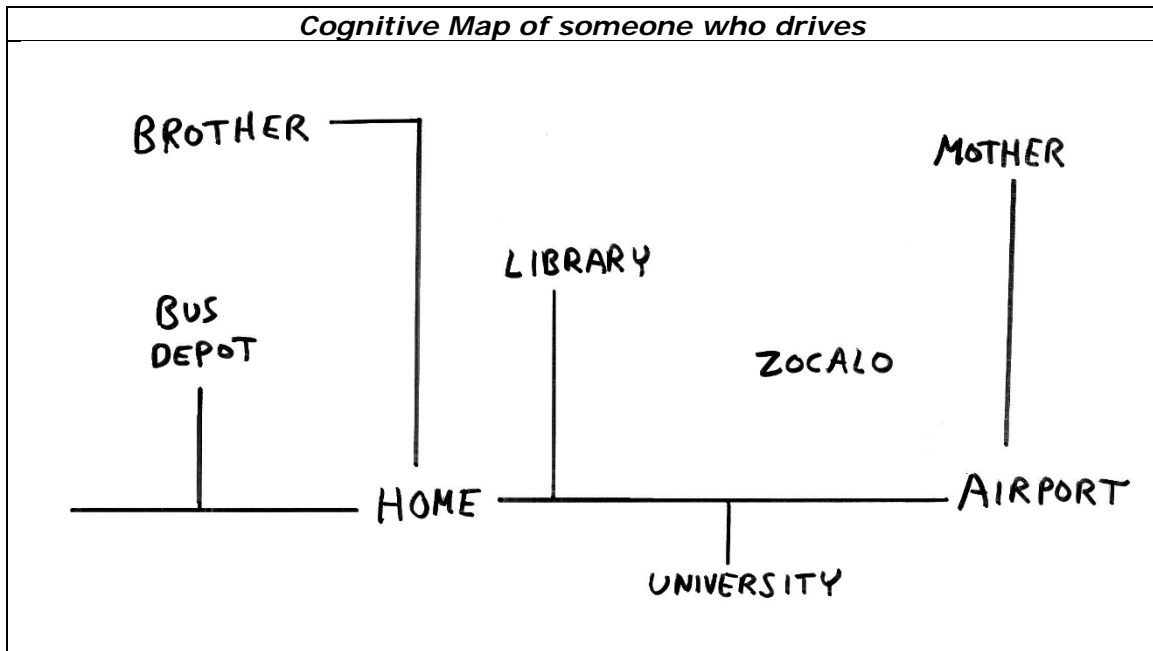
<i>Analogies</i>				
THIS	IS TO THAT	AS THIS	IS TO THAT	CONCEPT INVOLVED
Hot	Cold	Up	Down	Opposites
Austin	Texas	Albany	New York	Capital city
Glue	Fasten	Saw	Cut	Use, purpose, function
7	49	10	100	Squared
U.S.	England	Mexico	Spain	Former Colony

Cognitive maps are enduring and structured conceptual relationships that organisms use to understand their environments, solve problems, and make decisions. Here are two different cognitive maps of the same city. Neither closely parallels the actual geography, because both of these cognitive maps have been simplified to accentuate the role and needs of the person who uses that cognitive map.



This first cognitive map of Mexico City is used by a resident of Toluca, a city an hour to the west. He never drives in Mexico City, so the freeways, on-ramps, and one-way streets are not part of his cognitive map. When he comes into Mexico City (and arrives at the bus depot on the west side) he uses the metro subway or walks to where he wants to go: the U.S. Embassy, the Commerce Library, or the center of town (the *Zocalo*) where he likes to see the Aztec dancers. The only other thing that he uses regularly in Mexico City is the airport, so his cognitive map must include the transfer point where the subway line from the bus depot connects with the subway line that goes to the airport. If any special need to go to any other part of Mexico City arises, this individual will have to expand his cognitive map, or get a taxi and rely upon the cab driver's more extensive cognitive map of the city. If something were to change in this person's environment, for example if the Toluca airport were to begin offering more flights directly to the U.S., this might reduce the cognitive map even further.

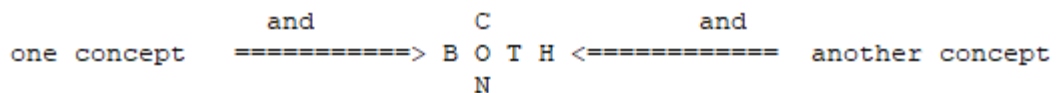
The cognitive map below is slightly more complicated. It is the product of a man who lives in Mexico City, but has an aversion to riding the subway. He has a car and likes to drive, so his cognitive map is based upon avenues and streets. He is not interested in going to the U.S. embassy or the Zocalo, but he also uses the airport, bus depot and commerce library, but he must get there on the streets and avenues. He also has a brother and mother living in the city, and visits them regularly. If the brother had his car stolen, then this driver would probably alter his cognitive map, since he would then probably stop by his brother's house before the two of them went together to visit the mother.



More complicated maps might simultaneously involve more than one concept. Separate concepts can be simultaneously related as **conjunctive** (**both/and**) or **disjunctive** (**either/or**).

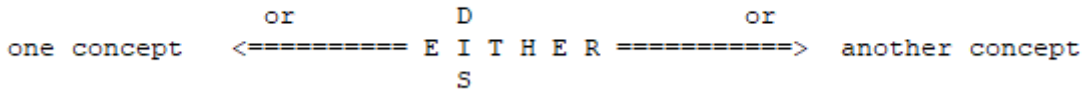
CONJUNCTIVE

con means with, together, BOTH



DISJUNCTIVE

dis, dysfunctional families get divorced
and the kids go with EITHER one parent or the other



Here is an example of how a conjunctive concept might form two criteria. Suppose you are starting up a new club on campus, and you want to have well-rounded members. So the by-laws state a conjunctive set of criteria ...

"Club members must be athletes who have lettered in a sport **and** good students who have maintained a minimum grade point average of 3.0."

Conjunctive Concepts			
		GRADE POINT AVERAGE	
		High	Low
A T H L E T I C S	High	QUALIFIES	DOES NOT
	Low	DOES NOT	DOES NOT

Notice that both athletic performance and academic performance constitute dependent variables. The purpose of this diagram is not to suggest that these two variables are correlated directly or inversely, but to show the four possible combinations of skills, and whether those individuals having that combination would qualify for the new club.

Now suppose that the club has too few members, and so the leadership decides that it has been too restrictive with the conjunctive approach to membership, and so it switches to the disjunctive approach...

"Club members must be athletes who have lettered in a sport **or** good students who have maintained a minimum grade point average of 3.0."

Disjunctive Concepts			
		GRADE POINT AVERAGE	
		High	Low
A T H L E T I C S	High	QUALIFIES	QUALIFIES
	Low	QUALIFIES	DOES NOT

Now, qualifying members can come from any of the three quadrants representing different skill combinations.

QUESTION #8.2: What is language?

Language development in the British Isles		
ERA	PEOPLE	LANGUAGES
Ancient	Celts	Gaelic, Welsh Cornish
43 C.E.	Romans	Latin
600 C.E.	Angles Saxons Jutes	German
1066 C.E.	Normans	French
Resulting language: English		

Language is a socially institutionalized sign system that facilitates communication between people (the interpersonal function) and thinking (the intrapersonal function). Indeed, John Watson once declared that thinking was nothing more than sub-vocal speech. It is certainly more than that, but Watson was insightful to notice the link between language and conceptual development.

Language development on the Iberian Peninsula		
ERA	PEOPLE	LANGUAGE
Ancient	Basques	Euskara
2000 B.C.E.	Iberians	Iberian
900 B.C.E.	Celts	Galician
800 B.C.E.	Phoenicians	Phoenician
500 B.C.E.	Greeks	Greek
250 B.C.E.	Carthaginian	Carthaginian
200 B.C.E.	Romans	Latin
70 C.E.	Jews	Aramaic, Hebrew
400 C.E.	Goths	Gothic
711 C.E.	Moors	Arabic
<i>Resulting languages: Catala, Gallego, Portuguese, Castillian</i>		

Linguistics is the hybrid social science that studies language. It is a blend of psychology, neurology, anthropology, human development, as well as scholarship from the humanities. A hundred years ago linguistics was known as philology, and fifty years ago it was known as semantics. (The treatment of **language dysfunctions, dysphasias**, is the task of another discipline, speech therapy.)

Most human and animal languages originated in sounds and/or gestures that developed within a living community. Phonemes are the small sound units of language. Specifically, **a phoneme is a range of sounds regarded as similar by the speakers of a language.** There is only one phoneme which all human languages seem to use, the broad AH sound found in FATHER. Hawaiian has few phonemes, so the words and names must have many syllables. Some dialects of India have several hundred phonemes, but most of which would not be identifiable to mere speakers of English. English has only 44 phonemes, slightly more than Spanish. These would include consonants such as the TH in THEY, the TH in THIN, the J in JOY, the V in VICTOR, the Z in ZEBRA. Spanish has the rasping J and trilled double RR that English does not have. The sounds of the D, T, and single R are slightly different in English and Spanish. Another great difference in phonemes would be the vowel sounds. Spanish just has five: broad AH, long A (short E), long E (short I), long O, long U. Native speakers of Spanish must struggle to hear the difference between GATE and GET, or BEET and BIT.

Words develop meanings. **Denotative meanings of words are explicit, precise, and objective.** These are the kinds of meanings that are found in a dictionary. When trying to learn a new language, it is easy when the different languages have a one-to-one correspondence of denotative meanings. To speak Spanish, just say PERRO for DOG. But sometimes one English word might have several Spanish equivalents, depending upon the context. The verb TO BE in English can be translated as SER, ESTAR, QUEDAR, or HABER in Spanish.

Comparative linguistics of the verb "TO BE"	
ENGLISH	SPANISH
I am northamerican.	Yo soy norteamericano.
I am ready.	Yo estoy listo.
Where is the Church?	Donde queda la iglesia?
Is there any more?	Hay mas?

The opposite can also hold. There may be several different English words that can be translated as the same Spanish word: KEY, WRENCH, and FAUCET are all called LLAVE in Spanish.

Connotative meanings of words are more implicit, subjective, emotional. What words connote is frequently determined by context, tone, body language, and other non-verbal cues. One of the difficulties in communicating informally via pure written text is that informality achieved through face to face (or even telephone) voice conversation may be lacking due to the non-verbal cues. Even with the use of smiley faces and other emoticons, people sometimes misinterpret and even take offense when no insult was intended. (This is why the attempt to insert a little humor can easily backfire, especially when not delivered face to face.) Children frequently misunderstand adults, men frequently misunderstand women because one might be talking in a connotative framework and the other is hearing in a denotative framework.

Contextual meanings		
TERM	DENOTATIVE CONTEXT	CONNOTATIVE CONTEXT
"Yeh, right"	Yes, correct.	No, very wrong.
"Baaad"	Not good.	Very good.

Another problem, particularly with spoken language, is the occurrence of [Mondegreens](#) in which people hear something that sounds like the words of the speaker, but those words have a completely different meaning.

Grammar is the system of rules for connecting words into meaningful sentences. Part of the difficulty in learning a new language is the challenge of learning not only words, but the grammatical rules: the sequencing of subjects, verbs, and objects, especially the idiosyncrasies of tenses of verbs, pluralizations, and punctuation. Consider how you would punctuate this sentence with commas.

Woman without her man is lost.

Do you understand it to mean ...

Woman, without her, man is lost.

or

Woman, without her man, is lost.

The punctuation changes whether it is the man or the woman who is lost.

Some vandals came across the following sign in front of a church of a controversial preacher.

Christ

is the answer!

... Pastor Smith

They only had to change the punctuation.

Christ!

is the answer

Pastor Smith?

The complexities of grammar, like those of connotative meanings develop over generations within the context of a living community that uses the language. Therefore, real human languages have an irregular core that defies logic or careful planning. We may now agree that the best way to form a plural noun is by adding S, so one COMPUTER becomes two COMPUTERS. But look at some of the oldest nouns in English: one CHILD, two CHILDREN; one SHEEP, two SHEEP; one WOMAN, two WOMEN (and it is even pronounced WIMMUN). We may now agree that the best way to form a past tense of a verb is to add ED, so I TEXT, becomes I TEXTED. But look at the oldest verbs in English and their pronunciations: DO (DOOH) becomes DONE (DUNN), AM becomes WAS, ARE becomes WERE.

Codes, ciphers, computer programming languages and other artificial languages such as Esperanto and Lojban have a consistent underlying logic that makes them easy to develop, learn and apply. But it also means that an outsider will have an easier time breaking the code, once the cognitive map can be inferred. During World War II, both sides developed secret code languages for communicating with diplomats, spies, ships at sea, and troops in the field. Given enough time and resources, the other side was always able to break the code. However, there was one battlefield language used by the U.S. Marine Corps when it communicated with "walky talkies" (the first cell phones) in the Pacific that was never decoded. That is because this language was not a code created according to some logical pattern. The Marines recruited native Navajo speakers and taught them to be "walky talkie" operators (*codetalkers*). When the Japanese eavesdropped on the conversations, they were convinced that this was a new code, and so they made recordings and sent them to Tokyo. But this code was never broken, because it was based on a real human grammar, full of unpredictable irregularities, and no one in Tokyo spoke Navajo.

The origin of human language is from a combination of environment and heredity. **B.F. Skinner** championed the **Behaviorist** position that **environment determined speech and language** use. He thought that both classical and operant conditioning played a major role in the child's acquisition of language. Classical conditioning gives the child an understanding of spoken words.

<i>(neutral</i>	<i>(unconditioned)</i>	<i>(organism)</i>	<i>(response)</i>
<i>stimulus)</i>	<i>stimulus)</i>	<i>[PASSIVE]</i>	<i>(elicited)</i>
sound CAT	----->	live cat	---->
		child	---->
			mental image of cat

after acquisition of new reflex

<i>(conditioned</i>		<i>(organism)</i>	<i>(response)</i>
<i>stimulus)</i>		<i>[PASSIVE]</i>	<i>(elicited)</i>
sound CAT	----->	child	---->
			mental image of cat

We associate Skinner even more with operant conditioning and the use of positive reinforcement. This was the key with which he understood the verbal behavior of the child. The reinforcements are both primary and secondary.

<i>(organism)</i>	<i>(response)</i>	<i>(reinforcement)</i>
<i>(active)</i>	<i>(emitted)</i>	<i>(positive primary)</i>
child	----->	says WATER
		----->
		gets something to drink

<i>(organism)</i>	<i>(response)</i>	<i>(reinforcement)</i>
<i>(active)</i>	<i>(emitted)</i>	<i>(positive secondary)</i>
child	----->	says LOVE YOU
		---->
		gets attention, approval

Reinforcement and modeling can also be used to understand such verbal behaviors as swearing and joke telling.

Noam Chomsky pointed out some of the limitations of a purely Behaviorist understanding of language. Chomsky argued that most animal language systems (e.g., bees, ants, birds, wolves) involve an inherited capacity to communicate with other members of the species. Within the human language, there are such great complexities (e.g., the shifting roles of first person and second person within a conversation) that a merely Behaviorist approach cannot explain the rapid acquisition of language within children. Chomsky contended that humans have an

inherited capacity to understand the deep structure of grammar, although the individual words and grammatical patterns they learn will be supplied by their unique environments.

Other species with highly developed cerebra can learn human language systems, and communicate with humans. The earliest attempts to teach apes to speak had little success, mostly because of the limited vocal equipment (tongue, lips, teeth, vocal cords) rather than cerebral capacity for cognition. About forty years ago, there were successful attempts to teach apes a hand-based sign language, similar to **American Sign Language (ASL)** used by the deaf community. **Apes have also learned to communicate with humans** using special keyboards with large symbols, each one standing for a different object or verb (similar in concept to Chinese characters). Dolphins and whales have also been able to make symbol-based communication with humans. These other species may not have as large a vocabulary as humans of a comparable age, and they may make more grammatical errors, but their mastery of human language is more complicated than a parrot's who says "Polly wanna cracker" and is rewarded for that response with a cracker. Apes and dolphins learn the components of language and create new sentences that they have never heard.

I want the banana.

and

Look at the toy.

can be fused into a completely novel sentence.

I want the toy.

This is real cross-species communication indicating cognitive capacity in the speaker.

QUESTION #8.3: How do people reason?

Reasoning is the logical procedure by which an organism starts with one thing which is known, observed, or assumed, and then makes an inference about something else which is not itself directly known, observed, or assumed. Much of our reasoning is based upon our understanding of causation: the relationship between cause and effect. Do not confuse the word CAUSAL (which is an adjective relating to cause and effect) with the more common word CASUAL.

In the first chapter we introduced the concept of causal reasoning used by science. Sometimes we observe an effect, and infer a likely cause.

OBSERVATION <i>effect</i>	INFERENCE <i>cause</i>
The little girl is crying.	She fell and got hurt.

This process of reasoning from effect to cause requires that the cause be *essential* to produce the effect (that no other alternative cause could be inferred). If the girl could be crying for some other reason (e.g., she did not get her way with her brother), then we cannot conclude that falling down is the only (or even the most likely) explanation.

Sometimes we observe a cause, and infer a subsequent effect.

OBSERVATION <i>cause</i>	INFERENCE <i>effect</i>
That boy practices music every day.	He will become a famous musician some day.

This process of reasoning from cause to effect requires that the cause be *adequate* to produce the effect in question (that no other alternative outcome is possible). Practicing may be essential for a successful musical career, but it is not adequate: talent and luck are also needed.

<i>The Requirements of Causal Inference</i>		
	<i>To cause</i>	<i>To effect</i>
Cause is observed		Cause must be adequate
Effect is observed	Cause must be essential	

Causal reasoning is similar to process of deduction which uses conceptual categories depicted in syllogisms and Venn diagrams.

Deductive reasoning applies general rules to specific cases.

D E D U C T I V E

starts with the big principle and applies to many small cases just like

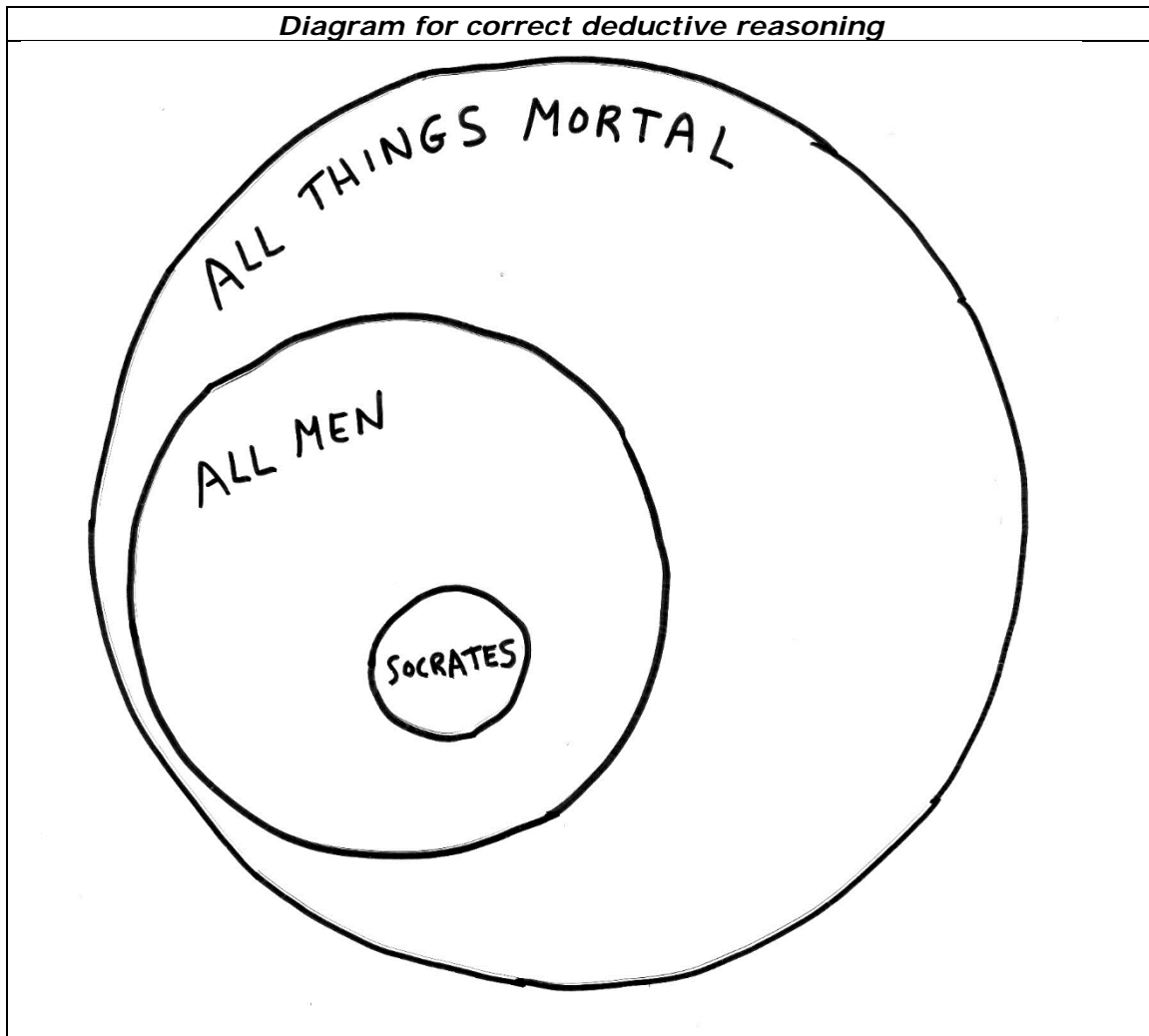
D E S T R U C T I V E

starts with one big thing and then breaks it up into many small pieces

The classic example of deductive reasoning was given by Socrates as he prepared himself for his forthcoming execution.

<i>Deductive reasoning leading to correct conclusion</i>	
"All men are mortal"	Major premise
"Socrates is a man"	Minor premise
"Socrates is mortal"	Conclusion

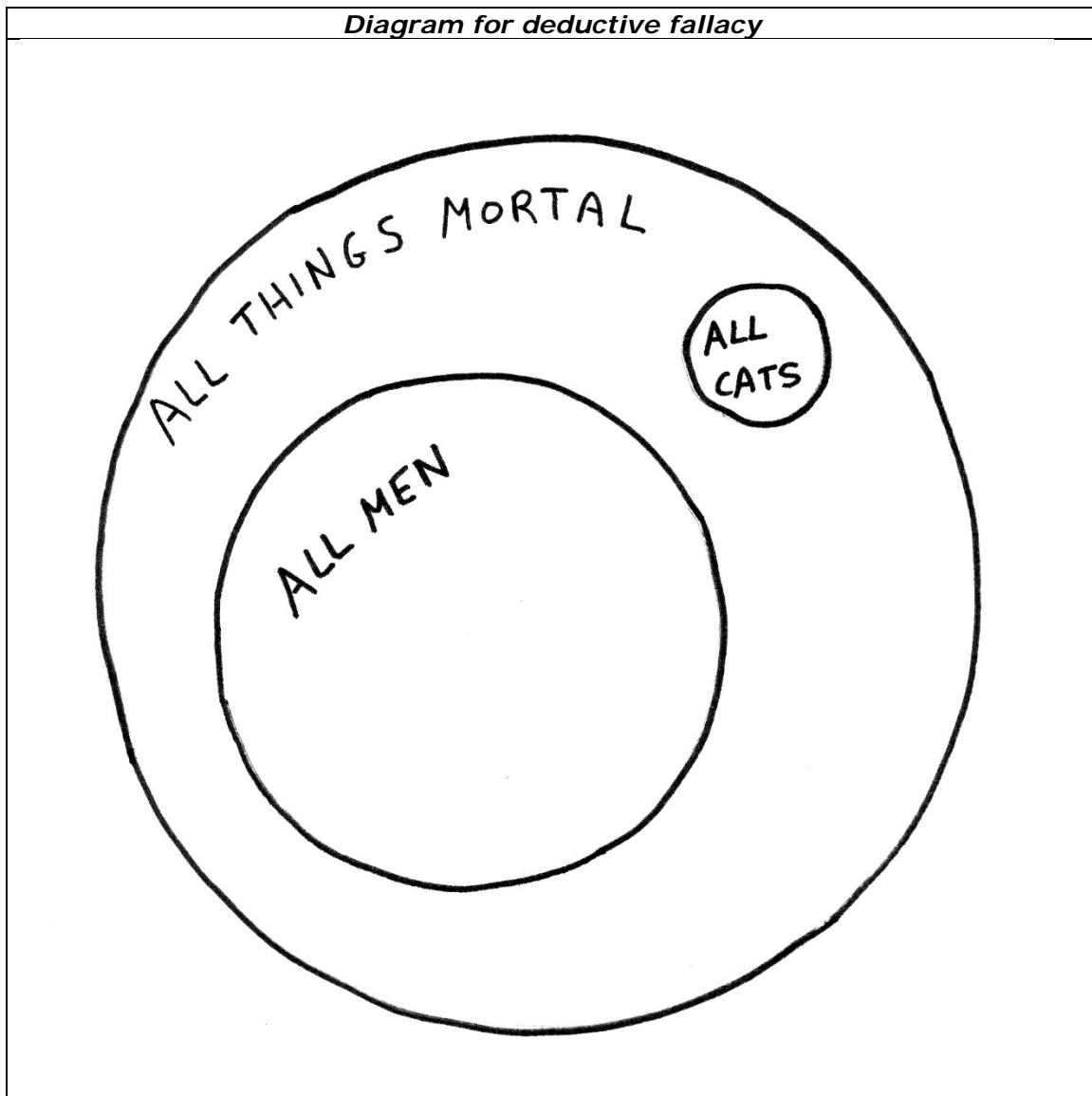
This can be viewed in the concentric circles of an Euler Circle. If all members of the category of men are in the larger category of things mortal, and Socrates is in the category of men, then the conclusion is visually obvious: Socrates is also in the larger category of things mortal.



The most frequent fallacy associated with deductive reasoning is to invert the minor premise and conclusion, as in the following example.

<i>Deductive reasoning leading to incorrect conclusion</i>	
"All men are mortal"	Major premise
"My cat is mortal"	Minor premise
"My cat is a man"	Conclusion

The circular diagrams help us visualize the fallacy.



Correct conclusion: you don't have to be a man in order to be mortal. Since other things are also mortal, you cannot deduce that something is a man just because it is mortal.

Causal fallacies can be portrayed in terms of such syllogisms and diagrams. Practicing may be an essential cause to achieve success as a musician, but it is not an adequate cause.

<i>Deductive reasoning leading to incorrect conclusion</i>	
"All great musicians practice"	Major premise
"This boy practices"	Minor premise
"He will become a great musician"	Conclusion

The diagram helps us visualize the fallacy.



Correct conclusion: we do not know if this particular boy will end up in the smaller circle of great musicians. Indeed, the majority of people who practice their instruments do not end up as famous musicians.

Deductive reasoning is used in the areas of mathematics, philosophy, theology, and statute law, wherever we can start the process with a few general rules or definitions that have been given.

Inductive reasoning starts with observed cases (specific examples) and then attempts to infer general rules.

INDUCTIVE start with INDIVIDUAL CASES

Here is how inductive reasoning would address the Socratic question of human mortality.

<i>Inductive reasoning leading to generalization</i>	
Mr. A, a man, died.	1 st example
Mr. B, a man, died.	2 nd example
Mr. C, a man, died.	3 rd example
Mr. D, a man, died.	4 th example
"All men are mortal"	Conclusion

The scientific method is inductive: we start empirically, with observed data. Scientific truth is probabilistic rather than absolutely certain (therefore, we express the level of significance with a p value).

Fallacies are flawed (but sometimes convincing) attempts at reasoning. In inductive reasoning, fallacies can come from either of two sources. The first is the question of the sufficiency of our number of examples. Is the conclusion warranted after just making four observations? Forty would be better, and four hundred better still. Within the science of psychology, this translates into the question of sample size. The larger the sample size, the better our level of statistical significance.

The second vulnerability of inductive reasoning relates to the typicality of the cases examined. Were all of these men condemned criminals awaiting execution? Perhaps the conclusion may only apply to a smaller, more clearly defined category. Within the science of psychology, this translates into the question of the **representativeness** of the sample. The more representative a sample is of a population, the more confident we can be that the same trend observed in the sample can be assumed in the population.

Confirmation bias is one problem that impairs inductive reasoning in many individuals. **Confirmation bias** occurs when a person only looks for (or notices) examples that fit an emerging conclusion. If I look in the newspaper obituaries each morning and see many examples of men in their fifties who die from heart attacks, I might conclude that all (or most) men in their fifties die of a heart attack. What is not in the

newspaper each morning is all the men in their fifties who did *not* die from a heart attack the previous day.

When students go into nursing homes to do research, they easily find old, dementia patients and may readily conclude that most elders develop dementia. Each additional patient examined tends to confirm that hypothesis, but the students tend to ignore the other nursing home patients who do not suffer from dementia and all the other elders (90 percent of the population over age 65) who are not sick enough to be in nursing homes. So, confirmation bias is comparable to the problem of non-representative sampling.

<i>Most dementia patients are old, but most old people do not have dementia</i>				
		VARIABLE TWO: dementia		
		Yes	No	totals
V A R I A B L E O N E	Over age 65	20	180	200
	Under age 65	5	795	800
Totals		25	975	N = 1000

Tversky and Kahneman referred to a related problem of the **availability heuristic**. When we are asked to think of something, we over-estimate those things that have examples that readily come to mind. When Americans travel abroad they are much more frightened about the risk of dying in a terrorist attack than they are of getting run over crossing a street. Many more tourists are killed in traffic accidents than are killed by terrorists, but terrorist attacks make news, so those instances more readily come to mind.

Imagine that John is a 17-year-old African American. He is a good student, and was admitted to a prestigious private university. He is also a good basketball player, and was awarded an athletic scholarship. A dozen years from now, is it more likely that John will be a professional basketball player or a surgeon? People might be fooled by the availability heuristic because it is so easy to think of African American basketball players: a majority of the NBA rosters. African Americans are less than ten percent of America's doctors, and many people may not have personally known an African American physician. However, there are only a few hundred players in the entire NBA, while there are thousands of African-American physicians. It is much more

likely that John will end up a surgeon than a pro-basketball player, but where he finally ends up will depend upon his unique combination of talent, motivation, and opportunities.

Tversky and Kahneman also studied another factor impairing thinking, anchoring. This is similar to illusions being due to expectation.

Anchoring is where a question or problem is presented with an initial reference point that distorts the subject's estimate. Even when the subject knows that the anchoring reference point is inflated, that serves to have the subject adjust upward (or downward) his own estimate. Flea market vendors understand this and frequently have very high initial asking prices. Most of the buyers will decline the initial price, but the larger the initial asking price, the higher the buyer's initial counter offer. The asking price was the anchor that set the standard for the buyer's own attempt at valuing the item.

Complex problems can be approached with algorithms or heuristics. The **algorithm is a structured, rigid approach that guarantees the right answer** if it is followed. Suppose you were not close to a calculator or computer, and were asked the square root of 500. The algorithm would be that old paper and pencil formula that looks something like long division. It will take a while, but it will get you the right answer.

A **heuristic** is a rule of thumb that might give a quick estimate. A heuristic approach to the above problem would be to say, the square root of 400 is 20, so somewhere around 22 ought to be the square root of 500. Multiply it out and you are close: 484. Now, if we had taken every number down to the hundredths place and squared it to see how close we could get to 500, that would be another algorithm, structured and slow, but guaranteed to get the right answer. For many problems, there are no algorithms, so heuristics are all we have to go with.

Today, problem solving using algorithms can be assigned to computers to systematically explore every possible solution much more quickly than a human could do. This kind of **problem solving by computers** is also known as **artificial intelligence**.

QUESTION #8.4: How should intelligence tests be used?

Intelligence is defined as a generic aptitude for cognitive learning. An **aptitude** is an innate ability to do something, prior to having had any specific training. Clearly, individuals do differ in terms of their capacity to demonstrate specific skills, and psychology can develop reliable and valid tests to measure those *specific* skills. The big question as it relates to intelligence is: can psychologists develop a valid, reliable, and cross culturally fair test for the measurement of a *generic* aptitude for learning?

In practice, **the operational definition of intelligence is IQ test scores.** The first IQ test was developed in 1904 by Alfred **Binet** in France. His purpose was to develop a technique for predicting which children would do well in school. Binet and subsequent research has shown moderate, positive correlations between scores on IQ tests and grades in elementary school, just as scores on (so called scholastic

apptitude tests) SATs have a moderate, positive correlation with college grades.

The Binet test was modified for use with American children at Stanford by the work of Edward Terman and Lillian Martin. The resulting **Stanford-Binet is scored by looking at the subject's raw score (the number of right answers), and then assigning a mental age equivalent MA, and then dividing by the actual (chronological age) CA, and then multiplying by a hundred.**

$$IQ = (\text{mental age} / \text{chronological age}) \times 100$$

Suppose children at these different ages have these average raw scores.

<i>Hypothetical age norms for a children's IQ test</i>	
AGE	AVERAGE RAW SCORE
4	16
5	23
6	27

Now let's imagine three different five year olds and see how they would be scored. The first little girl is slightly below average, not but retarded. Although she is five, she only got 16 right, which is what the average four-year-old can do, so she had a mental age equivalent of four. Her IQ is 80, somewhat below average, but still within the normal range.

$$IQ = \frac{MA}{CA} \times 100 = \frac{4}{5} \times 100 = 80$$

The next little boy is an average performer. He got a raw score of 23, which is right at the average for his age norm. So his mental age equivalent and chronological age are both 5. His IQ is the same as the **average IQ: 100.**

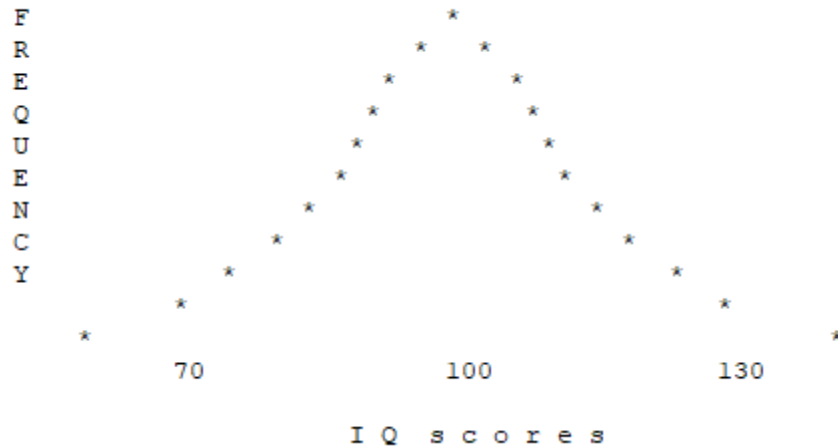
$$IQ = \frac{MA}{CA} \times 100 = \frac{5}{5} \times 100 = 100$$

The last little girl is an above average performer (but not a genius). She obtained a raw score of 27, which is what the average six-year-old can do.

$$IQ = \frac{MA}{CA} \times 100 = \frac{6}{5} \times 100 = 120$$

In general, the Stanford-Binet is used as a children's test, and if it is given to someone older than 15, the denominator is set at 15 because performance does not improve that much in the years after.

Wechsler developed separate IQ tests for children and adults: **WISC (Wechsler Intelligence Scale for Children)** and **WAIS (Wechsler Adult Intelligence Scale)**. The Wechsler tests are scored according to bell curve norms of a mean (and median and mode) of 100 and a standard deviation of 15. In practice, children tend to get similar scores on the Stanford-Binet and the WISC, for their similarities outweigh their differences.



Other tests of cognitive aptitudes include those which many practitioners regard as particularly useful in assessing school-related problems, such as the Kaufman Assessment Battery for Children (K-ABC) and Woodcock-Johnson.

Both heredity and environment seem to impact IQ. The best evidence that heredity is important comes from studies of identical twins. Even in cases of twins reared apart, if one twin scores high, so does the other; and if one twin scores low, so does the other. Evidence for the importance of the environment come from experiments that attempt to provide intellectually enriched environments for young children. This can also raise IQ performance by a few points. Studies on the IQs of adopted children indicate that they have low to moderate correlations with the IQs of the biological parents, and similar low to moderate correlations with the IQs of the adopting parents. The conclusion is that both heredity and environment matter.

IQ tests are very reliable, much more reliable than other types of psychological tests: personality, attitude, or mood. Here it is important to remember the definition of **reliability**: consistency of scores. One form of reliability is test/retest, referring to the long term stability of scores. Most children's IQ scores stay around the same range year after year. If we were to give all the students in class an IQ test today, and then wait for twenty years, and give the same test again, the correlation would be high: the same people who scored high today, would be the ones scoring high in twenty years, and the same people who score low today would be scoring low in twenty years. There would be very few exceptions to the trend, perhaps a few

students who developed Alzheimer's disease would have greatly reduced scores.

Other forms of reliability generally show the consistency of IQ test scores. Both the Wechsler and Stanford-Binet scores have slightly varied alternate forms. When subjects take both versions, the same people who score low on one test tend to score low on the other and the same ones who score high on one test tend to score high on the other. Inter-rater reliability is less of a problem in the more objective area of IQ testing than it would be in terms of clinical diagnoses or job interviews. Most subjects will score pretty much the same regardless of who administers and scores the test. The one exception to this generalization may be children from ethnic minority or disadvantaged backgrounds, and these subjects may do better with an examiner with whom they can be comfortable: one from their own background.

The validity of IQ tests is questionable. If **validity** is understood as a test measuring what it purports to measure, then it may be impossible to ever validate IQ tests. Many specific items (and the overall test taking procedures) may be influenced by past learning, and therefore not measure an aptitude for new learning. Indeed, some items may deal more with memory or perception than cognition.

Over sixty years ago, Charles **Spearman** argued that there was one generic cognitive aptitude (which he termed the *g* factor) underlying all measurable cognitive performance. Many psychologists now doubt that there is one, generic form of intelligence. **Robert Sternberg** suggested that intelligence had a **triarchic** dimensionality, with componential (analytic), contextual (practical), and experiential (creative) aspects. **Howard Gardner** pointed out a related limitation of IQ tests: at best they measure a limited range of mental abilities (e.g., mostly math, verbal) rather than a broad, generic aptitude. Gardner suggested that individuals may have many different kinds of aptitudes (e.g., kinesthetic) which are not being measured by standardized IQ tests. Gardner's theory is known as **multiple intelligences**.

Most IQ tests lack cross cultural fairness. While the average IQ of middle class white children is about 100, it is about 90 for Hispanics, Native Americans, and African Americans. These ethnic differences are best accounted for by socio-economic, educational, and cultural differences. By measuring what has been learned, IQ test items may lack cross cultural fairness.

Let's take this example of an item cross culturally fair to someone raised in Mexico. *On what day is the revolution celebrated?* Of course, if you were raised in Mexico, you know the answer, because the schools teach it, and they are closed that day, along with government offices, and there are parades in the streets, and politicians make speeches about the glories of the revolution. The problem with the cross cultural fairness of this item is that it is more than just remembering a specific date (indeed, your first guess was probably May 5, but that is wrong). The deeper problem is that we need to have an entire cognitive map with connections to other events and aspects of culture. In the U.S., the American Revolution is celebrated on July 4, the date of the Declaration of Independence from England. So, if you go to a history book and read about May 5, you will discover that was the

Battle of Puebla in 1862 when the Mexican Republic forces of Benito Juarez fought against the French, but the independence from Spain was declared back in 1810 on September 15, but that is not the correct date of the Mexican revolution either. The U.S. cognitive map of *Revolution = Independence* does not hold in Mexico. In the U.S., the Civil War occurred when Americans fought Americans north vs. south 1861-1865. In Mexico, their great civil war started in 1910, when Madero and Villa and Zapata fought against old dictator Porfirio Diaz, and that civil war is known as the Mexican Revolution, and it began in Ciudad Juarez on November 20. (But now the government celebrates Revolution Day on the third Monday in November.)

When cross culturally unfair IQ tests are used to track children into pre-college or manual arts, the result is that such tests become tools for the perpetuation of racial and social class discrimination.

Case Study: Dr. F was born in 1921, seventh child of nine. His parents were Mexican immigrants who had come to California to harvest agricultural crops. Both parents were only marginally literate in Spanish, and spoke very little English. Their home had few books or writing materials. The children would often join their parents in the picking fields during harvest time. On the basis of his low IQ scores, a school counselor advised Mr. F to take vocational classes and hope for a job where he could better himself as a carpenter or mechanic. After serving in the U.S. Army during World War II, Mr. F took advantage of the GI bill and attended Los Angeles Community College, which he followed by attending Cal State Los Angeles, where he earned a bachelor's degree, and then he became a school counselor. He later returned to UCLA where he earned a master's and doctorate, and became a professor of educational counseling. Fortunately, Dr. F had the courage to defy the track upon which he had been placed by cross culturally biased tests.

Another example of IQ test fairness relates to age or historical differences. Many IQ test items of today may be inappropriate for elders. A Fairness of Geriatric Intelligence Examination might have to use an entirely different set of items.

Fairness of Geriatric Intelligence Exam

F.O.G.I.E.

1. *Who was funny?*
 - a. Jack Benny
 - b. Valentino
 - c. Tom Dewey
 - d. Bruno Hauptmann

2. *How many before a skiddoo?*
 - a. 18
 - b. 23
 - c. 55
 - d. 60
 - e. 62
 - d. 65

3. *Johnny called for Phillip*
 - a. Collins
 - b. Morris
 - c. Harris
 - d. Prince of England

4. *What is in the center of a Bingo card?*
 - a. 00
 - b. XX
 - c. N
 - d. 13
 - e. \$\$
 - f. FREE

5. *On what day of the week did December 7, 1941, fall?*
 - a. Sunday
 - b. Thursday
 - c. Friday
 - d. Saturday

ANSWERS: Jack Benny was a radio comedian of the 1940s. 23-skiddoo is a popular saying from the 1920s and 1930s. Johnny called for Phillip Morris in a famous cigarette commercial. FREE is in the center of a bingo card. Sunday, December 7, 1941, was a day that lives in infamy because of Pearl Harbor, a flashbulb memory for the older generation. Of course, these items are not cross culturally fair to someone who did not live in American culture in the first half of the 20th century, and the validity of these items can be challenged: they measure what has been learned, not a capacity to learn.

The normal range of IQ is 70-130. The average (mean, median and mode) IQ score is 100. Within two standard deviations of that score fall about 95% of the population. Three percent of adults have IQs below 70, and only two percent have IQs above 130. Those who score at the extremes also run the risk of receiving labels.

Retardation refers to an IQ score below 70. Older terms would be moron (mildly retarded), imbecile (moderately retarded), and idiot (severely retarded), amentia, mental subnormality. Newer terms for these individuals would be **developmentally disabled** or **intellectually challenged**. Over five million American adults fall into these categories, but most of them are only in the mild range. They can get through public school and can work at jobs that do not exceed their abilities. Indeed, retarded workers tend to be more attentive on tasks

that workers of average intelligence might find boring and repetitive. Such individuals can live independent, productive lives outside of institutions. The moderately retarded may require employment in sheltered workshops and living in group homes. Only the most severely retarded will require complete institutional care.

Retardation can be caused by a variety of factors. Only a small percent is due to heredity obtained from retarded parents. The vast majority of retarded individuals had two parents who were in the normal range of intelligence. Chromosomal abnormalities, intra-uterine exposure to a virus or toxic chemicals, early childhood malnutrition can all produce retardation. Although retardation may be more likely in poorer families, it can occur in any family.

Case Study: Ms. K was born in 1919, right after the great flu pandemic. She was the third of nine children. She was slow to learn and her behavior was unusual. Her father was a self-made financier. Her mother was the daughter of the mayor of Boston. Her sisters did well in school, and her brothers, Joe Junior, Jack, Robert and Edward, had stellar careers, but when she was twenty, Rosemary Kennedy was placed in an institution because her family was having problems taking care of her at home.

An idiot savant is a rare individual who tests in the retarded range but nevertheless has amazing mental abilities (e.g., memory, calculating, artistic, mechanical). Remember the case of Mr. J introduced in chapter four.

Case Study: When Mr. J was a young boy in Mexico, he was shot in the head. The small caliber bullet entered his left hemisphere at about the hairline, and exited just above the occipital lobe. Before the accident, he attended school and was a very good student in reading, writing, and arithmetic. After the accident, he was unable to read or write, use a digital watch, or perform the simplest calculations. He was certifiably retarded, but he had some amazing mental abilities. He could look at a person, and paint the portrait several days later. He could take apart and reassemble just about any mechanical device. He could hang a punching bag from a tree with a series of ropes and pulleys so that its motion would simulate that of a live opponent.

The above case reiterates what Howard Gardner said about IQ tests. Mr. J was retarded because the bullet destroyed his left brain aptitudes, the math and language abilities measured by the IQ tests. His right brain artistic and mechanical abilities remained intact. (It is important not to infer from this case that the damage to the left side could have stimulated the development of his right brain abilities. Mr. J's father and several brothers demonstrated amazing right brain abilities as well, so it may be an inherited family trait.)

A genius is a person who scores above 130 on an IQ test. Another popular term used would be **gifted**. Only about two percent score this high on IQ tests: usually 130 is used as the cutoff score. These

individuals also must deal with stereotypes, ranging from excessive expectations of academic and professional achievement, to the stereotypes that they are socially inept, athletically uncoordinated, and prone to mental illness. The Terman longitudinal study at Stanford started looking at super high IQ children back in the 1920s and followed them through the different stages of life. Contrary to popular stereotypes about the gifted, these children were not rated as being lower than average in their physical attractiveness, social popularity, athletic prowess, or mental health. On each of these variables, some individuals scored higher and others lower. Their overall educational achievements were quite high, and the men ended up in careers such as medicine, law, science, and education. Two-thirds of these high IQ women ended up choosing one career (homemaker), typical of the choice made by their average IQ cohorts of the 1950s.

Most individuals, whether normal, retarded, or genius, will not benefit from being told their IQ labels.

Case Study: Mr. H was born in 1953 in Chicago. At age 7 he was told by his father, "You got it made, kid! Remember that long test you took at school last month? You got the highest score of any kid in the Catholic School system of the city." Young Mr. H then coasted through high school and a private university with a 3.8 GPA. He never decided to get a graduate degree. He held a series of high school teaching positions interspersed with stints as a composer and singer.

Rather than try to come up with one aptitude test that purports to measure an all-encompassing generic aptitude, a better approach would be to assess students' specific strengths and weaknesses. The strengths can be used to select students for specific programs (art, music, and sports, as well as math and language) in order to develop these innate talents. The discovery of specific learning disabilities can target students for specific interventions and remediations designed to correct these limitations.

QUESTION #8.5: What is creativity?

Creativity is divergent problem solving. **Convergent** problem solving is when there is only one possible answer (like on most IQ test items).

Divergent problem solving means that several solutions are possible (but some might be better than others). Most real world problems call for divergent solutions.

<i>Situations calling for divergent problem solving</i>
What is the best way to control air pollution?
Which product should our company manufacture now?
What is the best way to advertise our product?
How can I get my kid to stop . . . ?

A creative solution has to meet two criteria. It must be feasible (it must solve the problem), as well as being original.

Criteria for Creativity			
		SOLUTION IS ORIGINAL	
		Yes	No
F E A S I B L E	Yes	CREATIVE	PRACTICAL
	No	IMAGINATIVE	TRIVIAL

It is quite difficult to develop paper and pencil tests to measure creativity. Not all creativity comes forth with a paper and pencil. Consider the limitations of this test item.

Draw a picture of how people will dress in a hundred years.

Unlike "objective" tests (e.g., IQ) which presumably have one and only one answer, divergent problem solving necessarily permits many possible answers, so we might have to get a panel of judges to evaluate the subjects' answers for both originality and feasibility.

Reliability would be a problem. Since we use judges, we would have to look at inter-rater reliability. If the judges came from different backgrounds (e.g., a scientist, fashion designer, graphic artist) they might emphasize different criteria in their judgments, and disagree. Test/retest reliability would be another consideration. Indeed, we would not even expect creative individuals to come up with the same design if given the problem again. With a different design, the subject might get a different score.

Validity would be a problem. How could we verify that the test item is actually measuring creativity? What is the established measure of creativity with which we could correlate these test scores? How could we be assured that this test is not really measuring some other variable, such as fashion consciousness or drawing ability?

Cross cultural fairness is another problem. Fashion differs greatly according to culture. If the subjects taking the test and the judges scoring the test came from different cultures, they may have different standards on clothing, as well as different notions of what is feasible and original in the area of dress.

Creativity proceeds in stages. Different writers and researchers on creativity may use different words to describe these stages, and they may even disagree about how many stages there are, but they do agree that creativity proceeds in stages. One commonly used set of stages would be orientation, preparation, incubation, illumination, and verification. It is not important to memorize these stages, because other books might have more or fewer stages, but it is important to remember that creativity proceeds in stages.

Orientation is the initial approach to a problem, how it is understood, framed, and defined. This stage is where the originality of the individual is important. Creative people understand an old problem in a new way and end up with a new solution.

Preparation is the next stage. This refers to getting the necessary information on the problem and potential solutions. If preparation is not adequate, a feasible solution is not likely.

The incubation stage may be the longest of the stages. The individual must put the problem on the back burners of the mind and allow it to simmer, simmer, until ...

Illumination is when the little light bulb comes on and the inventor says "Eureka!" I have it. This is the original insight that suggests the new solution.

Verification is the last stage, and involves testing out the new solution, making sure that it is actually feasible.

Think of these stages of creativity, not as a linear path that guarantees success, but as a cycle that must be gone through many times. To be truly creative, the inventor must go back to step one, the orientation stage, otherwise he will merely come up with minor improvements on the last idea. For example, take the problem of air pollution in southern California.

<i>Example of the creative process in search of a solution</i>	
1. orientation	The problem is that people are breathing polluted air.
2. preparation	Get information on lungs, toxins, asphyxiation, etc.
3. incubation	Think about and visualize the problem, consider different aspects
4. illumination	Aha!! Let's have people in southern California wear gas masks.
5. verification	We try this, and find that people consider it to be inconvenient.
<i>So, it's back to the old drawing board</i>	

So we have to go through the stages again, but if we start with the same orientation, we will just come up with a more popular version of the gas mask. We should go back to the first step, orientation.

<i>Example of the creative process in search of a solution</i>	
1. orientation	The problem is that the air is being polluted in the first place.
2. preparation	Get information on vehicle exhaust, smokestacks, etc.
3. incubation	Think about and visualize the problem, consider different aspects
4. illumination	Aha!! Let's have mass transit in southern California.
5. verification	We try this, and find that people consider it to be inconvenient.
<i>So, it's back to the old drawing board</i>	

We might need a few more times through this cycle for this problem.

Creative individuals have a personality profile of independence, originality, good use of reasoning, persistence, flexibility, tolerance, and are knowledgeable. The independence, tolerance, and originality are necessary for the orientation and illumination stages. The knowledge is important in the preparation. Good reasoning is required for the verification stage. The flexibility and persistence is necessary to go through the stages again if the first solution fails to pass verification.

These individual traits are rare, and even more rare is their combination. There may be some inherited component, but there are also things that parents can do to provide an early childhood environment conducive to creativity. The above personality traits can be thought of as virtues or habits that can be modeled and reinforced.

Creativity can be hurt by the lack of any of the above, and also by situational factors, such as functional fixedness and a rigid mental set. **Functional fixedness refers to using the same tool for the same purpose over and over.** Creativity relies upon finding new uses for the familiar. Alexander Graham Bell was trying to develop a hearing aid, and then he realized that the wires could be made much longer, and then he had a telephone. He became a creative inventor by overcoming his functional fixedness.

Habitual (rigid) mental set is probably the greatest stumbling block to creative problem solving. **Rigidity of set is orienting oneself to the problem in the same way, over and over again.** It is important to [reframe](#) what the problem really is and what the solution really requires. There are many advertisements that imply their products are creative because "they have broken the rules." The important thing about creative solutions is not breaking the rules, but to re-examine which rules we really need to follow and which become irrelevant to a reframed problem.

Consider the case of the Willis Tower in Chicago. When it was designed in 1973 as America's tallest building, it had the fastest elevators running the most efficient schedule, but as soon as the building was occupied, there was an internal traffic jam at quitting time. Workers were complaining about waiting several minutes for an elevator to take them down to the ground floor where the parking structures and public

transportation could be found. The Sears executives called in some consultants and clarified one major priority: "This is our corporate headquarters. We don't want to change the work schedule: everyone still gets off at five."

When most students hear this problem they come up with solutions that are trivial (make more elevator shafts by sacrificing office space) or imaginative (e.g., give the workers parachutes). All of these solutions show the habitual rigid set of defining the problem as people moving. The engineering company that came up with a creative solution went back to the orientation stage and redefined the problem by focusing on the sentence "Workers were complaining about waiting several minutes ... " The solution which they tried was mirrors. The mirrors gave the workers something to look at while they waited for the elevator to come.

Creativity can be helped by training thinkers to go through the stages and spend a proper amount of time at each stage. Creative thinking can also be performed in a group context, but leadership is required. The leader must make sure that the members of the group keep moving through the various stages.

QUESTION #8.6: How should we make decisions?

Even after good reasoning has defined our problem, and creativity has come up with several viable solutions, we must then choose which course of action to take. People, and even groups, do not always make the best decisions.

Most opportunities for making a decision are not even recognized and seized. In the majority of occasions, we simply employ a previously selected solution for a similar problem. Most people don't think about making a choice of which route to take to work today. They have developed a routine, a habit, and tend to use it unless they have some reason for change. When it comes to purchasing products, going shopping for groceries, or booking a flight, most people demonstrate brand loyalty: they stick with the same product, usually because it has served them well in the past. Rather than view routine behavior as a form of habitual set, it might be better to say that people are trying to use their decision making resources more efficiently. "If it ain't broke, don't fix it." Their dedication to a certain route for getting to work, or shopping at a certain grocery store has been based upon past experiences, and careful reasoning. Unless something major changes in their own priorities, or in the ability of that brand to meet those priorities, the subjects will continue to meet their priorities by sticking to that brand.

ROUTINE BEHAVIOR Act as if the decision has already been made by past deliberations; follow an established habit.

Example: have bought Crest toothpaste for 20 years

Advantage: saves time of comparison shopping

Disadvantage: miss out on new alternatives that may be superior

External referral is another cautious way to make decisions. The individual decision maker "passes the buck" or "follows the book." This may be the wisest strategy when it is important to get the approval of someone else.

EXTERNAL REFERRAL Refer the decision to an external authority: a boss, rule book, parent, religious leader, etc.

Example: asking boss if it is alright to grant a customer's request

Advantage: protects one from the wrath of powerful persons or social traditions

Disadvantage: slow (we may have to wait for the boss to get back to us).

Intentional randomization appears to be another way to avoid making a decision, but it may have some merits. Drawing straws, flipping a coin, or using a lottery makes the outcome very unpredictable to possible opponents, and has the appearance of being fair if someone ends up being a loser.

INTENTIONAL RANDOMIZATION Refer the decision to a coin flip or lottery.

Example(s): drawing straws to determine who will get the last piece of candy; flipping a coin to choose an offensive plan during the last play of the football game

Advantage: protects one from the wrath of losers; makes decisions unpredictable by opponents

Disadvantage: the prize may be given to the least deserving; the course of action selected may have the worst prospects

Affect means emotion, and some people make big decisions by impulse or emotion. The decision is made by the individual, but not by utilizing any of the types of reasoning we have discussed.

AFFECT REFERRAL Act on the emotional impulse of the moment.

Example(s): marrying a handsome, charming man because you are "in love"; giving money to a beggar out of pity; ordering a fattening dessert

Advantage: instantaneously alleviates current emotional pressures

Disadvantage: the course of action selected may have the worst long term prospects

A more rational approach is the lexicographic, which identifies a specific criterion against which all possible alternatives will be objectively evaluated.

LEXICOGRAPHIC Identify one key criterion. Select the best alternative for meeting that criterion.

Example: buying gasoline at the station which has the cheapest price

Advantage: identifies the most important need and meets that need

Disadvantage: other important criteria are not considered

The British mathematician **Bayes** developed a complicated approach for dealing with multiple criteria. Therefore, it is also known as the compensatory model, because effectiveness in meeting certain criteria can compensate for deficiencies on meeting other criteria. Specific weightings are given for different criteria, and then we estimate how well each possible alternative meets each of these criteria. We then multiply these scores by the weights, and add up the products to get the total expected value for each alternative.

Case Study: Let's go back and revisit that street dog chasing a jogger, but now the jogger is stopping and making a throwing motion. Perhaps this dog is very cognitive, and has come up with two alternative courses of action: continue the chase or run away. The dog identifies his priorities: the satisfaction of the chase versus the pain of getting hit with a rock. He calculates that the probability of getting hit with the rock is much higher if he continues the chase. He weights

the criterion of avoiding pain as much more important than the satisfaction of the chase, so he decides to turn and run away.

BAYESIAN Identify multiple criteria. Weight each criterion. Assess ability of each alternative to meet each criterion. Multiply ABILITY X WEIGHT, total up the value of each alternative.

Example: choosing a vacation which will give you the most chances to ski, surf, and sightsee.

Advantage: identifies all relevant criteria and selects the alternative which best MAXIMIZES GAIN

Disadvantage: time consuming, difficult to quantify some weights and abilities, some criteria may not have linear proportionality of benefits (e.g., skiing 16 hours a day is not twice as fun as skiing 8 hours a day).

A more cautious approach for dealing with multiple criteria would be the **conjunctive**. (This approach is sometimes called the elimination-by-aspects or multiple hurdles.) Here we view each criterion as a different hurdle that each alternative must clear if it is to be selected. What we are left with is the alternative that at least **minimally satisfies all criteria**. We may not be selecting the alternative with the maximum potential for gain, but we will get the alternative with the minimum overall risk.

CONJUNCTIVE Identify multiple criteria. Establish minimum score on each criterion. Eliminate those alternatives which fail to meet the minimum score.

Example: buying a house which will be large enough, close enough to work, and within your budget

Advantage: identifies all relevant criteria and selects the alternative which best MINIMIZES RISK

Disadvantage: time consuming, difficult to quantify some cutoffs and scores

The conjunctive approach is similar to the **satisficing** approach developed by Nobel Prize winning economist Herbert **Simon**. When people are looking for a solution (especially when the solutions are presented sequentially over a long period of time rather than all at once) people tend to accept the first minimally satisfactory solution presented, and then view the problem as solved.

Case Study: Mr. P, 44, is the owner of a growing freight company. His business has outgrown its existing warehouse. Rather than buy a new one, or expand the size of his present warehouse, Mr. P has decided that the best thing to do in his current local real estate market is to buy an existing warehouse. He has just started looking around for alternatives. He has three main criteria: size, location, and cost. He rejected the first warehouse that the real estate agent brought to his attention (too far away), but the next alternative looks acceptable on all three counts. Rather than wait and see if another alternative presents itself over the next few months, he has decided to satisfice with this one.

Case Study: Mr. K, 34, is at the stage of life when he is ready to settle down, get married, and start a family. He had one brief prior marriage in his 20s, out of pure infatuation, but he has resolved that this marriage will be based upon the right foundation (and then the emotion of love will come later). His criteria are few: the prospective bride must be Jewish (observant), educated, and desire children. He went to a "speed dating" seminar organized at his synagogue. In one evening, he met over a dozen young women interested in getting married. He was able to rapidly learn who was insufficiently religious and indecisive about having children. Mr. K has one candidate who clearly satisfies his criteria, and will be courting her. If that relationship no longer appears viable, Mr. K is not interested in dating any other candidates.

Case Study: Mr. A, 53, is a street beggar in a large U.S. city. His major decision is what kind of begging behavior to emit. He has three main approaches: a sign offering to work for food, a sign saying that he is a homeless Vietnam veteran, or to bring a dog. He has two main criteria. The first is to get as much money as he can. The second is not to get any of the other beggars upset. Recently, he found that another beggar has been harassing those who (falsely) claim to be Vietnam veterans, so Mr. A has given up that strategy. Nobody seems to object to either of the other two alternatives, and since the dog seems to bring in more money, that is the strategy which Mr. A now employs.

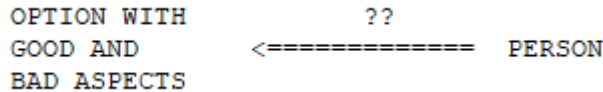
One additional use of the conjunctive approach is that it can be used to preserve harmony in a group of decision makers when each one of the subjects has a different priority. Essentially, we are giving each member of the group a veto over the final decision. For example, a married couple must choose where to go on their vacation: Denver, Lake Tahoe, or Hawaii. The husband's main criterion is good skiing: Denver is number one, but the other two are acceptable. His other criterion is keeping the cost down. That would eliminate Hawaii, but the other two are still OK. The wife's main criterion is having some romantic time together. She ranks Hawaii as ideal, Lake Tahoe as acceptable, and Denver as unacceptable. They use the conjunctive process to select Lake Tahoe. It was not the ideal choice of either, but it is an acceptable choice for both.

Kurt [Lewin](#) pointed out that decision making often produces **intra-
psychic conflict** for the decision maker. Some decisions are *yes/no* decisions on a specific alternative. There will be conflict if there is

an **ambivalence**, with the alternative having both favorable (approach) and unfavorable (avoidance) characteristics. Imagine that you have just gained admission to the University of Redlands. The approach factor is that it is a quality educational institution with a student friendly campus. The avoidance factor is that you gained admission but not financial aid.

AMBIVALENCE

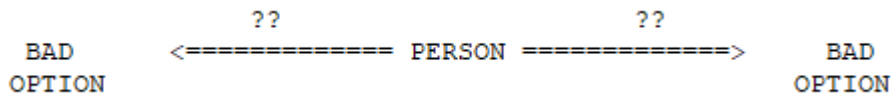
Decision to accept or reject an option with both good and bad aspects: ambivalence, a conjunctive choice in which both aspects must be accepted.



In choosing between two alternatives, Lewin noted that the most difficult was the avoidance-avoidance decision: a forced choice between two undesirable alternatives. Imagine that you wake up one morning with a tooth ache. You call the dentist only to find out that the corrective procedure will be expensive and it will not be covered by your insurance. You want to avoid the tooth ache, but you also want to avoid the cost, and you will not be successful in avoiding both. Whatever decision you make you will have some regrets.

AVOIDANCE - AVOIDANCE

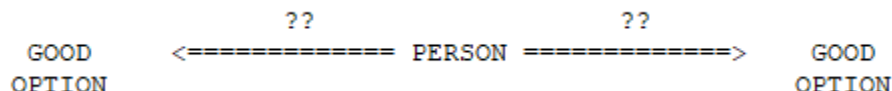
Decision between two bad options: avoidance - avoidance, a disjunctive choice in which either one of two bad things must be accepted.



Even when there is a choice between two desirable alternatives, Lewin pointed out that there would be some approach-approach frustration, because you cannot have both of them. Imagine that you have just been selected for a special study abroad program in Salamanca, Spain. You have been dreaming about this for years ever since your friend told you what a great time she had. You also get a job offer from ESRI, a company you have heard to be one of the best local employers. They need someone now and are not going to wait for you to get back from Spain. If you take the job, you have lost a once in a lifetime chance to study abroad. If you go to Spain, you may lose your only chance to get with that company.

APPROACH - APPROACH

Decision between two good options: approach - approach,
a disjunctive choice in which only one of two good things can be obtained.



Although we cannot get rid of such intra-psychic conflicts, we can make today's decisions so that tomorrow's decisions are more of the approach-approach variety, and less of the avoidance-avoidance variety.

Unfortunately, when people make the wrong decision, they sometimes stick with those decisions long past the point when it has become obvious that the wrong choice was made. This kind of **entrapment**, may involve an escalation of commitment, hoping that "If I can stand it just a little bit longer, things will turn around, it will all be worthwhile." Some investors will keep on pouring "good money after bad" in hopes that their investments will start going up and erase their previous losses. Some people who are married to violent or addicted spouses stay in the relationship, hoping against all evidence for a change, and their justification is "I have invested so many years of my life so far, I would hate to throw them away." Nations who have been engaged in a stalemated war continue fighting for the same reasons. In most cases, a wiser strategy is to cut losses, and admit that all those years invested with the hopeless spouse have already been thrown away, and that we need to focus on the years that remain.

A similar deficit in the decision making strategy of groups was studied by Irving **Janis**. He studied classic bad decisions such as Ford's decision to launch the Edsel in 1958, and the singular greatest foreign policy failure of the Kennedy administration, the Bay of Pigs invasion of Cuba in 1961. When Janis interviewed the members of the decision making teams responsible for those disasters, he kept hearing that they foresaw the probable failure of the suggested course of action. However, they perceived that the team had already invested so much time developing the proposal that any individual who stood up to speak out in opposition at that point in time would have been ridiculed by the **group think** which had prevailed. Another example would be the design of the Challenger Space Shuttle which exploded because of a design flaw which several engineers had worried about, but were unable to get the design committee to pay attention to.

Some of the solutions for more creativity and less group think coming out of committees would be to have the leader initially refrain from stating a preference. The large committee can be broken down into several smaller groups working independently for a while to see if they all select the same alternative. Individuals must be encouraged to take the role of devil's advocate and demonstrate how an alternative fails to pass the verification stage.

UNIT 9: EMOTION & MOTIVATION & STRESS

QUESTION #9.1: What is affect?

Affect (accent on the first syllable) is a noun that refers to **emotions, mood, feelings, values, preferences and priorities**. The adjective is affective (with emphasis on the second syllable). Do not confuse this word with other words that have a similar spelling, but different pronunciation.

Affect and similar words			
WORD	ACCENT ON	NOUN OR VERB	MEANING
Affect	First syllabus	Noun	Emotion, mood, feelings, values, goals, priorities
Affect	Second syllable	Verb	To influence
Effect	Second syllable	Noun	The result of a cause
Effect	Second syllable	Verb	To make something happen

Affect differs from cognition		
Noun	Affect	Cognition
<i>Adjective</i>	Affective	Cognitive
<i>Focus</i>	Feelings	Thoughts
<i>Process</i>	Emotion	Logic
<i>Tests measure</i>	Mood level	Mental ability
<i>Future is</i>	Preferences	Predictions
<i>Planning involves</i>	Ends	Means
<i>Formation of</i>	Commitments	Concepts

The most commonly identified emotions would be joy, sadness, fear and anger, though some researchers such as Robert **Plutchik** have suggested that there might be four more primary emotions, and then eight secondary or blended emotions.

We never really know what emotion another person is experiencing. We **infer** the emotional experience based upon what the person says or does. We observe the external behavior, then we infer the internal emotion.

OBSERVATION	INFERENCE
That woman is crying.	She is sad.
That man is yelling.	He is angry.
The dog has its tail between its legs.	It is frightened.
The dog is wagging its tail.	It is happy.
The cat is purring.	It is happy.

Sometimes people make the wrong inference about somebody else's emotion.

Case Study: Jack and Jill, both 19, have been dating for a few months. Tonight they are going on a drive to San Diego. The traffic is even slower than usual, and Jack seems even quieter than usual. He seems to be staring at the car's clock in the dashboard most of the time. His eyes are pinched and looks like he is frowning. Jill can stand it no longer: "I can't take it when you act this way, blaming me for the slow traffic and everything." Jack is now perplexed. He had no inkling that Jill was getting upset, and has no idea what she is upset about. He has been fully concentrating on his dashboard to check the oil pressure and engine temperature in this difficult drive. His facial expressions reflect that concern, not an emotion like anger. When Jack says that he does not know what she is talking about, Jill thinks that he is just trying to play mind games with her, so she demands to be taken home. Jack infers that Jill must have PMS. Her own inferences may have been influenced by the behaviors of some other people that she has known.

The gulf between what emotions others are actually experiencing, and what we infer that others are experiencing can be greater if there are historical or cultural divides. When we read a passage of scripture recorded two thousand years ago, and translated into English four hundred years ago, we must be cautious that the physical description of emotions may have changed. Different cultures may have developed different ways of expressing emotion, leading outsiders to misinterpret these expressions.

<i>Cross cultural differences in emotional expression</i>		
BEHAVIOR	U.S. CULTURE	OTHER CULTURE
Speaks in low voice	Subject is calm	Subject is angry (Navaho)
Spits in face	Subject is angry, showing disrespect	Older male shows respect for younger (Masai)
Clapping	Joy, applause	Welcome greeting (western China)
Thumbs up	Joy, approval	Crude insult (Europe)

The relationship between behavior and emotion has enabled many judges to infer if a suspect was lying. The assumption is that if the accused is lying, he will be fearful of being caught in the lie, and that fear translates into observable behaviors.

Some north African tribes would have trials in front of a chief. Each witness and the accused had to testify, and then stick out their tongues. The chief would say, "I have been heating this sword in the camp fire. If you have testified honestly you will be protected. If you have lied, your tongue will be burned." Then he touched the sword to the tongue of the witness who had just testified. This worked pretty well: those who lied worried about their tongues getting burned, and their mouths dried up, and their tongues were burned.

In northern India they used a "magic" donkey that they said could tell when a man lied. They would put the donkey and the accused into a small hut with no windows, close the door, and tell the accused to grab the donkey's tail so it could tell if the man lied, and let out a "hee haw." Then the judge would shout the questions and listen to the accused answer. When the accused finally left the hut, his hands would be examined. The donkey's tail had been smeared with soot, and if the accused had been afraid to grab the donkey's tail, the judge inferred that the accused had been lying.

<i>The validity of the polygraph</i>			
		Suspect is actually telling	
		<i>A lie</i>	<i>The truth</i>
P O L Y G R A P H	<i>Suspect shows high polygraph activity</i>	Right verdict	Honest person who just got worried about the process
	<i>Suspect shows low polygraph activity</i>	Hardened criminal or deluded person who beats the polygraph	Right verdict

Modern **lie detectors** work on the same principle: that someone who lies will be afraid, and that the fear leads to observable physical responses. **Polygraphs** measure respiration rate, heart rate, and galvanic skin response (perspiration) under the assumption that all of these will go up if the person experiences the fear of being caught lying. With a skilled operator, the polygraph is right most of the time (but not often enough to be admissible as evidence in most courts of law). Some hardened criminals beat the lie detector because they have had so much practice lying and getting away with it. Other people who are lying, but sincerely believe that they are telling the truth, can also beat the lie detector (such as individuals who claim to have been abducted by space aliens). The biggest problem with lie detectors are the false positives: honest people who are telling the truth, but who get so nervous that the machine will falsely accuse them, make the machine react, and then are falsely accused.

po LY graph

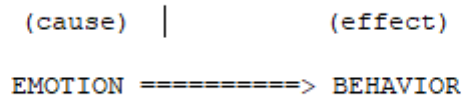
Lie (LY) is what is being seen, graphed.

Future research with brain scanning techniques may yield more valid and reliable correlates of lying. One area of the brain associated with memory may activate when the truth is being told, and another area associated with fantasy may activate when the subject is lying.

QUESTION #9.2: What causes emotions?

Emotions are definitely influenced by the brain (e.g., limbic system and frontal lobe). The causal relationship between emotion, thought and behavior has been long debated even before psychology became a science. The "common sense" approach is widely assumed, but not based upon systematic observation and empirically tested hypotheses. Most people assume that emotions are the cause of behavior.

"COMMON SENSE" EXPLANATION accepted by Freud

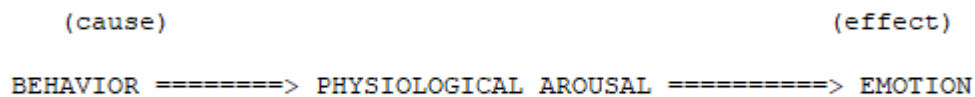


example: I felt angry (emotion), so I yelled at him (behavior).

As we shall see, this is not very different from **Freud's** psychoanalytic theory that behavior is motivated by sexual and aggressive drives.

In 1884 **William James** challenged the common sense approach, arguing that **emotion is the result of** behavior: we are sad because we cry, we are happy because we laugh, we are angry because we are yelling. Later endorsed by a Danish physiologist, Lange, the **James-Lange** theory identifies **physiological arousal** as the key factor that generates and sustains the experience of emotions.

JAMES - LANGE THEORY OF EMOTIONS



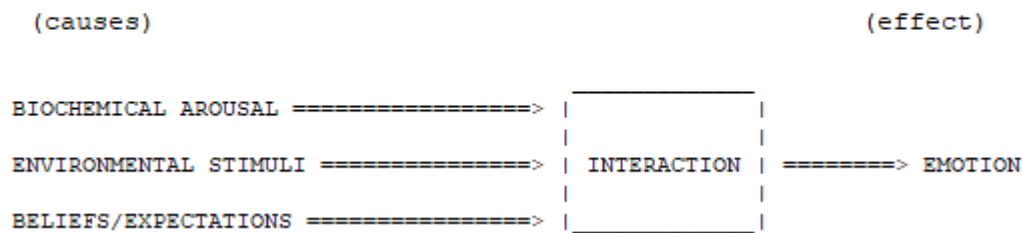
example: I yelled at him (behavior), which really got my adrenaline pumped up (physiological arousal), and this intensified my anger (emotion).

The **cognitive theory of emotion** is the leading contemporary approach, holding that our interpretations and expectations play a major role in generating and sustaining our emotional experiences. **Schachter** and his colleagues performed a series of experiments on college students, attempting to discover which factors had an impact. They verified that putting people into frustrating situations, or having someone else model an emotion could intensify the emotional experiences reported by the students. When physiological arousal was induced by an injection of norepinephrine (which activated the **sympathetic nervous system**) emotions also intensified. The cognitive aspect of the resulting theory was based upon a finding that what the subjects believed about their

injections also influenced the emotional intensity. In one round of experiments, all of the subjects were injected with norepinephrine, but half were intentionally misinformed that their injection was actually a vitamin. It was these subjects who had the most intense emotional experience. When they noticed their hearts accelerate and their faces flush, they reasoned that this could not be the result of the vitamin injection, so it must be a very intense emotion.

Research on Cognitive labeling of emotions	
<i>Researcher(s)</i>	Schachter and Singer
<i>Subjects</i>	College students
<i>Type of research</i>	Experiment
<i>Independent Variable</i>	What subjects were told that they had been injected with
<i>Factors held Constant</i>	All students got the same injection
<i>Dependent Variable</i>	The emotional experience reported by the students
<i>Results</i>	Students who did not know that they had received norepinephrine reported more emotional intensity (anger or happiness)
<i>Ethical Considerations</i>	Students were temporarily deceived about the injections they had been given
<i>Conclusion</i>	Expectations influence emotional intensity

SCHACHTER's COGNITIVE LABELING THEORY OF EMOTION



Imagine yourself in the following situation: you go down to the post office to send a package. It is close to 5:00 PM and you are expecting the lines to be long and the counter employees to be tired and slow. You take a number, wait for five minutes, and then you are at the window. Then you stop off at the grocery store to get a quart of milk, cereal, bananas and cat food. You go to the express check out line, where you expect to go right through. The people in front of you include a lady who wants to write a check and record the amount, a man who asks for a rare pack of cigarettes that the clerk has to get from a locked case, and someone else who wants to get extra cash back with his ATM card. When you finally get to the clerk, you are angry and tell

her so "This is an express line, and you should not let customers pay with ATM cards and checks, and you should not close the register to run off and look for cigarettes or anything else. I have been waiting in this line for five minutes!" A five-minute wait at the post office was a relief, because you expected to wait more, but a five-minute wait in the express check out line was intolerable because you expected less.

STIMULUS	ORGANISM	RESPONSE
= waiting in =	= customer =	= customer is =
= line for 5 =	= expecting =	= relieved, =
= minutes at =	= to wait =	= almost =
= post office =	= 20 minutes =	= joyful =

STIMULUS	ORGANISM	RESPONSE
= waiting in =	= customer =	= customer is =
= line for 5 =	= expecting =	= angry and =
= minutes in =	= to wait =	= complains to =
= express line =	= 2 minutes =	= the clerk =

QUESTION #9.3: What are motives?

A motive is something within the organism which excites the organism to action, especially when certain external stimuli are also presented to the organism. This is related to drives. A drive is the aroused internal condition of the organism. When a motive is activated, the drive condition is high. An incentive is an external reinforcer that has the ability to satisfy the drive, and thereby lower the internal level of excitation. An instrumental response is a specific behavior that is capable of attaining the incentive. Here are some examples of motives with their respective drives, incentives and instrumental responses. This model of motivation is known as **drive reduction theory**.

<i>Relationship of motives, drives, incentives, and response</i>			
Motive	HUNGER	THIRST	OXYGEN
Drive	Being hungry	Being thirsty	Out of breath
Incentive	Food	Liquid	Air
Instrumental Response	Eating	Drinking	Breathing

Do not confuse motive or drive (or intuition) with instinct. Only use the term instinct when speaking of a behavior that meets certain criteria: **instincts are complex behaviors that are rigidly patterned, inherited, and found in all members of a species**. Nest building behavior in birds would be an example of an instinct because it meets all four of the criteria.

Nest building behavior in birds is an instinct	
<i>Complex behavior</i>	Yes
<i>Rigidly patterned</i>	Yes, birds do not alter nests to suit changes in climate.
<i>Inherited</i>	Yes, birds do not have to go to a school to learn how to build nests.
<i>Species wide</i>	Yes, all robins do it one way; all swallows do it a different way.

	Origin of the behavior	
	<i>Inherited</i>	<i>Learned</i>
<i>Complex</i>	<p>TRUE INSTINCTS</p> <p>Rigidly patterned & species-wide</p>	<p>Modeled</p> <p>Cognitively learned</p> <p>Chain conditioned</p>
<i>Simple</i>	Inherited reflexes	Conditioned reflexes

Instincts are a greater source of behaviors for lower species, and less important with a highly developed cerebrum. Humans have few, if any real instincts. Many behaviors presumed to be instinctive in humans actually fail to meet one or more of the criteria. Some are just simple reflexes.

Eye blink is a simple reflex, not an instinct	
<i>Complex behavior</i>	No, a simple reflex
<i>Rigidly patterned</i>	Yes
<i>Inherited</i>	Yes
<i>Species wide</i>	Yes

Other behaviors permit too much situational variation to qualify as an instinct.

Survival behavior is not an instinct, but a varied strategy	
<i>Complex behavior</i>	Yes
<i>Rigidly patterned</i>	No, people can appraise the situation and try a variety of things to survive
<i>Inherited</i>	Yes
<i>Species wide</i>	Yes (ignoring the rare cases of suicide and altruistic sacrifice of life)

For motives to be studied scientifically, we must come up with **operational definitions** specifying how the variable is to be measured in research. We can simply ask people if they are hungry or thirsty, but especially when it comes to animals, we infer the strength of the drive by observing how much of the incentive the animal consumes, which incentive the animal chooses, roaming behavior, effort to get around barriers, and resistance to extinction during non-reinforcement.

OBSERVATION	INFERENCE
Cat drank a lot.	Cat was thirsty.
Cat went to water bowl before food bowl.	Cat was thirsty.
Male cat is roaming farther from home.	It must be mating season.
Female dog digs under the fence every few months.	Dog has come into heat.
Rat keeps pressing bar even though the food dispenser is not working.	Rat is very hungry.

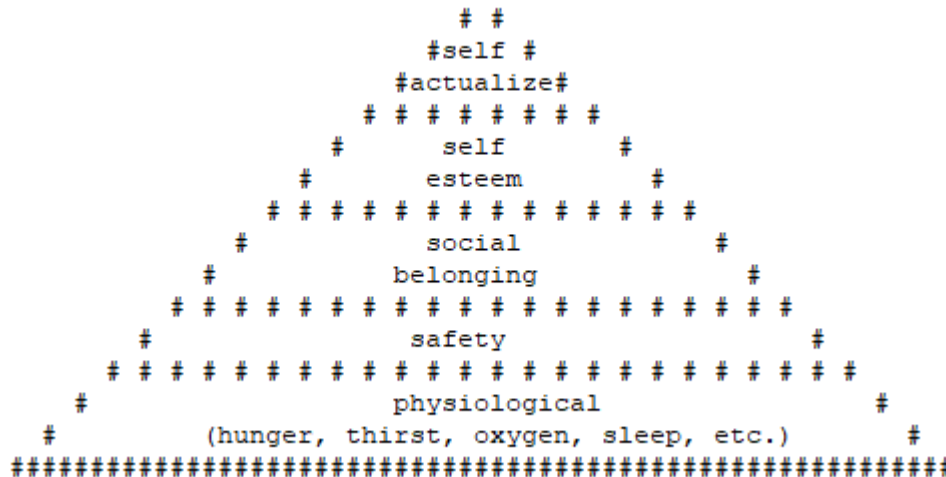
There are several ways of categorizing motives. **Physiological motives are primary** because they are based upon the body's need for survival. Primary motives **include hunger, thirst, sleep, oxygen, temperature maintenance, elimination, and pain avoidance.**

Stimulus motives are based in the fact that humans have such a highly developed cerebrum that they need to interact with the physical environment: explore, manipulate, and master it. These would include such things as **curiosity, intellectual activity, and the need for entertainment.**

Secondary motives are learned, but they can be powerful also. In many societies and families, the most powerful motives are associated with **acceptance by the group.** Individuals raised under these norms will be reluctant to do anything that sets them apart from their group. In North American middle class culture **individual achievement** has become a powerful, learned motive for many individuals. Of course, different people may define achievement in different ways. No matter how powerful the motive, it is still called *secondary* if it is learned.

<i>Types of motives</i>		
	<i>Unlearned</i>	<i>Learned</i>
<i>Based in Body</i>	PRIMARY Sleep Thirst Hunger Oxygen Elimination Temperature	
<i>Based in Cerebral Cortex</i>	STIMULUS Mastery Excitement Exploration	SECONDARY Approval Acceptance Achievement

Abraham **Maslow** developed a model of a **pyramidal hierarchy** for relating the relative priorities of these different motives (or needs as he called them). Notice that [Maslow](#) also agrees that it is the primary, **physiological needs that have priority**. They must be met first, before the individual can go on to the higher levels of needs.



Sometimes operant conditioning can reduce the importance of other, more intrinsic motives, a situation known as **overjustification**.

Case Study: Jane, age 8, loved to play chess. Her parents were very proud of her accomplishments, and entered her in some tournaments. To get her to practice more, they mistakenly thought it wise to reinforce her with candy for playing practice games of chess. After awhile, Jane became so concerned about getting her candy that she enjoyed playing

chess less and less. When her parents stopped reinforcing her, she completely gave up the game.

QUESTION #9.4: What is homeostasis?

Homeostasis is the term describing a physiological steady state, an equilibrium in which something is kept at just the right level, not too low and not too high. Homeostasis is a noun, and the corresponding adjective is homeostatic. **Physiological motives** (with the exception of pain) have their own homeostatic mechanisms. When it comes to the need for temperature maintenance at 98.6 degrees Fahrenheit (37 degrees Celsius), the homeostatic mechanism is that going much below that level causes the body to shiver to generate heat, while going much above that level causes the body to perspire to cool itself down.

The **hypothalamus** is the part of the brain that contains the body's homeostatic mechanisms for **hunger and thirst**. One part of the hypothalamus (the lateral) initiates eating behavior, and another part (the ventromedial) indicates satiety, ending eating behavior. A lesion on the first hypothalamic center means that the organism loses the desire to eat. A lesion on the latter hypothalamic center means that the organism will not know when to stop eating, leading to **hyperphagia**: nearly constant eating behavior and a great gain in weight.

It is doubtful that this concept of homeostasis can be applied to much beyond the physiological motives, or even to human sexual behavior.

QUESTION #9.5: What causes eating disorders in people?

The three main eating disorders in the U.S, today are obesity, anorexia, and bulimia. All are more prevalent today than they were forty years ago, and all of them are more prevalent in the U.S. than in other countries.

Obesity is being extremely overweight, not just pleasingly plump. Estimates differ about what percent of Americans are overweight, or about how fat is too fat. Most human obesity cannot be explained as hyperphagia due to hypothalamic lesions. A genetic predisposition might explain why some people are more likely to be stockier, or why fat kids tend to have fat parents, but this is not the whole story. Americans, particularly overweight individuals, have developed unhealthy dietary habits: too much grease, too much sugar, too much salt, large portions, frequent snacking, and way too many calories. Perhaps more importantly, we have been conditioned to think we should eat (and so we feel hungry) when the clock says it is time to eat, or when we pass a McDonald's, or when we are at a party, or when we are watching a movie in a theater, or watching the Superbowl.

STIMULUS	ORGANISM	RESPONSE
=	=	=
= going away	=	= must try
= party for a	= office	= all the
= coworker	= worker	= different
=	=	= cakes there

STIMULUS	ORGANISM	RESPONSE
=	=	=
= movie in a	=	= drinks
= theater	= moviegoer	= coke and
=	=	= eats buttered
=	=	= popcorn

STIMULUS	ORGANISM	RESPONSE
=	=	=
= superbowl	=	= drinks
=	= fan	= beer and
=	=	= eats chips
=	=	= with dip

The average American college freshman living in a dormitory gains a pound a week in her first semester because late night studying is associated with pizza and potato chips.

Perhaps the biggest reason why Americans are overweight today is the sedentary life style. Fifty years ago, more people were engaged in manual labor and walked to work. Today, a majority of Americans still do not engage in vigorous daily exercise. Worse yet, many Californians will get in the car and drive two blocks to the store, and reward themselves with a slurpee. Many American tourists in Europe are amazed that although they are eating so much rich food, and missing their regular workouts at the gym, they are losing weight because of all that walking around.

What is most unfortunate is that the increasing levels of obesity have come at a time when we have simultaneously set up a ridiculously slender figure as the ideal of feminine beauty. Four hundred years ago, the Dutch masters painted beautiful women in the nude who would be considered flabby by contemporary standards. The term "Rubenesque figure" is now a euphemism for fat. Even the film stars of the 1950s (e.g., Marilyn Monroe, Jane Russell) would be considered overweight by contemporary standards. This fixation with thinness equaling beauty results in the fact that about two-thirds of American women think that

they should be trying to lose weight. The traditional Mexican norm for feminine beauty was a full figured woman.

Case Study: Gloria and her sister, Ruth, were born in a small Mexican village. Both girls left while in their teens and headed for Mexico City. Ruth married a dairy farmer, worked all day with cream and butter, and had four children. She now weighs about 200 pounds. Gloria went to the U.S., married a successful businessman, and adopted the American norm of "slender is beautiful," spending much of her day working out in the gym, maintaining a slim 100-pound figure. Then, about twenty years later, the two women were spending Christmas in Mexico together, and decided on a whim to go back to their old village. As they came up the dusty pathway, they saw an old neighbor who recognized both the girls. Putting her arm around the larger girl, the old woman muttered, "Ruth, you are still the most beautiful girl to come out of Tlatlaya." Then she hugged the slender sister, "Gloria, we heard about you, marrying that Gringo. What is the matter? Doesn't he feed you enough?"

In Northamerican culture, being fat is also stereotyped with traits such as being lazy and socially inept, so it should not be surprising that there is job discrimination against people of larger girth: they are less likely to be hired and less likely to be promoted.

STIMULUS	ORGANISM	RESPONSE
=	=	= infers that =
= applicant	=	= applicant is =
= who is	= employer	= lazy; decides =
= overweight	=	= not to hire =
=	=	= her =

The warped feminine ideal of beauty and the real job discrimination faced by the overweight has caused many women to become fat phobic. They so much fear being overweight that they will try any kind of diet. When they fall back under the sway of the old habits of unhealthy eating and lack of exercise, they suffer a blow to self esteem as well. Those women who do succeed in their diets run another risk. The social reinforcement they receive as they become thinner can lead to compulsive dieting, beyond the point of what is necessary or healthful.

STIMULUS	ORGANISM	RESPONSE
= clothes are	=	= she further =
= now loose,	=	= restricts =
= friends say	= woman	= food intake =
= how great	= dieter	= and loses =
= she looks	=	= more weight =

Anorexia nervosa is a psychiatric condition in which the individual obsesses about being overweight, and **compulsively diets** to a level that is physically dangerous. Over 90 percent of anorexics are female, mostly adolescents and young women. Anorexia and bulimia were rare fifty years ago, but now anorexia affects about ten percent of young women, and bulimia about five percent. These rates are higher among cheerleaders, ballet dancers, and women in college dormitories. Unfortunately, these disorders are also spreading abroad, as the American ideal of slender beauty has become part of globalized culture. Even in the Mexico, the more modern cities like Toluca have special clinics for weight loss, and now, special clinics for eating disorders like anorexia and bulimia.

Hospitalization is sometimes necessary to deal with medical complications and to stabilize eating behavior. Long term success usually requires family therapy and ongoing group therapy.

DISORDER: anorexia nervosa

CLASSIFICATION: eating disorder

PREVALENCE: up to ten per cent, more prevalent among women under 30

SYMPTOMS: delusions of being fat, compulsive dieting leading to substantial weight loss

AGE OF ONSET: usually in adolescence

CAUSES: societal norms of feminine beauty, dysfunctional families, compulsive personality, comorbidity with depression

TREATMENT: cognitive-behavior therapy, group therapy, family therapy

Case Study: Ms. T, age 13, was the youngest in a family of three daughters. One older sister had been a teenage model, the other had been a homecoming queen. Ms. T herself was more athletic, a good soccer player with a more muscular, stocky build. When she gave up soccer at twelve, and went through puberty, she put on about ten pounds. Her sisters and even her parents began to kid her about this, even calling her "Miss Piggy." She began to diet, and lost the weight, and started to receive the praise of her family and friends, but kept on dieting and losing weight, until it became dangerous and she was hospitalized.

She was released after five weeks, but when her father was picking her up, he asked the staff "I am glad that she has this starvation thing out of her head, but tell me, is she going to get fat again?" The prognosis was not good.

Bulimia is a slightly different eating disorder in which the individual may have food binges (e.g., peanut butter or ice cream) but then **self-induce vomiting**.

DISORDER: bulimia nervosa

CLASSIFICATION: eating disorder

PREVALENCE: one to five per cent, more prevalent among women under 30

SYMPTOMS: obsessive concern with weight, compulsive bingeing and purging

AGE OF ONSET: usually in adolescence

CAUSES: societal norms of feminine beauty, dysfunctional families, compulsive personality, comorbidity with depression

TREATMENT: cognitive-behavior therapy, group therapy, family therapy

QUESTION #9.6: What is sex?

There are several understandings of a person's sex: genetic, genital, gonadal, hormonal, identity and orientation.

Genetic sex refers to the chromosomal pattern in every cell in the person's body: XX in the female, XY in the male. These chromosomal differences may account for other inherited differences, such as color blindness being more prevalent in males.

Genital sex refers to the external sex organs: the penis in the male, and the vagina and clitoris in the female. Hermaphroditism is when individuals are born with genitals of both sexes, an extremely rare condition also known as **intersexed**.

Gonadal sex refers to the "internal" sex organs that are associated with fertility: ovaries in the female, testes in the male.

Hormonal sex refers to chemical levels: estrogens in the female and androgens (e.g., **testosterone**) in the male. These hormones not only influence sexual response and fertility, but also secondary sexual characteristics such as breast development in the female and facial hair in the male. Hormones can also influence mood level. About ten percent of women experience intense mood swings just before the onset of menstruation, a syndrome known as pre-menstrual syndrome, **PMS**.

Gender identity refers to a person's social and psychological sense of being a male or a female. This is usually fairly well established by the time the child is four or five: boys and girls know that there are differences between them, and most children are comfortable being what they are. In the past, when female roles were more constrained (e.g., "little girls had to wear dresses and avoid rough play") some girls delayed their assumption of feminine roles for a few years, and were known as "tomboys."

Gender identity disorder is a rare condition in which an individual is dissatisfied with physiological gender. The patient (usually a male) feels as if he is a woman trapped inside of a man's body. Some respond well to counseling, and develop a male gender identity to match their four physiological markers of gender. However, when counseling fails, some individuals opt for a medical treatment of sexual reassignment, becoming a transgender individual.

The first step is that the patient will start to dress and act like a woman in public. (This is not to be confused with **transvestism, a sexual fetish in which males dress up like women** temporarily, often just in private, in order to achieve sexual stimulation.) The next step would be to take female hormones and develop some secondary sexual characteristics (e.g., breast development). The next step is the biggest: surgery to remove the male genitals and gonads, and then the surgeon fashions a female vagina and clitoris. (It is even a more difficult procedure when going from female to male, fashioning a working penis.) The male to female **transgender** individual is now female in genitals, hormones, and identity (and some governments may issue new identity papers such as birth certificate or driver license). However, this person now has no gonads, and can neither sire nor conceive nor bear a child. Genetically, the XY male pattern remains in every cell.

Do not confuse sexual identity disorder with homosexuality. Heterosexual, homosexual, and bisexual are **sexual orientations**, also known as sexual preference (whom the individual is attracted to).

Heterosexuals are exclusively attracted to members of the opposite sex, and are clearly the majority of the population. **Homosexuals** (gay men and **lesbian** women) are exclusively attracted to members of their own sex, and may be as rare as two percent of the population. **Bisexuality** is the capacity to find some attraction to either sex, even though the individual might be more attracted to one or the other. Many, perhaps most, individuals who refer to themselves as homosexuals are actually bisexuals, having had some experience in heterosexual relationships.

Case Study: Mr. E, now in his late 40s, was the youngest child of a farm family. Tall, handsome, intelligent, and with a pleasant personality, he was very popular in school. At age 19 he got his girlfriend pregnant. They married, he finished college, and took over the family farm, greatly expanding its operations. About five years into the marriage, he announced that he and his wife were divorcing, which totally shocked the other family members because Mr. E and his wife got along so well, and he was a great father. She remarried within a couple of years, but he never married or even dated. He has had a long term relationship with another man. Mr. E has "come out" to some of his family members, including his son. Although he could be classified as a bisexual, Mr. E was more comfortable in his homosexual orientation, and views his early heterosexual experience as due to adolescent confusion and denial of his homosexual orientation.

The cause of homosexuality is much debated. There is not much evidence to support the view that a "sissified" home environment results in a boy becoming gay or that tomboys become lesbians. There is probably a genetic or congenital factor creating a difference in the limbic system, influencing sexual arousal.

Environment may have a role in homosexual behavior. While sexual orientation may be present at birth, the decision to engage in sexual activity is influenced by what a society permits, models, and reinforces. No society has ever completely suppressed homosexual (or heterosexual) behavior, but the heavy sanctions imposed in medieval Christendom or under Taliban Afghanistan might reduce such behavior. On the other hand, when homosexual behavior becomes more of a norm (e.g., in certain prisons and boarding schools) some individuals with mild bisexual tendencies might engage in homosexual acts when they would not do so otherwise. In ancient Athens, homosexual relationships were widely practiced, and many men acted bisexually (having sexual contact with male buddies as well as wives, girl friends, mistresses, etc.)

Freud and other early psychiatrists considered homosexuality to be a mental disorder. Back in the 1940s and 1950s many homosexuals spent years in therapy trying to change their sexual orientation. Although many reported that the therapy had been helpful in improving their self-esteem and coping with depression and anxiety, very few became heterosexuals.

Case Study: Mr. W, now age 77, was born in a small Midwestern town. He says that he always felt different. When puberty hit, he felt a powerful attraction to other boys, but fought against these urges believing that they were sinful temptations. When he became 18 he moved to San Francisco, and got into the homosexual scene. During a severe depression he attempted suicide and was hospitalized. In 1956 he admitted his orientation to his parents: more of a confession than a coming out. They offered to pay for psychoanalysis, and he agreed to it, still viewing his orientation as something sinful or sick. After four years the depression had lifted, and the suicidal impulses were gone, but he remained homosexual, only better adjusted.

In the 1970s both the American Psychological Association and the American Psychiatric Association declared that homosexuality should no longer be viewed as a mental disorder, but as a sexual orientation. Since that time, psychotherapists have come to consider homosexuals as a special population (like immigrants) who may have greater vulnerabilities to certain mental disorders or requiring certain special considerations in treatment.

Homophobia literally means fear of homosexuality. In a broader sense, it refers to **stereotypes about and discrimination against homosexuals**.

The concept of homeostasis does not apply to human sexual behavior. Homeostasis applies to the primary physiological motives necessary for the body's survival (e.g., hunger, thirst, oxygen) and sexual activity is not necessary for survival. People can survive long periods of sexual abstinence (although they may not like abstaining). No one ever died from lack of sex. Although sexual behavior is rooted in the physiology, it is also influenced greatly by other motives: stimulus and learned. So, **human sexuality is non-homeostatic**.

Modern psychology has a part in the medical treatment of sexual dysfunctions. Such dysfunctions include male problems as **impotence (male erectile disorder)**, and premature ejaculation, as well as female problems such as frigidity (a lack of erotic response by the female) and vaginismus (female muscle spasms preventing intercourse). Most of these sexual dysfunctions are like phobias that have been classically conditioned, and can be treated with some of the psychotherapy and behavior modification discussed in chapter 11.

Psychology can also help by encouraging responsible sexual behavior: supporting individuals in their decisions to abstain from sexual activity, practice safer sex with condoms, and use family planning to avoid unwanted pregnancy. Psychology can also help to identify, understand, and control dangerous sexual perversions such as rape and child molestation.

QUESTION #9.7: What is stress?

Stress is defined as excessive environmental demands for adaptation. It can be thought of as too much stimulation. Any kind of change in the environment (even good events like getting married, moving into a new home, or getting a promotion) can be stressful because they are demands for change. Perhaps the most stressful situations are those that frustrate our motives, especially when these events were unanticipated.

General Adaptation Syndrome is where stress leads to physiological problems.

Bereavement is the reaction that individuals have to unexpected and devastating losses and frustrations. The greatest forms of bereavement are constituted by the untimely death of a loved one (losing your child or spouse). Anticipation and appropriate timing can reduce the feelings of stress and bereavement. When patients suffering from Alzheimer's Disease or cancer finally die, their loved ones may experience a relief that the patient's suffering (and a great source of their own stress) is now over. Much more stressful is to get a call from the hospital

that there has been an accident, or that someone has had a heart attack, when there was no expectation of the event.

One possible outcome to stress, especially frustration, is aggression.

Aggression is defined as any action designed to harm another. This includes, but is not limited to violent actions, for insulting words and gossip are other ways of hurting another. Most violent acts by animals have some obvious means-end purpose, such as getting food or a mate. Human violence may be used for these purposes, but much of it is a simple irrational response to extreme frustration.

STIMULUS	ORGANISM	RESPONSE
=	=	=
= stress at	=	= mass killing
= work	=> worker	=> of co-workers
=	=	=
=	=	=

In the last two decades there has been a rash of workplace and school shootings. Several of these occurred at post offices, so the phrase "going postal" came to mean that one was becoming so stressed out that one would start shooting co-workers.

Case Study: Mr. T, age 15, was small for his age. He was poor at sports and unpopular. Since grade school he was the butt of jokes by larger boys, especially athletes. One day he brought his father's loaded revolver to his gym class, and got it out of the bag, but before he could discharge it, he was wrestled to the floor. He had written in his diary that he would teach the jocks a lesson that day.

STIMULUS	ORGANISM	RESPONSE
=	=	=
= being	=	= mass killing
= bullied	=> student	=> of students
= at school	=	=
=	=	=

Stress can lead to physical illness, especially those that are known as **psychophysiologic (psychosomatic)**. These are **real physical illnesses** and may require medical intervention through medication or even surgery, but the fact is that these disorders can be **exacerbated by exposure to stress**. Migraine headaches, asthma, skin rashes can often be psychosomatic. Perhaps half of all American adults have some physical condition that is in part exacerbated by stress. In addition to medical intervention, many forms of psychosomatic disorders can be helped by psychotherapy, behavior modification, biofeedback, or by the simple reduction of stress in the patient's life.

STIMULUS	ORGANISM	RESPONSE
=	=	=
=	=	=
= stressful	= worker	= migraine
= job	=	= headache
=	=	=

Case Study: Ms. C, now 77, was the only daughter, the youngest child in a large farm family. She recalls her parents as being strict and cold. Her mother was sickly, suffering from migraine headaches, but still remarkably hard working. Ms. C was a plain, homely girl, or so her parents told her. She did hard physical work on the farm, as well as the housework and cooking, and later while in high school, she took over keeping the books for the farm business. She started having migraines during her senior year in high school. She married at age 20 and moved away with her husband to another state. She did secretarial and bookkeeping work, usually putting in much overtime "doing the work of three girls" her boss bragged. When the workload got exceptionally heavy, or when her husband (a self-centered man) complained that she did not have enough time to give to him, the migraine headaches came back. They persisted until age 64, when she retired from a stressful job as corporate secretary for a conglomerate. She has not had a migraine since the day of her retirement.

Do not confuse psychosomatic diseases with hypochondriasis. A **hypochondriac is a patient who has no real physical disease** (or who greatly exaggerates the degree of suffering or limitation due to a real physical disease). Hypochondriacs obsess about being ill and compulsively seek medical attention. When the physician reports back that there is nothing physically wrong, the patient greets this with disbelief and rage. The frequency of the hypochondriac's complaints may wax and wane with depression or stress, but the underlying hypochondriacal personality was conditioned in early childhood.

<i>Interaction of mind and body</i>		
	Symptoms are	
	<i>Real</i>	<i>Imaginary</i>
<i>Cause is largely organic</i>	Most physical illness	Schizophrenic Hallucinations
<i>Cause includes some reaction to stress</i>	Psychosomatic Hypertension Migraines Some skin rashes	Hyphochondriacal delusions

Case Study: Mr. S, now in his early 50s, was an only child. One morning when he was about 7, he thought about how scary it was going to be at school that day. A bully wanted his milk money. S felt the butterflies in his stomach, and told his mother that he was sick. She told him he should stay home from school that day. She wheeled the family room TV into his bedroom so that he could watch it from bed. She gave him a special flavor of ice cream that she had heard would "settle his stomach" and at the end of the day, she gave him a new toy as a get well gift. Whenever Mr. S felt worried about school, or work, or some social responsibility, he would feel sick, and escape from those responsibilities. Mr. S was reinforced both negatively and positively for his sickly behavior.

NEGATIVE REINFORCEMENT OF HYPOCHONDRIAC

<i>(organism)</i>	<i>(aversive stimulus)</i>	<i>(escape response)</i>	<i>(termination of aversive stimulus)</i>
Mr. S	-----> bully at school	----> acts sick	-----> avoids the bully

POSITIVE REINFORCEMENT OF HYPOCHONDRIAC

<i>(organism)</i> <i>(active)</i>	<i>(response)</i> <i>(emitted)</i>	<i>(reinforcement)</i> <i>(primary positive)</i>
Mr. S	-----> ACTS SICK	-----> GETS ICE CREAM AND TOY

QUESTION #9.8: What is catharsis?

Catharsis refers to a purifying release of pent up emotions. Freud must be credited with developing the theoretical framework for understanding the therapeutic value of abreaction, as he called catharsis. A basic assumption is that emotions (especially anger and sadness) can be stored up like so many marbles in a sack, or so much steam in a kettle. If too much emotional pressure builds up, the vessel may become stretched out of shape, spring a leak, or completely rupture. The abreaction obtained during therapy serves to discharge excessive tension and return emotional pressure to tolerable levels.

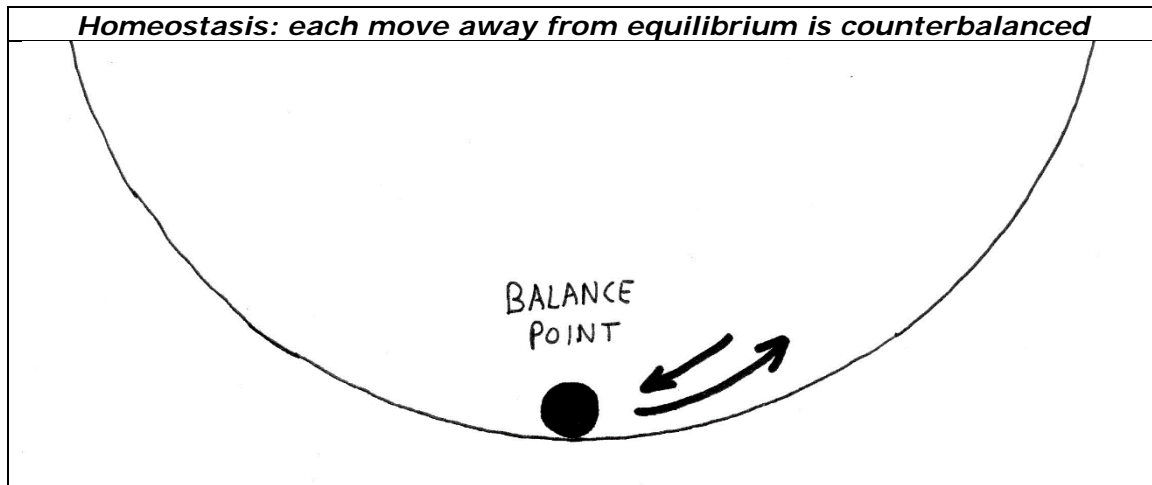
HOMEOSTASIS: tendency to maintain a steady state of balance and equilibrium.

ADVOCATE: Sigmund Freud

EMOTIONS: assumes that emotions store up if not released, then reach dangerous levels and explode. The expression of anger reduces the accumulation of anger.

ANALOGIES: steam in a kettle, water in a balloon, marbles in a sack

BALL METAPHOR: Imagine a ball in the bottom of a soup bowl. Any external movement to the bowl may temporarily jar the ball up one of the sides, but the force of gravity will cause the ball to come down and resume its place of equilibrium at lower levels in the bottom of the bowl.



Although the homeostatic understanding of catharsis has persisted on the popular level, it always had its opponents within academic and professional psychology, starting way back with **William James**, who argued that **people who allow themselves to get angry do not discharge pent up anger, but establish a habit of getting angry.** More recently, cognitive and behavioral therapists have lined up behind heterostasis.

Most experimental research also tends to cast doubt on the theory of catharsis.

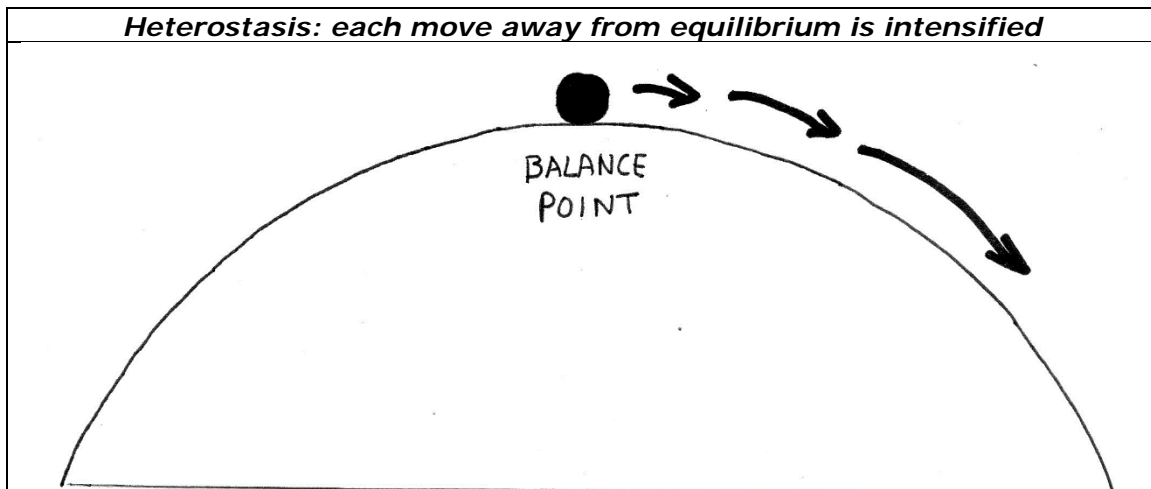
HETEROSTASIS: tendency to intensify movement in the same direction.

ADVOCATE: William James

EMOTIONS: assumes that emotional expression becomes a stronger habit each time it happens. Angry behavior leads to more anger.

ANALOGIES: The rich get richer, the poor get poorer.

BALL METAPHOR: Imagine a ball in the center of a turned-over soup bowl. Any external movement to the bowl may jar the ball toward one side or the other, and the farther it goes, the more likely it is to keep on going, faster and faster.



Berkowitz used the following technique to frustrate students who volunteered to participate in an experiment: they were given a boring paper and pencil task, and then when they turned it in, it was torn up and thrown away right in front of them. Half of the subjects were then placed in a group that was distracted for half an hour watching a movie. The other half of the students engaged in some cathartic activities, such as punching a bag and imagining it was the experimenters. An hour later, both groups had their level of anger measured. The distracted group turned out to be slightly lower.

Research on emotional storage	
<i>Researcher(s)</i>	Berkowitz
<i>Subjects</i>	College students
<i>Type of research</i>	Experiment
<i>Factors held Constant</i>	All students were given a boring task which was designed to build a level of frustration
<i>Independent Variable</i>	Half of the subjects engaged in simulated catharsis; the other half were distracted
<i>Dependent Variable</i>	How angry the subjects felt
<i>Results</i>	The subjects who had engaged in the simulated catharsis expressed higher levels of residual anger
<i>Ethical Considerations</i>	The frustration involved some deception of the subjects and may have posed a minor risk
<i>Conclusion</i>	Catharsis does not seem to reduce anger

QUESTION #9.9: What are defense mechanisms?

The theory of defense mechanisms was part of **Freudian** psychoanalysis. **Defense mechanisms are techniques that individuals develop to shield the conscious self (the ego) from tension.** Defense mechanisms operate unconsciously, so we are not even aware that we are using them. It is normal and even helpful to use these defense mechanisms, as they can prevent the self from being overwhelmed by frustration. However, excessive use of defense mechanisms is associated with mental illness.

Imagine that you have your hopes set on becoming an attorney, just like your father and grandfather. They went to Stanford Law School, and you know that it is rated as the best in the west. Your undergraduate GPA was so-so, not bad enough to prevent you from getting in, but not good enough to assure that you will get in, so you really need to get good LSAT scores. You take the test, and two weeks later a letter arrives from the Educational Testing Service. You open it up and see that the scores were pretty low. Here are how different defense mechanisms might deal with your frustration.

Repression pushes painful thoughts out of consciousness. (It is repression that can cause a memory loss of traumatic events. Sometimes hypnosis can get around the unconscious mental block of repression, and liberate these memories.) Using repression in the above situation, you might say "I wonder when my scores will arrive. It is about that time." (You have forgotten that you already saw them.)

Denial refuses to accept reality. Using denial in the above situation, you might say "These are not my scores. There must have been some mix up at the ETS."

Rationalization means coming up with pseudo reasons to explain away the pain. Rationalization might come in the form of saying why something really was not your fault. Using rationalization in the above situation, you might say "I was ill that day, I should not have taken the test. These scores are not a valid measure of my ability or potential to be a great lawyer."

Another slant on rationalization tries to come up with reasons why a loss is not that serious. Using this type of rationalization in the above situation, you might say "I did not want to be a lawyer anyway; it was all about trying to live up to my parents' ideals, and now I will not have to."

Fantasy is where the subject daydreams about an unreal situation that is not so frustrating. Using fantasy in the above situation, you might say "I am going to call the dean of Stanford Law School, and explain how I am destined to be another Abraham Lincoln, and of course they will let me in."

Reaction formation refers to the forced maintenance of a pseudo emotion opposite to the real one you are feeling. Using reaction formation in the above example, you might say "Tonight, we party!"

Projection shifts the blame to another person, usually in a suspicious way. Using projection in the above situation, you might say "They knew I was going to be a great lawyer, reforming the whole corrupt system and that is why they changed my scores to keep me out of law school."

Regression means going back to a more childish level of coping. Using regression in the above example, you might get out some old video games you haven't played in two years and try to re-experience that joyous absorption.

Displacement is the idea of discharging anger on to an innocent third party. (This ties in with Freud's theory of homeostatic emotional storage.) Using displacement in the above example, when your sister comes back from cheerleading practice you might say something intentionally hurtful like "When are you going to grow up and get a life" belittling her accomplishments so that your disappointment does not seem so great in comparison.

Compensation means trying to achieve a success in a different area to compensate for your loss in another area. Using compensation in the above example you might say "There is still time to study for the GMAT and get into a good business school. Corporate lawyers do not make as much as CEOs." Compensation is one of the healthiest defense mechanisms.

Sublimation is the rechanneling of drives into more socially acceptable behaviors. Sublimation is not a term widely utilized outside of psychoanalytic circles because it assumes that sexual and aggressive energies accumulate and need to be discharged. Sublimation holds that it is possible to take the aggressive drive that is pushing you to be a competitive lawyer and re-channel that into another field, such as business.

UNIT 10: PERSONALITY

QUESTION #10.1: What is personality?

Personality is an individual's unique, integrated, and enduring pattern of coping. Personality tests and theories must be able to describe the uniqueness of each individual, and yet compare one person with another, explaining the reasons for the differences. Personality theories must also be able to explain how the different aspects of a personality all fit together in some form of unified, integrated whole. Finally, personality theories must be able to explain the relative stability of personality across an individual's life span, through an ever-changing array of developmental tasks and situational challenges. Psychologists disagree about how much of personality is inherited **temperament** and how much is determined by the environment, and how much is left up to individual choices (free will).

It is important to emphasize what personality is not. Most people's "common sense" approach to personality is that it is merely a set of aptitudes or skills for getting along with others. Some girls come back from a first date, and when asked how it went, reply "Nice guy, but no personality." By the official definition, everyone has a personality. What the girl should have said was "His personality was not the one I would prefer in a long term relationship." What most of us would probably infer from her answer is that her date was a little low on the trait of extraversion.

Personality should not be confused with **mood** level: the **emotions** that a person experiences are temporary states. Personality is composed of enduring traits. To say "He is sad" describes a mood, unless you mean "He has had a tendency to be sad most of the time, since he was a little child" and only then would it be more of a personality trait. Do not confuse traits with **attitudes** which will be discussed later.

QUESTION #10.2: How are personality traits measured?

Traits are the specific, empirically measurable components of personality. This approach began with William **James**, who suggested that psychology focus on specific, enduring habits defining a person. Although a habit may have arisen as a result of a specific environment in which the organism developed, the habit comes to have a life of its own, and guides behavior in the future even when the environment changes greatly.

By the 1930s, Gordon **Allport** had focused the study of personality on traits, seeing them as the distinguishing characteristics or qualities of individuals that guide their behavior through a variety of situations. Traits are enduring predispositions to respond in a certain way to different kinds of stimuli. Traits even motivate the person to seek out certain types of stimuli. Traits should be measurable on a continuum of low to high, especially if we want to compare an individual to some external norms.

An **adjective checklist** is the easiest way to measure traits. This is a list of words (adjectives) each describing a specific trait. The subject is told to circle each adjective that he thinks describes him, the way that he sees himself as being, most of the time. Sometimes the subject might be told to circle a certain maximum or minimum number if it is found that some people are circling all or very few terms.

FRANK	HUMBLE	PERSISTENT	SHY
HONEST	MATERIALISTIC	STABLE	PRACTICAL
ANALYTICAL	CAUTIOUS	CURIOUS	INTELLECTUAL
PRECISE	RATIONAL	METHODICAL	INTROVERTED
DISORDERLY	EXPRESSIVE	EMOTIONAL	IMPRACTICAL
INTUITIVE	ORIGINAL	NONCONFORMING	COMPLICATED
CONVINCING	HELPFUL	KIND	TACTFUL
COOPERATIVE	RESPONSIBLE	UNDERSTANDING	FRIENDLY
ADVENTUROUS	DOMINEERING	OPTIMISTIC	POPULAR
AMBITIOUS	ENERGETIC	PLEASURE-SEEKING	CONFIDENT
CONSCIENTIOUS	DEPENDABLE	ORDERLY	SELF-CONTROLLED
CAREFUL	OBEDIENT	DETAILED	EFFICIENT

The scoring for an adjective checklist is not very precise; on each of these 48 traits we simply categorize a person as *yes* or *no* depending upon whether or not the trait was circled. A greater precision of measurement can be obtained by using an ordinal scale that permits of more gradations of response. Instead of asking, "Are you shy: yes or no" we could ask ...

Would you describe yourself as shy?

DEFINITELY	PROBABLY	POSSIBLY	NO WAY
------------	----------	----------	--------

Would someone who knows you well would describe you as shy?

VERY LIKELY	SOMEWHAT LIKELY	SOMEWHAT UNLIKELY	VERY UNLIKELY
----------------	--------------------	----------------------	------------------

How often are you shy around others?

ALWAYS	MOST OF THE TIME	ABOUT HALF THE TIME	SELDOM	NEVER
--------	------------------	---------------------	--------	-------

For example, look at the last two rows of the 48 adjectives presented above. Each of the eight adjectives describes a similar trait, one that might be very helpful in someone hired as a filing clerk. We could score each person from 0 to 8 based upon the number of adjectives circled, or we could have each person rate each adjective 0 to 10, and then add up the total score, yielding a range of 0 to 80.

One of the most important personality traits studied by psychological research over the past forty years has been **locus of control** developed by Julian **Rotter**, who represents a synthesis of the cognitive and social learning approaches. Like Bandura, Rotter did not believe in a direct link between stimulus and response. Rotter thought that there were **cognitive** variables mediating between the two: that we consciously choose which response to utilize depending on the reinforcement or punishment we expect to receive.

STIMULUS -----> COGNITIVE ANALYSIS OF SITUATION, AND
ASSESSMENT OF EXPECTED REINFORCEMENT -----> RESPONSE

Similar to Skinner's model, Rotter credited reinforcement with having the main control over learning. However, Rotter said that people could choose the situations in which to place themselves. Rotter said that our previous experience with the environment teaches us which kinds of reinforcement to expect. Rotter classified people according to whether they believed that things merely happened to them or that things were really under their own control. **Internal** locus of control means that people believe that they are masters of their own destiny. **External** locus of control means that people believe that things outside of their own control determine what happens in their lives.

Rotter's model was heterostatic. If a person has external locus of control, he is more likely to behave in a passive way, and obtain less positive reinforcement from the environment, and this will confirm the external locus. If a person has internal locus of control, she is more likely to behave in an active, future-oriented way, and obtain more positive reinforcement from the environment. One's locus of control becomes a self-fulfilling prophecy.

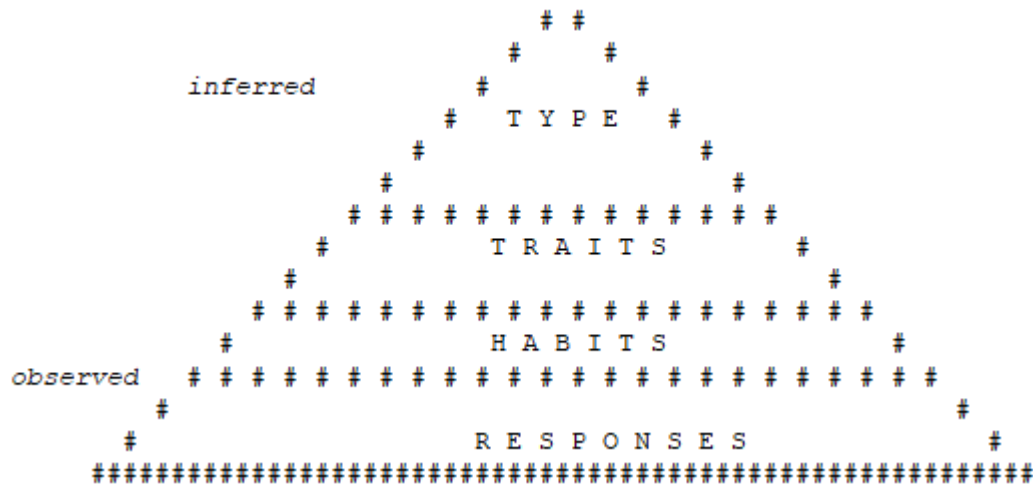
STIMULUS	ORGANISM	RESPONSE
=====	=====	=====
= student gets =	= student =	= "I did not =
= back low =	= who has =	= understand =
= grade on an	=====> INTERNAL =====>	= the material, =
= assignment =	= locus of =	= I will have =
=	= control =	= to study." =
=====	=====	=====

STIMULUS	ORGANISM	RESPONSE
= student gets =	= student =	= "The teacher =
= back low =	= who has =	= grades way =
= grade on an	= EXTERNAL	= too hard, =
= assignment =	= locus of =	= so I just =
= =	= control =	= give up." =

The future results that each subject gets will only serve to confirm his or her locus of control.

Finding just the right number of traits on which to focus has been a main topic of trait psychologists. It may be possible to reduce a myriad of separate traits into just a few superfactors that contain highly correlated traits. Hans **Eysenck** suggested three such embracing traits: **extraversion** (outgoingness), **neuroticism** (tendencies of anxiety and fear) and **psychoticism** (which included impulsivity, creativity, and anti-social tendencies).

<i>Eysenck's 3 dimensions</i>	
Trait	Includes
Extraversion	Sociable, lively, active, assertive, sensation-seeking
Neuroticism	Tense, low self-esteem, guilt feelings
Psychoticism	Aggressive, cold, egocentric, impersonal, impulsive



Eysenck also developed a pyramid of personality, showing the relationship between typologies, measurable traits, specific habits and responses in situations. Specific responses are what is observed, and the higher up we go on the pyramid, the more we are inferring non-observed concepts.

<i>Costa & McCrae's Big 5 Traits</i>		
TRAIT	INCLUDES	EXAMPLE
Openness	Curious, original, imaginative, broad interests	Leonardo da Vinci
Extraversion	Gregarious, assertive, talkative	Axel Foley
Conscientiousness	Dutiful, organized, hard-working, punctual	Robo Cop
Agreeableness	Altruistic, compliant, modest, lenient, soft-hearted	Mister Rogers
Neurotic	Anxious, sad, hostile, insecure, worrying	Woody Allen

Costa and McCrae developed the **NEO 5** test, in which they accepted Eysenck's traits of extraversion and neuroticism, but included openness (seeking new experiences), agreeableness (people whom others find pleasant to be around), and conscientiousness (this has a few similarities to the opposite of Eysenck's psychoticism, especially impulsiveness). These "big five" traits are sometimes remembered with the acronym OCEAN.

Another mnemonic for these traits would be to visualize famous people (historical or fictional) who epitomize that trait.

British mathematician Raymond **Cattell** used a technique called factor analysis, a technique of internal reliability, to discern which separate items on a questionnaire actually measure the same variable. Starting with hundreds of separate traits, he was able to collapse the number of important traits down to sixteen, because dozens of items turned out to be just measuring the same factor. The result was a long, objectively scored, paper and pencil test, the **16PF**. Each subject gets a profile, a percentile rank on these sixteen scales.

<i>Cattell's 16 PF traits</i>		
Scale	Low end	High end
A	Reserved	Outgoing
B	Concrete thinking	Abstract thinking
C	Emotional	Stable
E	Submissive	Dominant
F	Serious	Happy-go-lucky
G	Expedient	Conscientious
H	Timid	Bold
I	Tough-minded	Sensitive
L	Trusting	Suspicious
M	Practical	Imaginative
N	Forthright	Shrewd
O	Self-assured	Apprehension
Q1	Conservative	Experimenting
Q2	Group dependent	Self-sufficient
Q3	Uncontrolled	Controlled
Q4	Relaxed	Tense

When most people see their 16PF results they are disappointed, because most of scales show scores that hug the middle, between the 40th and 60th percentiles, and people tend to think of themselves as more unusual in their personalities than they really are. Statistically, most people are close to the average on most scales. One useful feature of the 16PF is that it looks at such different dimensions of personality, that research attempting to correlate just about any variable with a 16PF profile is virtually guaranteed to find at least one scale where at least a moderate correlation can be found.

The Minnesota Multiphasic Personality Inventory (MMPI) is one of the longest paper and pencil personality tests. It was developed over seventy years ago as a comprehensive psychiatric screening test for medical patients. The MMPI has ten basic "clinical" scales

<i>Clinical Scales of the MMPI</i>		
Scale	Abbreviation	What it purports to measure
1 hypochondriasis	Hs	Concern with bodily functions
2 depression	D	Pessimism, hopelessness
3 hysteria	Hy	Exaggeration of symptoms
4 psychopathy	Pd	Disregard for social standards
5 masculinity	Mf	Gender role-based interests
6 paranoia	Pa	Suspiciousness, delusions of persecution
7 psychasthenia	Pt	Guilt feelings, tendency to worry
8 schizophrenia	Sc	Bizarre thoughts, withdrawn
9 hypomania	Ma	Overactive, excited, impulsive
10 introversion	Si	Shyness, inhibition

Over many years, the role of the MMPI has gradually shifted from psychiatric diagnosis to personality profiling. Newer, more valid tests have been developed to assess disorders such as depression.

One of the helpful features of the MMPI is that it has several built in "validity scales" which can serve as lie detectors. This is based upon the fact that most subjects who try to fake their way through the MMPI (e.g., a job applicant who wants to appear more responsible, a prisoner who wants to appear certifiably insane) will give a certain pattern of answers which are rarely given by people who really have those traits. So, if you ever take the MMPI, do not try to beat it, just be honest.

The great length of the MMPI has enabled investigators to create new scales over the years to measure hundreds of specific traits such as addiction proneness, ego strength, and the tendency to use certain defense mechanisms. With the scoring and word processing capacities of computers, it is possible to feed in the subject's raw answers to the questions, and get out numerical data on hundreds of scales, and a twenty-page narrative report which many therapists find to be a most useful window into the mind of a new patient.

QUESTION #10.3: What are the main typologies?

A **typology** is a theoretical approach that classifies people into **specific types** (two, three, four, twelve, etc. categories). A good typology of personality should be clear-cut, exhaustive, permanent, empirically based, and relevant. *Clear-cut* means that people should be classified into one category or another. If introverts and extraverts are two distinct types, rather than a trait that is a continuum, then people should come down on one side or the other, and no one should be straddling the fence in the middle. *Exhaustive* means that we have enough types to classify everyone. *Permanence* refers to the enduring characteristic of personality: someone should not be classified as an introvert type today, and an extravert next week.

The empirical basis is the essential criterion for all scientific theories. (Ancient typologies, such as the twelve signs of the **astrological zodiac**, do not have an empirical foundation, and are therefore mere pseudo-science). Attempts to validate astrology have been made using a variety of trait and type measures, and usually have to accept the null hypothesis rather than the predicted relationship between specific zodiac signs and specific personality traits.

Attempted validation of astrology				
		Independent measure of trait		
		Bold	Not bold	Totals
S I G N	Aries	6	4	10
	Other signs	44	46	90
Totals		50	50	N = 100
$r = +.07, p > .20$ ACCEPT THE NULL				

In the example above, about half of people describe themselves as bold, whether or not they are Aries, so we must accept the null hypothesis rather than claim that astrology has predictive value.

Typologies must be relevant. These theories must help psychologists by identifying subjects who should be treated differently. An industrial psychologist might want to identify the type of job applicant that will be suited to the demands of a particular career. A psychologist studying consumer behavior would want a typology to identify the type

of people who would be most likely to become the potential customers of a new product. A counseling psychologist specializing in the adoption of children might want to identify which type of would-be parents would turn out to be good parents for special needs children up for adoption.

One old typology that began with ancient Greek physicians (e.g., **Hippocrates, Galen**) started with the premise that an imbalance in **bodily fluids** (e.g., blood, phlegm) might lie at the core of personality differences. Hippocrates speculated that there were four basic fluids (humors), and it was the relative excess of these fluids that shaped personality. These ideas are merely in rudimentary form in Hippocrates, and were formalized by later writers (e.g., Galen).

<i>Hippocrates' typology</i>			
<i>Type</i>	<i>excess of</i>	<i>Seeks</i>	<i>behavior</i>
Sanguine	Blood	Pleasure	Happy-go-lucky
Choleric	Yellow bile	Power	Hot-headed
Melancholic	Black bile	Perfection	Sad
Phlegmatic	Phlegm	Peace	Calm, sluggish

The original empirical foundation was inadequate, being based mostly upon case studies. However, Hans Eysenck later used large sample surveys to demonstrate that traits do cluster into these four types according to the dimensions of introversion/extraversion, and neuroticism/stability.

<i>Eysenck's understanding of Hippocrates</i>		
	<i>Introvert</i>	<i>Extravert</i>
<i>Neurotic</i>	Melancholic	Choleric
<i>Stable</i>	Phlegmatic	Sanguine

Florence Littauer made the theory relevant for contemporary marriage counseling by defining the key difference between the types (not as imbalance of bodily fluids) but as the individual's central goal in life: power, perfection, pleasure, or peace. Littauer noted that two people of the same type rarely couple successfully. Two choleric would both try to be the boss, while two phlegmatics would have each trying

to defer to the other; yet a choleric and a phlegmatic would get along great: the choleric would lead and the phlegmatic would follow.

Case Study: At age 21 Mr. V went out on his first date and proposed two weeks later. Mr. V was a man of few words and a calm mood, but his wife was gabby and bossy. After several years on their ranch, they were still using empty fruit boxes for furniture. After Mr. V returned from being paid cash for their first really good harvest, Mrs. V began talking about the different types of furniture they could get. Mr. V just put the roll of money on the broad plank that served as their table and said four words, "Get what you want."

Similarly, two melancholics would not make a good marriage: each might try to outdo the other in displays of sacrifice. Two sanguines might have a good time (until the money ran out). A sanguine and a melancholic could make a good pair. The melancholic both enables and provides realistic limits for the sanguine, experiencing joy vicariously through the pleasure seeking partner.

Case Study: Mrs. C, now 77, was described in the last chapter as a migraine patient. Her perfectionistic personality made her a dutiful farm daughter, and later an efficient office worker. She married at age 20 to Mr. C, a sanguine seven years her senior. She thinks that he is the perfect husband for her because "He knows how to have fun" and she has followed his lead, doing things like going dancing, entertaining at home and going on cruises, that she would not have done on her own. He agrees that she has been the perfect wife for him, occasionally restraining his excessive spending. What he likes most about his wife is that he can delegate the details to her and be confident that she will get the job done. "We share the same goal: keeping me happy."

Another theory that appears simplistic on the surface was William **Sheldon's somatotypology of body types**.

Sheldon's typology				
<i>Personality Type</i>	<i>Body type</i>	<i>Body type</i>	<i>Simpson</i>	<i>Characteristics</i>
Visceratonic	Endomorphic	Fat	Homer	Joyful, sociable
Somatotonic	Mesomorphic	Muscular	Bart	Bold, confident
Cerebratonic	Ectomorphic	Skinny	Lisa	Withdrawn, intellectual

Sheldon recognized that early childhood was a critical period in which the individual's body type and his social environment interacted to shape the personality for a lifetime. Adults assume that endomorphs love food, and use this to establish social bonds. For mesomorphs, both adults and peers expect more in terms of athletics, aggression, and leadership from muscular boys who go through puberty early. Ectomorphs, lacking in muscle or fat to protect their bones from the rough and tumble play of childhood, withdraw and pursue things intellectual.

Later investigators were unable to replicate Sheldon's findings. The stereotypical view of "fat and jolly" is inconsistent with modern research which shows more depression associated with obesity. Sheldon did influence Bill Wilson, founder of Alcoholics Anonymous, who argued that alcoholism should be seen as a disease because it is due to an inherited body type unable to resist addiction.

Alfred **Adler** suggested a typology based upon **birth order**. The first-born child (oldest sibling) tends to get more parental attention, and identify more closely with the parents and their values. First-borns also get more experience bossing around younger siblings. First-borns are more authoritarian, achievement oriented, and seek positions of power (e.g., priesthood, law enforcement). Youngest children (last-borns) are more likely to be pampered. They tend to be impatient and rebellious. Middle children lack the parental attention lavished on both the oldest and youngest, and may perceive that they are neglected. They may compensate for this through the development of inter-personal skills, becoming smooth negotiators. Children without siblings (only children) run the risks of combining the problems of both the oldest and youngest siblings.

<i>Adler's birth order typology</i>		
<i>Birth order</i>	<i>Other siblings</i>	<i>Interpersonal</i>
FIRST BORNs	Oldest sibling	Identify with parents; responsible, achieving, nurturing
MIDDLE CHILDREN	On both sides	May perceive that they are neglected and compensate with social skills
LAST BORNs	Youngest sibling	Identify with peers; rebellious, creative, many are spoiled
ONLY CHILDREN	No siblings	May be spoiled and/or perceive that they are neglected; some have a deficit of social skills

Case Study: the R brothers were the three sons born to an immigrant father, and were born just two years apart. Karl Junior was the first-born. He always made his Papa proud, doing well at school and helping out in the family business (specialized industrial castings made in the garage and delivered in an old station wagon). Junior graduated summa cum laude from a prestigious private university, served as an officer in the Air Force, and then got his doctoral degree and became a college professor, just as Papa had hoped. John was the middle son, the handsomest and most charming of the three. He was better at interacting with the customers than he was making the castings. He became student body president of the local high school, and also graduated from the same prestigious private university, though not with the honors of his older brother. John taught at the local middle school for a while, and then decided to travel around the world and get temporary teaching jobs along the way. The last anyone heard of him, he was principal of a private school in Africa. Willy was the youngest boy, somewhat spoiled by the mother and sometimes a disappointment to the father. Whenever the high school had a performance, Willy would sing and dance and act, usually in a lead role. After graduation, he headed for Broadway, where he had some success. Late one summer, the father was dying, and the

three brothers came home. When Papa passed away, the two older brothers had to get back to their teaching assignments, but Willy was between shows and offered to wind down the father's business. As he called the customers he heard "Your dad was a great craftsman, but he had no business sense. He should have mass produced some of those parts." Willy got his mother's and brothers' OK to take over the business. He turned it into a multi-national corporation. If his father had lived, there would have been no way that Willy could have joined the business, but now his energy and innovation could create something new. Most of his products are made in Asia and sold around the world through various distributors.

Adorno's typology			
		Status of defendant	
		<i>Street criminal</i>	<i>Brutal policeman</i>
J U R O R	<i>Authoritarian</i>	Vote for a conviction; Mete out harsh sentence	Vote for an acquittal; Mete out lenient sentence
	<i>Egalitarian</i>	Vote for an acquittal; Mete out lenient sentence	Vote for a conviction; Mete out harsh sentence

Social psychologist Robert **Adorno** developed a typology that is relevant to the consultants who help attorneys select and present cases to juries. Adorno identified an **authoritarian** type who tended to identify with authority figures (e.g., the military, law enforcement). On a jury deciding the fate of a man accused of a street crime, authoritarians would be more likely to convict, even with questionable evidence, and after conviction, authoritarians would be more likely to mete out a stiff sentence. The opposite type, **egalitarians**, value freedom and distrust authority figures. On a jury deciding the fate of a man accused of a street crime, egalitarians would be more likely to acquit on questionable evidence, and if there was a conviction, the egalitarians would be more likely to mete out a lenient sentence. However, if the defendant were an authority figure, such as a police officer accused of brutality, the behaviors of the egalitarians and authoritarians would be reversed.

Case Study: Mr. B, 53, has never served in the military, but he sometimes fantasizes that he should have had a career in the navy. He is comfortable with authority figures like police and priests. He has never been arrested. If he is ever stopped by traffic police, he is totally cooperative. He has never tried any illegal drugs. He has been summoned for jury duty a half dozen times, but never selected to hear a case. The defense attorneys wisely identify Mr. B as someone who would not be sympathetic to their gang member clients.

Cardiologist Meyer **Friedman** noticed a pattern of personality traits among his **heart attack** patients. He called this **Type A** (ambitious, demanding, impatient, competitive). Lower incidence of heart attack was found among the opposite type, which Friedman called **Type B** (easy-going). Remember that the terms A and B are just letters used to distinguish between the two personality types, and do not correlate with blood types: A, B, AB and O.

Friedman's typology	
Type A	Type B
Workaholic	Enjoys leisure
Competitive	Cooperative
Hard-driving	Easy-going
High risk of heart attack	Low risk of heart attack
Impatient	Patient

Case Study: Mr. B, 53, took the Jenkins Activity Schedule (which measures Type A tendencies) when he was 34, and scored in the 96th percentile. His career at that time was a management consultant, and his future career goal was to become a venture capitalist. He made enough money to buy a luxury car, a ranch with horses, and a large vacation home in Acapulco, but even when he goes there he brings his work and is tied to the rest of the world with electronic communication. He feels guilty if he spends more than an hour in his boat on the lagoon. Although he eats a reasonably healthy diet and exercises regularly, he had his first heart attack at age 50 (the chest pains began while he was waiting in a long line at a store). He went home and worked on his computer for a couple of hours before the pain got so severe that he had to go to the emergency room. (He even brought something to read while he was in the emergency room).

Sandra **Bem** found a relevant typology in terms of masculine, feminine, or **androgynous**. Stereotypically masculine traits included being logical, emotionally stable, work oriented, and assertive. Stereotypically feminine traits included being more nurturing and sensitive to the needs of others. Bem noticed that over the past forty years, more men and women have developed an androgynous personality type that includes some of the traits stereotypically associated with the other gender. Do not confuse the term androgynous (having the personality traits of both genders) with hermaphroditism (have the genitals of both sexes) or bisexuality (being sexually attracted to both males and females).

<i>Bem's typology</i>	
Masculine	Feminine
Logical	Emotional
Competitive	Cooperative
Aggressive	Nurturing

The most comprehensive type theory is that of C.G. **Jung**, and is assessed by the **Myers-Briggs Type Indicator (MBTI)**, a long paper and pencil test. There are four dimensions of this theory, and 16 resulting types. The first dimension is the introvert (I), extravert (E). Next is the perceptive function, and the typology is determined by how people get information about reality, mostly from external cues through the senses (S) or through internal vibes, intuitive (N). Next is the judging function, and the typology is either thinking (T) or emotional, feeling (F). If a person's judging function is stronger than his perceptive function, he is classified as a judging (J), but otherwise he is classified as a perceptive (P).

<i>Jung's typology</i>		
	Term	Description
I	Introverted	Withdrawn from social interaction
E	Extraverted	Seeks social interaction
S	Sensate	Perception oriented to external cues
N	Intuitive	Perception oriented to internal cues
T	Thinking	Judge according to logic, reason
F	Feeling	Judge according to emotion
J	Judging	Decisive, rigid
P	Perceptive	Flexible, but indecisive

Case Study: Mr. B, age 53, has taken Myers-Briggs twice and as well as the Kiersey test, which also gives a profile. He is always categorized as an INTJ. His high school counselor once told him, "Your problem is you are so much smarter than the other kids, and you know it" to which Mr. B responded "The problem is that I am right, and I know it." This approach is typical of INTJs who are very independent thinkers who set high goals for themselves and their organizations. Mr. B is not a person who enjoys small talk or suffers fools gladly.

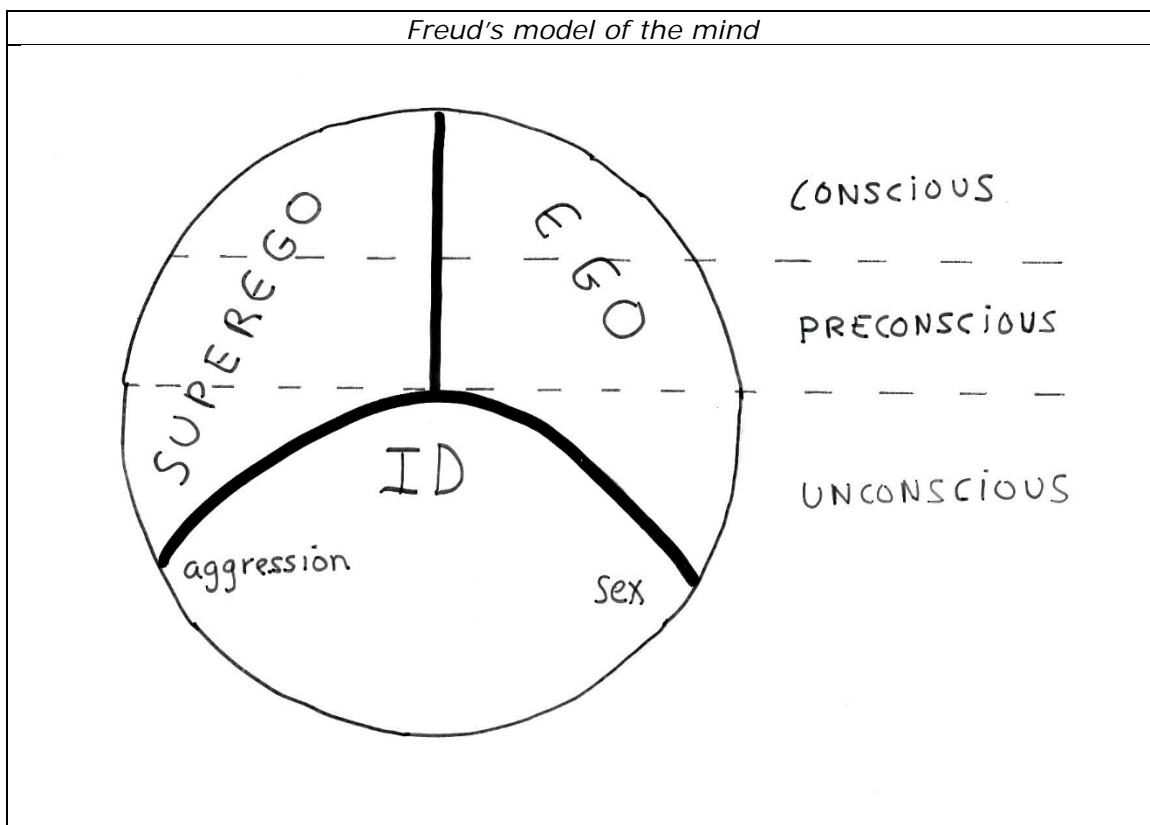
QUESTION #10.4: What is psychodynamic theory?

Psychodynamic theory is based on the **psychoanalytic** model of Sigmund **Freud**. As early as the late 1880s, [Freud](#) speculated that sexual energy (known as *eros* or the *libido*) was the primary force of the psyche. This was a homeostatic model: energy built up, and had to be released, otherwise problems (e.g., neuroses) would result. During World War I, Freud speculated that there was a second source of energy, the death instinct, which became variously known as *thanatos*, *destrudo*, or *mortido*. Dreams are powered by these energy sources, but disguise their content with symbols.

Freud's structural model was not completed until the 1920s, but it became increasingly important in his later theory. The psyche has three components: id, superego, and ego. The **id is the source of the sexual and aggressive drives** and engages in primary process thought (fantasy) and follows the pleasure principle: it seeks immediate release of these drives, now, regardless of the social context or consequences.

The superego is the conscience that makes us feel guilty. It attempts to repress the sexual and aggressive drives of the id. The superego is formed around the age of two by identification with the parents and is powered by the death instinct energy that it converts from the id.

When Freud used the term ego, he did not mean it in the way that many people use it today, to convey excessive conceit. Freud saw the **ego as the rational self that attempts to balance the demands of id and superego, as well as relate to the demands of external reality.** Therefore, it uses secondary process thought (reason) and follows the reality principle. It is powered by *eros* energy that has been converted from the id.



Let's try this analogy. Imagine that you are driving down the freeway in very hectic traffic. There are two fussy kids in the backseat. You (the ego) must not get distracted by the kids (id and superego), but remain focused on the road (reality principle). But the kids won't shut

up. Id constantly urges the expression of the sexual or aggressive drives. "Look at that woman in the next line: she is not wearing much. Don't let that guy cut in front of you: honk at him and give him the finger." Superego then blurts out "You are so pathetic: just thinking those dirty thoughts." The ego wishes they would both be quiet long enough to get off the freeway. Sometimes the ego uses a special mechanism which is like a sound proof internal window separating the front seat from the back seat, just to have a moment of peace (and that is what the defense mechanisms do).

This conflict between conscience and the drives of sex and aggression is epitomized by what Freud called the **Oedipus Complex**. In the Greek myth, the King of Thebes goes to an oracle before the birth of his first child, and is told "This child will kill his father and marry his mother." To prevent this from coming about, the king orders that the newborn be taken up to the mountain top and slain, but the servant charged with this task merely abandons the baby there. Meanwhile, a passerby discovers the abandoned baby and takes him along, over the hill, into the next kingdom. There the king and queen, who have been childless, adopt the baby, name him Oedipus, and vow never to tell him that he was adopted. When Oedipus becomes a young man at 18, he goes to an oracle and is told "You will kill your father and marry your mother." To prevent this from coming about, he immediately leaves the land of his (adoptive) parents by traveling over the hill (but that brings him into the land of his biological parents). He meets an old man on the road, they quarrel, and the old man is killed (his biological father). Eventually, Oedipus solves a riddle posed by the sphinx, and is declared the new king of Thebes, but part of the deal is that he has to marry the old widow of the last king, and she just happens to be his biological mother. Freud was convinced that the Oedipus story depicted a universal urge of little boys to kill their fathers (aggressive drive) and marry their mothers (sexual drive). Little girls have the Electra Complex, desiring to kill their mothers and marry their fathers.

If you are thinking that Freud must be a real "sicko" to come up with such dirty and ridiculous ideas, he would respond that you are just in denial of your own unresolved Oedipal feelings. If you sincerely cannot remember hating the parent of the same sex, and lusting for the parent of the opposite sex, the fantasies must be repressed, and therefore unconscious.

When Freud uses the term unconscious, he does not mean that you are knocked out. **The unconscious is a region of the mind, a deep level in which you are not aware of what is going on.** Freud himself used the analogy of an iceberg to understand levels of consciousness. Just as most of the iceberg is always below the water, so most of the mind is below our capacity to gain awareness of its contents. The individual cannot voluntarily bring these contents into consciousness. They may come out involuntarily in dreams, fantasies, or mental disorders. The energies of the *libido* and *thanatos* lurk in the unconscious. Painful memories and shameful fantasies are often forced into the unconscious by defense mechanisms such as repression. During therapy, patients may experience a blockage of sensitive unconscious contents or a refusal to accept the analyst's interpretation (known as resistance).

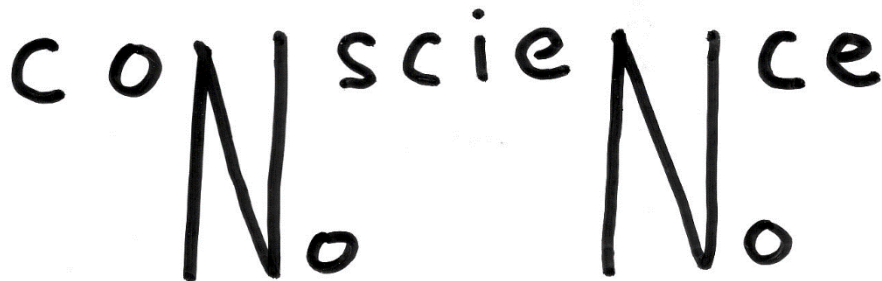
The **conscious** level would correspond to the tiny tip of the iceberg that is always above the water. The conscious is that part which the individual is aware of at any given moment. The preconscious is that part which the individual can bring into consciousness, but which is not now the focus of attention, and would correspond to that part of the iceberg which bobs up and down in the water. Freud and psychoanalysts do not use the term **subconscious**, and in this class, neither should you.

How to remember CONSCIOUS: the eyes are open, aware



We have just introduced two terms, conscious and conscience, which you might confuse. Here is how to remember them. The conscious relates to a level of awareness. The conscience is the part of your mind that makes you feel guilty.

How to remember CONSCIENCE: it tells you what you cannot do



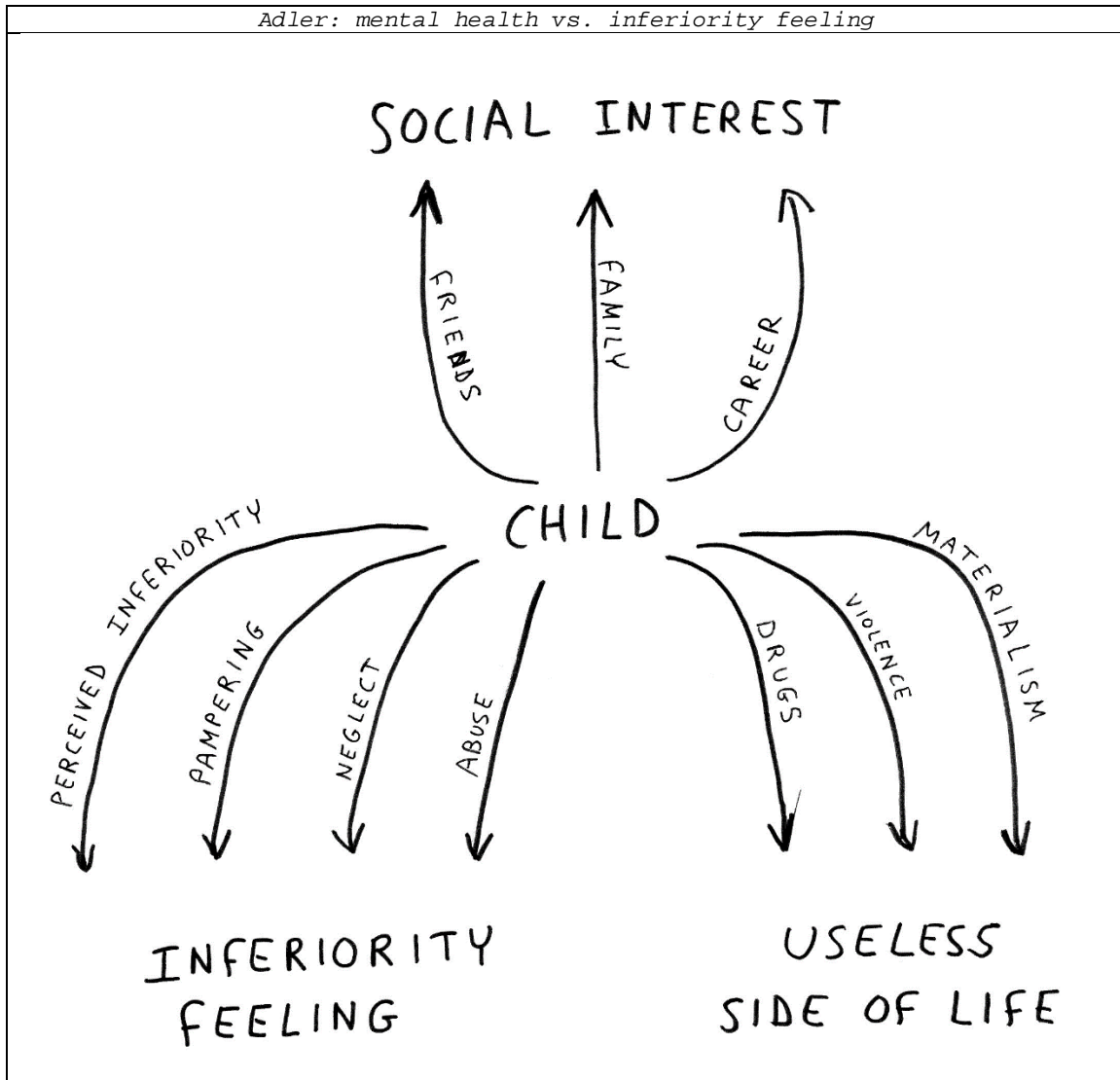
Freud's levels of consciousness and his structural model of the ego-id-superego overlap: all of the id is unconscious, and so are some regions of the ego and superego.

Freud's daughter, Anna, became head of the psychoanalytic movement after his death and extended Sigmund's elaboration of defense mechanisms (things that the ego unconsciously tells itself in order to cope with the stress). Her increasing focus on inter-personal relations in early childhood lead to the neo-psychoanalytic movement known as **Object Relations**.

QUESTION #10.5: What is humanistic theory?

Humanistic theories of personality assume that people are essentially good: capable of free will and love. Some of Freud's early collaborators broke with him and moved in a humanistic direction. Later, many American psychologists broke with behaviorism and furthered the humanistic approach.

Alfred **Adler** broke with Freud in 1912 over the latter's increasing emphasis on the Oedipus Complex. Adler's own school became known as Individual Psychology. [Adler](#) viewed people as social beings rather than sexual and aggressive drives. The coping patterns which individuals learn in early childhood in the relationship with parents and siblings influence (but do not rigidly determine) later life functioning. There is a tendency for neglected and abused children to develop low self esteem (inferiority feeling) and cope poorly as adults. Also, children who are spoiled or pampered or overly protected do not learn to cope effectively. In later life, effective coping is attained via the defense mechanism of compensation (overcoming inferiority feeling by means of achievements) and is distinguished by what Adler called social interest. This healthy approach is reflected and reinforced by interpersonal activity such as career, family, and friends.

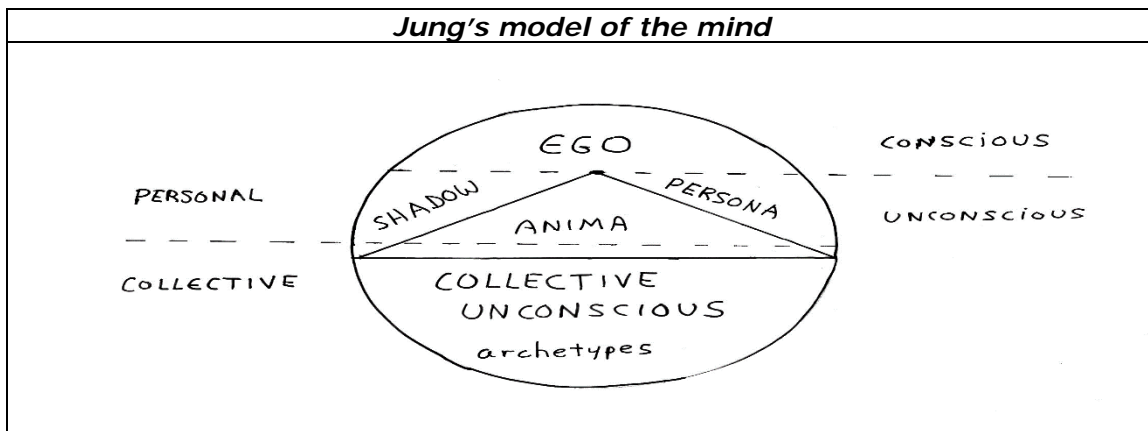


Adler came to reject the Oedipus Complex in favor of the **Inferiority** Complex. All individuals experience some sense of inferiority as a result of being born children in an adult world. Most people gradually overcome it with social interest, but it is harder for those who have excessive inferiorities or faulty parenting (e.g., being pampered or neglected). This model was heterostatic: people who developed some social interest had better social experiences, and these then reflected and reinforced the development of more social interest. In those adults with persistent inferiority feeling, there is the development of inappropriate guiding "fictions," whose purpose it is to assuage inferiority feeling, but which then lead people to disconnect from interpersonal reality, and develop dysfunctional behaviors which reflect and reinforce inferiority and self-boundedness. One example would be the attempt to cover up inferiority feeling by acting tough and violent. Adler's formula for success boils down to: stop feeling sorry for yourself, and start doing something for others.

While Freud argued that human behavior was determined by the forces of sex and aggression, Adler was a champion of free will. He acknowledged both heredity and environment as influences upon behavior, but he said that a person's interpretation of her heredity and environment was more important. (This view established Adler as a forerunner of cognitive psychotherapy.) Adler is also known as the first major humanistic theorist: people were essentially good, capable of love, and overcoming sexual and aggressive drives, as well as inferiority feeling.

C.G. Jung broke with Freud in 1913 over similar reasons. His school became known as Analytical Psychology. Jung accepted Freud's concept that most of the psyche was unconscious, but contended that Freud had not gone deep enough. Jung credited Freud with having discovered the personal unconscious, but Jung saw **a deeper level, the collective unconscious** composed of inherited patterns of symbol formation known as **archetypes**. Jung used Freud's term, *libido*, to describe the creative energy coming from the collective unconscious, and did not reduce it to a mere sexual or aggressive drive, but more of a numinous life force. Jung's model has both a homeostatic component (energy builds up and must be released) as well as a heterostatic component (the release of energy can lead to transformation which drives individual growth, which Jung referred to as psychic integration or individuation. Jung criticized Freud for offering a sterile view of symbols as mere signs of sexual energy. Jung thought that symbols could serve as gradients that brought the energy from the unconscious and then harnessed it in the service of individuation.

Jung's structural model included the ego as the conscious component that is the center of individuality. It is the process of the transformation of the *ego* via the provision of the energy from the unconscious that is the essence of the process of individuation. At the level of the personal unconscious, there are three components. The *anima* (in men) or *animus* (in women) is formed out of the contrasexual characteristics that are repressed when the ego assumes a gender role. The *persona* represents the social roles that unconsciously influence individual behavior. The *shadow* is formed out of the parts of the self repressed by the *persona*. The shadow is what we are most ashamed of. People who are out of touch with their anima(us) or shadow have a tendency to project them onto external phenomena and other persons.

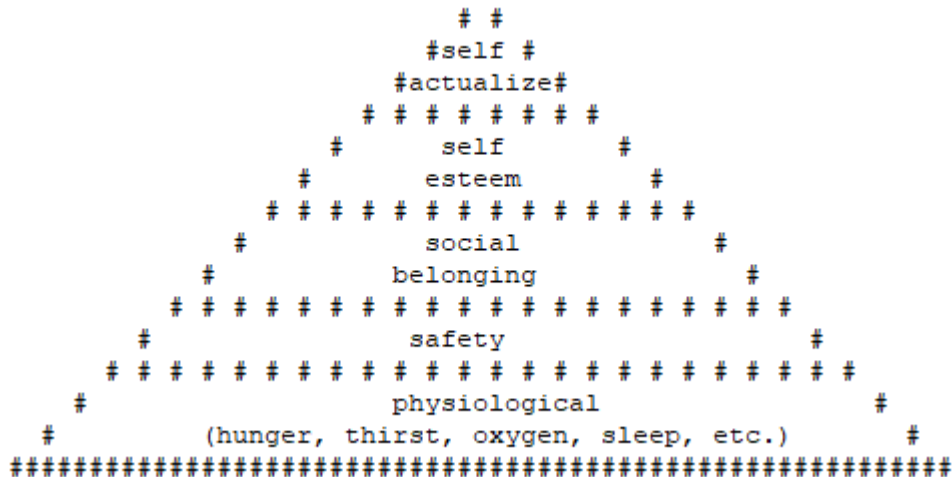


Jung was an advocate of free will. Although all energy comes from the unconscious, it is the task of life to find symbols that can harness it. Jung was clearly an optimist. He had a great respect for the creativity in all individuals and all cultures. He viewed religion and art as vehicles that different peoples have used to get in touch with their creative forces through symbols.

The embrace of humanism in American psychology can be traced all the way back to William **James**, who was a consistent advocate of free will, and a consistent critic of those who would reduce human phenomena (e.g., religion) to a drive for food or sex.

In the 1930s Gordon **Allport** began as a critic of the limitations of both behaviorism and psychoanalysis. They both view persons as reactive, whether reacting to internal drives or external stimuli. Allport viewed **human behavior as proactive**, selecting responses according to certain guiding traits. A reactive perspective puts much weight on past causes that "push" the organism to action; Allport's proactive perspective puts the emphasis on future goals that create a "pull" when they tie in with the organism's motives and values.

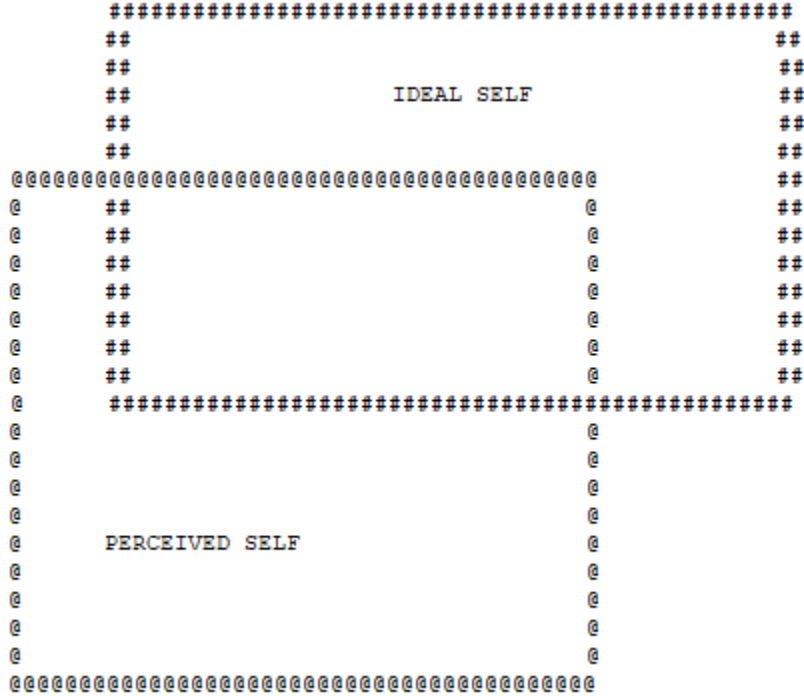
Allport appreciated individual differences: two very opposite backgrounds may produce similar personalities, or two similar backgrounds may produce radically different personalities: "boiling water softens a potato but hardens an egg."



Abraham **Maslow**'s pyramid of needs can also be considered humanistic. The self-actualized person demonstrates acceptance of self and others, spontaneity, autonomy, freshness of perspective, identification with all of mankind, democratic values, an ethical sense, a non-hostile sense of humor, and has peak spiritual experiences. The only reason that more people do not function on the level of self-actualization is that they are constrained by the lower levels of needs.

Psychotherapist Carl **Rogers** understood the central human problem as a lack of **self esteem**, which he termed an incongruence between one's ideal self and perceived self. The origin of this incongruence was in

early childhood with harsh parenting. Specifically, parents impose "conditions of worth" with subtext messages which the child interprets as "I love you when you are good, but when you are not good, you are not loved."



Comparison of personality theories				
	BEHAVIORIST	PSYCHODYNAMIC	COGNITIVE	HUMANIST
Main figure(s)	Watson Skinner	Freud	Rotter Adler	Adler Jung Allport Maslow Rogers
Main theme(s)	Stimuli	Sex and aggression	Conceptual maps	Striving for growth, congruence, individuation, actualization, social interest
Structure	Habits	Id Ego Superego	Interpretive	Whole Self
Role of unconscious factors	None	Great	None	Varies
Role of conscience	Reinforcer	Superego	Conceptual map	Ideal self, identification with humanity
Free will	No	No	Yes	Yes
View of human nature	Neutral	Unfavorable	Favorable	Very favorable
Barriers to growth	Bad habits	Unresolved conflicts	Dysfunctional cognitions	Low self esteem

QUESTION #10.6: What are projective techniques?

Personality tests such as the MMPI, 16PF, NEO 5, Myers-Briggs, and Locus of Control tests are referred to as "objective" because subjects choose specific answers that can then be quantifiably scored. By contrast, **projective techniques use vague stimuli** to elicit narrative or artistic responses from the subject.

When using a **Word Association Test** or **Sentence Completion**, we never know where the subject is going to go with the answer. Scoring the response is more complicated than just entering multiple-choice answers into a computer. The interpretive skill and theoretical orientation of the psychologist come in to play.

Some psychologists might have a child **draw a picture** of the entire family and after observing the drawing, make inferences about how the child perceives functioning relationships. Another technique is to have the child arrange toy figures in a sand tray, or to draw a house, a tree, and a person.

Dream analysis can be viewed as another projective technique. How the subject remembers the dream, and engages emotionally with it is a qualitative experience that cannot be reduced to numbers, but it may reveal much about what is really on the patient's mind, perhaps even

some unconscious conflicts. Freud, Adler, and Jung were very interested in dream analysis, but Allport and Rogers were not.

Henry Murray developed a **Thematic Apperception Test (TAT)**, a series of vague pictures that the subject is asked to view and tell a story about what is going on. The assumption is that the subject's own perceptions, motivations, and unconscious conflicts will end up being woven into the resulting story. The **Rorschach Ink Blot** test is similar, except that it uses a series of ink blots as the stimuli.

Compared to the "objective" techniques for personality assessment, the **projective techniques have lower rates of validity and reliability**. For example, there are four major scoring systems for interpreting Rorschach responses.

Consider the following dream reported by a fifty-year-old man on a business trip overseas.

"We were in the old house putting blocks of ice into my daughter's bedroom as a sort of air conditioning system. Then a man was talking. I identified him as my father, but he had a long, thin face, short dark hair combed back, and spoke with a strange speech impediment. He said he had been dead for twelve days, but they had brought him back to life, and then he could smell the 'six fumes'. He kept saying 'ten to Hartford' but it was hard to understand him."

A psychoanalytic approach would seek evidence of an unresolved Oedipus Complex. Does the daughter symbolize the mother (one generation in the other direction)? Does bedroom symbolize sex? Does the cooling system represent a defense mechanism for cooling lustful passion? Was the long thin face with the hair combed back a phallic (penis) symbol? Was the subject's reported fear that his father was dead merely a reaction formation disguising his real unconscious wish that his father be dead? Is the mention of the "six fumes" just a garbling of "sex rooms" or "sex dooms"? Was "ten to Hartford" really "I am tempted to hurt you"?

The approaches of Adler, Jung, and other humanistic therapists would focus more on how the dreamer is able to use the dream to express his own concerns and foster his own growth of potential (unlike the psychoanalytic approach which would accuse the dreamer of denial if he did not accept the psychoanalytic interpretation). Adler and Jung would probably view this dreamer as a very healthy individual, given his sincere concern for father and daughter.

Although this particular dreamer does not believe that dreams have any precognitive capacity, it very much upset him. As soon as he woke up, he began to do the calculations. It was about 6 AM where he was in Europe when he had the dream, about midnight (10 + 2) Eastern Time, in Hartford, CT. Then he thought it might be a date: October the 2nd in Hartford. Perhaps an address, like maybe 1002 Hartford Avenue. Or maybe a bus or flight number ten bound for Hartford. Or maybe a preference: "tend to hot food." Then he remembered that he had just switched his company's insurance service to a new provider "tend to the Hartford." One of his biggest worries was possible action by the Environmental

Protection Agency on some toxic waste sites owned by his company "the six fumes." The dreamer also disclosed that he frequently dreams about old houses he has lived in, and enjoys these dreams very much. In his dreams, the houses are usually larger or more elegant than they were in real life, sometimes with new and mysterious rooms that he has never explored. The houses are being used as a symbol for his conception of self, which is constantly being improved. Despite his own challenges, and those of his company, his major concern is the well being of his family (both his children and his parents). "Dead for twelve days" could refer to the anticipated length of his trip abroad, and that he feels dead without his family.

<i>Psychological assessment</i>		
	Objective	Projective
	<i>Paper & pencil</i>	<i>Vague stimuli</i>
Long	MMPI 16 PF NEO 5 Myers-Briggs	Rorschach ink blot Thematic Apperception
Short	Rotter Locus of Control Adjective checklist	House-Tree-Person Sentence Completion Word Association Dreams

UNIT 11: CLINICAL

QUESTION #11.1: What is mental illness?

Abnormal psychology (psychopathology) is the branch of psychology specializing in mental disorder (mental illness). In the broadest sense, mental disorder is defined as behavior that is maladaptive, i.e., conduct that is dysfunctional or harmful to self or others.

Mental health professionals who work in this area come from a variety of professions: medicine, psychiatry, social work, and nursing.

Psychiatrists are medical doctors with residency training and board certification in the specialty of treating mental disorders. As physicians, they **can prescribe medication**. Those psychologists who work in the field of mental health are those in the **clinical** branch, and must have a doctoral level degree and state licensure.

Insanity is a term now used only in a **legal** context to refer to a judgment that a person is not to be considered mentally capable of managing his own affairs, or be held legally culpable for his actions. Standards for a legal judgment of insanity vary from state to state. Some jurisdictions rely heavily upon the testimony of mental health professionals that a specific mental disorder is present, while other jurisdictions stick to older legal standards, such as "did the person, at the time that he committed the act, have an understanding that it was wrong?"

Case Study: Mr. W, at age 77 was declared "not competent" to manage his own affairs. This happened after he had set fire to his house, and was wandering around dazed when the fire fighters arrived. After talking with neighbors and his physician, the court suspected a case of dementia, and so Mr. W was not charged with the crime of arson. He was sent to a nursing home, and his closest relative, a nephew, was appointed conservator of his estate.

Diagnosis (plural, **diagnoses**) is the process of observing the patient's **symptoms, and inferring the most likely underlying disorder**. Other sources of relevant data from the patient might include the patient's own description of the problem, the views of other family members, background case history, and what other mental health professionals have previously diagnosed or prescribed. The results of psychometric tests (e.g., the MMPI) and laboratory results should also be included.

OBSERVATION	INFERENCE
Symptoms Self-description Family's description Background Previous prescriptions Lab tests Psychometric test scores	Diagnosis

Case Study: Mr. W's main symptom was a lack of orientation. He was confused about where he was, when it was, and with whom he was speaking. His own description of his problem is that he was worried about the terrorists stealing his old schematic diagrams. (This did not seem plausible, for although Mr. W was a retired aeronautical engineer, he had not designed a plane for twenty years, and was not in the possession of any classified documents.) Mr. W's neighbors said that he had grown increasingly withdrawn over the past year, and that his wife seemed to be in charge of handling his affairs. When she died two months ago, he let the garden go, failed to pick up the mail, and became more suspicious about everyone. His physician reported that Mr. W had scored poorly on the Mental Status Questionnaire, a test for short term memory, and had prescribed a low dose of Aricept, which is intended to slow down the progression of dementia. A psychologist used a battery of other psychometric tests indicative of dementia, and confirmed the diagnosis.

Diagnostic validity and reliability have been greatly improved since 1952 when the American Psychiatric Association issued its first **Diagnostic and Statistical Manual** that is the accepted guideline. Now in edition **DSM-5**, mental disorders are listed along with the specific criteria for a patient to be labeled as having that disorder.

Prognosis (plural, prognoses) refers to a prediction about the course of the disorder over time. Factors to consider in prognosis might be the usual natural course of the disorder, the unique background of the patient, social support and coping abilities, the usual effectiveness of the prescribed treatment, the patient's own previous response to treatment, and how well the patient is likely to comply with it.

OBSERVATION	INFERENCE
Background Coping skills Social support Course of disorder Previous response to treatments Usual effectiveness of treatment Patient compliance with treatment	Prognosis

Case Study: Mr. W's prognosis was poor: it was extremely unlikely that he would make a full recovery to his former state of mental health. This is based upon the fact that the natural course of most forms of dementia is steadily downward until death. Aricept and other medications at best slow the decline. Mr. W had already been given a prescription, but it had obviously not helped him. His greatest source of social support, his wife, was now gone.

Epidemiology refers to the investigation of diseases in a population, both the incidence (current level), and prevalence (lifetime occurrence). Diseases can be **acute** (intense, with rapid onset) or **chronic** (gradual onset, long standing) or **episodic** (those disorders which come and go).

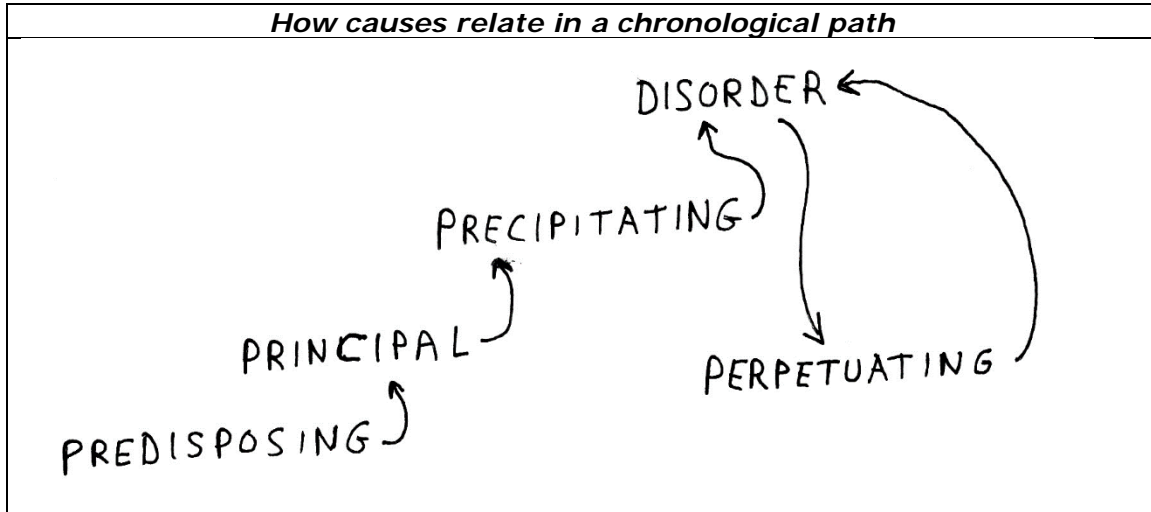
We rarely use the term "cure" when speaking of mental disorders, but rather the **remission** (cessation) of symptoms. When we evaluate a treatment, we look at how complete the remission, how rapid, and how resistant to relapse.

Etiology refers to the origin or causal nexus of disease. Some causes are essential (necessary) to produce their effects: without the cause, the effect cannot be produced. Some causes are adequate (sufficient) to produce their effects: whenever the cause exists, the production of the effect is guaranteed. Some causes are both adequate and essential, while most are merely contributory in that they make the event more likely to occur.

Any mental disorder can be analyzed in terms of four types of causes. **Principal** causes are those that have the most impact. They are usually essential and sometimes adequate. **Predisposing** causes are found in the distant background (e.g., heredity, early parenting, culture), and make the patient more susceptible or vulnerable or "at risk" for certain disorders. These predisposing causes are sometimes essential, but never adequate. Indeed, many individuals with these predisposing backgrounds do not get the disorder, but demonstrate great resilience. **Precipitating** causes are those that occur just before the disorder and trigger it. They are never adequate, and only rarely essential. Environmental stress usually has only a precipitating role in most mental disorders. Those things that occur after the onset of the disorder, but tend to perpetuate it in a vicious cycle, are known as **perpetuating** (or reinforcing) causes. They are neither essential nor adequate, but can contribute much to sustaining the cycle.

Comparison of causes of mental disorder				
<i>Cause</i>	<i>Essential?</i>	<i>Adequate?</i>	<i>Role?</i>	<i>When in sequence?</i>
PRINCIPAL	Usually	Sometimes	Major	Sometime before onset
PREDISPOSING	Sometimes	Never	Minor	Early
PRECIPITATING	Sometimes	Never	Minor	Just before onset
PERPETUATING	Never	Never	Varies	After onset

Case Study: Mr. W's disorder was his confused behavior. There was probably no specific predisposing cause with any important role in this case (although there is a genetic predisposition to develop some dementias). The principal cause was a chronic brain syndrome, probably Alzheimer's (a post-mortem autopsy would be required for confirmation). The precipitating cause would be the recent death of his wife, which made his confusion more difficult to cope with or hide. His suspicious and belligerent behavior also served the role of a perpetuating cause, deterring his neighbors from having a closer relationship and offering more help.



There are several theoretical models for understanding the principal cause of mental disorders.

MAGICO-RELIGIOUS: This is the oldest model, found in many tribal societies before the development of the modern sciences of biology, chemistry, and psychology. The view of the world is animistic: every being and object has a living spirit or soul that determines its action. Depression might be considered a loss of soul, schizophrenia as possession of an evil spirit. The usual solution is exorcism, a ritualistic expulsion of the evil spirit.

THE CAUSE OF MENTAL ILLNESS (magico-religious viewpoint)

cause

effect

DEMONIC

POSSESSION =====> EMOTIONS, BELIEFS, BEHAVIORS

BIO-MEDICAL: This neuroscience perspective began with Hippocrates and Galen who argued that human behavior was determined by the brain, nervous system, and bodily fluids. This model emphasizes the necessity of diagnosing specific diseases. Hippocrates classified disorders into dementia, frenzy (schizophrenia, mania), and melancholia (depression).

He also looked for physical treatments: medicines, surgery. Major advances in this perspective came in the last three centuries with the advance of organic chemistry and **pharmacology** (the development of medications).

About a hundred and thirty years ago **Emil Kraepelin systematically classified all psychiatric disorders**. This facilitated bio-medical research on one disorder at a time, emphasizing genetics and chemical imbalances. The disorders that clearly fit this model include dementias such as Huntington's and Alzheimer's. With the introduction of effective psychiatric medications, this model has come to predominate in contemporary psychiatry.

THE CAUSE OF MENTAL ILLNESS (bio-medical viewpoint)

cause *effect*

ANATOMY &
METABOLISM =====> EMOTIONS, BELIEFS, BEHAVIORS

PSYCHOTHERAPEUTIC: This model views the mind as having important internal (e.g., unconscious) and external (e.g., interpersonal) relations. Some of the early humanistic reformers have fed into the modern psychotherapeutic model: the medieval shrine for the mentally ill at Gheel, Pinel in revolutionary France, Dorothea Dix in 19th century America, Tuke in England, Bucke in Canada. They shared the view that people, even those mentally ill, were deserving of kind treatment, and would probably improve more rapidly with such an approach. Modern psychotherapists such as Alfred Adler, and Carl Rogers have shared this view. Another root of the psychotherapeutic approach would be those who see the unconscious as a fearful repository that can distort an individual's behavior and relationships: Charcot and **Freud** (psychoanalysis). The psychotherapeutic approach frequently emphasizes attacking defense mechanisms and provoking a catharsis (purifying release of stored up emotions). This model dominated at mid-century: psychoanalysis from 1930-1960 in American psychiatry and psychotherapy, the humanistic approach in American psychotherapy 1960-1980.

THE CAUSE OF MENTAL ILLNESS (Freud/Gestalt/Rogers)

cause *effect*

EMOTION =====> BEHAVIORS, BELIEFS

BEHAVIORAL: This model says that behaviors are learned, due to conditioning (Pavlov, Watson, Skinner). Since the background of the founders was more in the area of experimental psychology, it took awhile for clinicians such as Mary Cover **Jones** and James Wolpe to suggest possible therapeutic applications of conditioning and other forms of learning. Only a few mental disorders (e.g., phobias like Little Albert's conditioned fear of the mouse) neatly fit the model.

THE CAUSE OF MENTAL ILLNESS (Behaviorist viewpoint)

cause effect

BEHAVIORS =====> BELIEFS, EMOTIONS

COGNITIVE: This approach focuses on the role of the patient's interpretations and expectations (thoughts) in generating and sustaining the emotions (e.g., Beck, Ellis). This approach offers one (among many) useful understanding of depression, and has grown in favor among psychotherapists since 1980.

THE CAUSE OF MENTAL ILLNESS (cognitive viewpoint)

cause effect

BELIEFS =====> EMOTIONS, BEHAVIORS

SYSTEMS: This approach emphasizes the role of the culture and especially family dynamics. It may explain such diverse disorders as running amok in Malaya, and anorexia in the U.S. This systems model has become increasingly popular among social workers and family counselors.

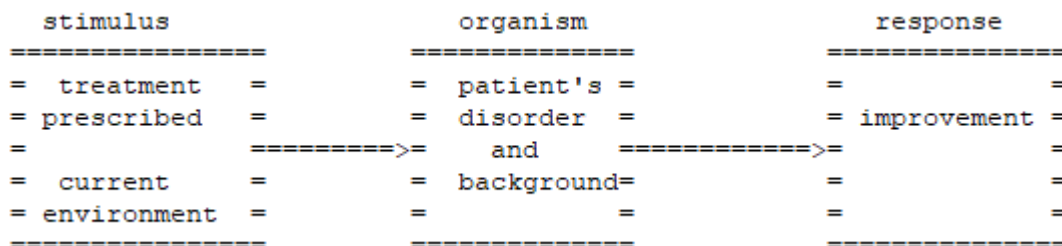
THE CAUSE OF MENTAL ILLNESS (systems viewpoint)

cause effect

CULTURAL
NORMS AND
FAMILY =====> EMOTIONS, BEHAVIORS, BELIEFS
INTERACTIONS

Models of mental disorder				
Model	Advocate(s)	Main theme	Disorders explained	Started
Magico-religious	Ancient	Spirit possession	Depression Dissociative	Pre-historic
Bio-medical	Hippocrates Kraepelin	Structural or metabolic abnormalities	Depression Dementia Delirium Schizophrenia	1860s
Psycho-therapeutic	Freud Adler Rogers	Difficulties In childhood	Depression Dissociative Anxiety	1900s
Behavioral	Jones Wolpe	Conditioning	Depression Anxiety	1960s
Cognitive	Beck Ellis	Irrational expectations And inferences	Depression	1970s
Systems	Social work Family Counselors	Dysfunctional group relations	Depression Dissociative	1970s

Many mental health professionals now regard themselves as **eclectic**, drawing from several of these perspectives, depending upon the unique characteristics of the case at hand. One of the advantages of an eclectic approach is that it can yield a variety of insights into which principal or perpetuating cause might be targeted by therapeutic intervention to help this patient at this time.



QUESTION #11.2: What are the main psychiatric treatments today?

Since the 1950's, the use of **psychotropic medications** has become the **most widespread treatment** for most mental disorders. This is because these medications are relatively cheap and relatively effective. The introduction of these medications made possible the out-patient treatment of thousands of patients who would otherwise have been institutionalized in mental hospitals. Even for those patients who still needed to be hospitalized, the advent of the medications greatly reduced the need for straight jackets and other physical restraints and meant that more patients could be trusted with razors, mirrors, tools, and craft materials.

number of		X	
patients in	X	X	
mental	X	X	X
hospitals	X	X	X
	1940	1955	1970

These psychiatric drugs should not be confused with illegal street drugs, with their risks of habituation, dependence, and addiction. Only a few psychiatric medications (e.g., benzodiazepines) pose these risks. A greater problem in practice has been securing patient **compliance: making sure that patients keep on taking their medication** once they have been released from the hospital.

The specific side effects of these medications differ greatly depending upon the medication and the patient. Side effects can stretch the continuum from very serious neurological damage (e.g., the Parkinson-like **tardive dyskinesia** of the phenothiazines) to the merely discomforting (e.g., the dry mouth of the tricyclics).

Anti-psychotic medications are known as the major tranquilizers (e.g., phenothiazines). These are prescribed for treating the symptoms of schizophrenia (e.g., delusions, hallucinations, violent behavior) but can also be used with such behaviors in dementia and mania. These medications may carry a risk of side effects with long term use (e.g., tardive dyskinesia). Newer anti-psychotic medications (e.g., risperidone) have different side effect profiles from the older anti-psychotics (e.g., Thorazine, Haldol).

Anti-anxiety medications are also known as minor tranquilizers (e.g., benzodiazepines). These are prescribed for treating physical symptoms of anxiety. They are quick acting, but carry some risk of addiction. Newer anti-anxiety agents (e.g., Buspar) may have less addictive risk, but their effectiveness and side-effect profile must be matched to the individual patient.

Anti-manic medications are mood stabilizers (e.g., lithium) that are appropriate for mania and bipolar disorders. They take about four weeks to work and have to be carefully monitored to be sure that the dosage is sufficient without compromising liver or kidney functioning. Newer mood stabilizers (e.g., valproate) may have less renal and hepatic risk, but must be matched to the needs and limits of the patient.

Anti-depressant medications are in three main families. Monoamine oxidase inhibitors (MAOIs) have been around since the 1950s, and have a variety of side effects and dietary restrictions. Heterocyclics (e.g., Elavil) have side effects such as dry mouth. Selective serotonin reuptake inhibitors (**SSRIs**) have been around for a quarter of a century and are the most popular (e.g., Prozac, Zoloft, Paxil). More new anti-depressants come on the market each year. All of these anti-depressants have about 70% effectiveness, and take about four weeks to work. The difference is in their pattern of side effects. The good news is that if one anti-depressant does not appear to be effective, or if it has distressing side effects, another can be tried.

The important thing to keep in mind with all psychiatric medications is that the patient must stay on the schedule and dosage prescribed, and if any problems occur, confer with the physician so that the dosage or medication can be changed.

Case Study: Ms. R, at age 19 became very depressed. She was placed upon Prozac, which lifted her depression in four weeks. After six months, she decided to go off the medication, and remained fine for eight years. At age 27, depression returned. She went back on the Prozac, which kicked in a month later, but her behavior became more bizarre. Upon re-examining Ms. R (and discovering a family history of manic-depression), her physician switched her to lithium. Ms. R now enjoys a stable mood. If she were to adjust her dosage, or go off of her medication without her physician's consent, she would be running the risk of depression or mania.

Electro-convulsive Therapy (ECT) is also known as "shock treatment." It has been around since the 1930s, and is probably the most researched of all psychiatric treatments. It is **appropriate for severe depression** and catatonia. It is relatively rapid (e.g., about a week), effective, and safe.

The team administering ECT usually includes a psychiatrist, anesthesiologist and nurse. Patients are given injections of muscle relaxants in order to reduce physical expressions of the convulsion (and to prevent fractures of the vertebra). In order to protect the teeth and tongue, a plastic protective block is inserted prior to turning on the current. The voltage is that of wall current, but is only applied for a fraction of a second. Convulsions then occur, and may last up to a minute. The patient regains consciousness in a few minutes, but may not be fully alert and able to leave the treatment area for an hour. During this recovery period the patient may be confused and experience a headache.

ECT is not the dangerous procedure that some people imagine. Deaths occur in less than four in 100,000 cases. (This is equivalent to the death rate for general anesthesia without ECT.) Conditions that are considered to be contraindications are brain tumor and postpartum depression. Age, cardiovascular problems and pregnancy are not generally regarded as contraindications, but many child psychiatrists may question the use of ECT with pre-adolescents.

One limitation is that ECT is not a permanent cure. There is always the danger that the patient might become depressed again. While this is true of medication and psychotherapy, the relapse rates seem to be higher for ECT. (Perhaps this is influenced by the fact that ECT only gets used on the most serious cases in the first place.)

The most frequently reported side effect of ECT is memory loss, both in the form of retrograde amnesia (especially for what happened just before the ECT was administered) and anterograde amnesia. Almost half of ECT patients complain of memory impairments right after treatments, but this only lasts a few weeks. Newer procedures for administering ECT (multiply monitored micro-seizures) may reduce memory loss.

Case Study: Mr. N, age 68, became depressed after retirement at age 64. He was placed on a heterocyclic medication, and responded after four weeks. After five months he went off the medication, and felt fine. Last year, his wife died, and his depression returned, and became even more severe. He did not respond to the medication, and constantly thought about suicide. After six ECT sessions, he was able to return home and participate in group psychotherapy.

The greatest problem with ECT is not that it is cruel or barbaric, but that the general public regards it as such. (Although the patient experiences no pain in the procedure, the clouded consciousness of the recovery period is not pleasant.) A few states have reacted by putting obstacles in the path of ECT. Many community, private, and even teaching hospitals do not perform ECT.

A new treatment which also uses electricity to change the brain's functioning is Transcranial Magnetic Stimulation (TMS). It also seems to be effective on severe depression, but does not require anesthesia or hospitalization. TMS may also have a lower risk of amnesia.

Psychosurgery involves cutting the brain in order to change the patient's emotional processing. Back in the 1930s Moniz developed the primitive **pre-frontal lobotomy** that severed the connective tissues between the thalamus and frontal lobe. This generally reduces the overall level of emotionality of the patient. Most lobotomized patients remain institutionalized, but are more manageable. In rare cases, the improvement is so substantial that the patient may return home. Modern forms of psychosurgery are more targeted to specific disorders and have a better prognosis, but this treatment has become very rare in this country, due to the effectiveness of psychotropic medication.

Case Study: Mr. K, now age 74, was diagnosed with schizophrenia and institutionalized in his 20s. His tendency to be violent led to a lobotomy at age 40. He was transferred to a private, locked, nursing home when the state mental hospital closed down. He is docile and manageable, never getting upset about anything for more than a few seconds. He spends most of the day just walking around the facility in a set course.

Patient response to medication, ECT and psychosurgery is not distributed like a bell curve. If patients respond, the response tends to be marked and the patient experiences substantial symptomatic relief. If the patient is a non-responder, that is usually obvious in the first couple of weeks. Semi-responders are rare: the treatment works or it does not. About two-thirds to three-quarters of patients respond well to medication. For ECT and psychosurgery the rates approach 90 percent.

Comparison of somatherapies for mental illness				
Treatment	Type	Assumes	Effective on	Disadvantages
Lobotomy	Surgery	Disorder is in the structure of the brain	Lowering level of emotion	Irreversible
ECT	Shock	Disorder is metabolic	Depression (1-2 weeks)	Relapse
MAOIs (e.g., phenelzine)	Pharmacology	Disorder is metabolic	Depression (3-5 weeks)	Side-effects serious
Tri-cyclics (e.g., Elavil)	Pharmacology	Disorder is metabolic	Depression (3-5 weeks)	Side-effects bothersome
SSRIs (e.g., Prozac)	Pharmacology	Disorder is metabolic	Depression (3-5 weeks)	Side-effects rare, mild
Anti-psychotic Phenothiazines (e.g., Thorazine)	Pharmacology	Disorder is metabolic	Psychotic symptoms	Side-effects neurological
Anti-psychotic Atypical (e.g., Clozaril, Risperdal)	Pharmacology	Disorder is metabolic	Psychotic Symptoms	Side-effects potentially serious
Anti-manic (e.g., lithium)	Pharmacology	Disorder is metabolic	Mania, bipolar (3-5 weeks)	Side-effects nausea
GABA antagonists (e.g., valproic acid)	Pharmacology	Disorder is metabolic	Mania, bipolar (3-5 weeks)	Side-effects
Anti-anxiety benzodiazepines (e.g., Valium, Xanax)	Pharmacology	Disorder is metabolic	Anxiety	Addictive
Anti-anxiety Other types (e.g., Buspar)	Pharmacology	Disorder is metabolic	Anxiety	Side effects minimal

Because medications are so widespread and effective today, the need to resort to treatments like ECT and lobotomy has lessened. Several states (e.g., California) have imposed legal hurdles that must be cleared before patients can be treated with ECT or lobotomy.

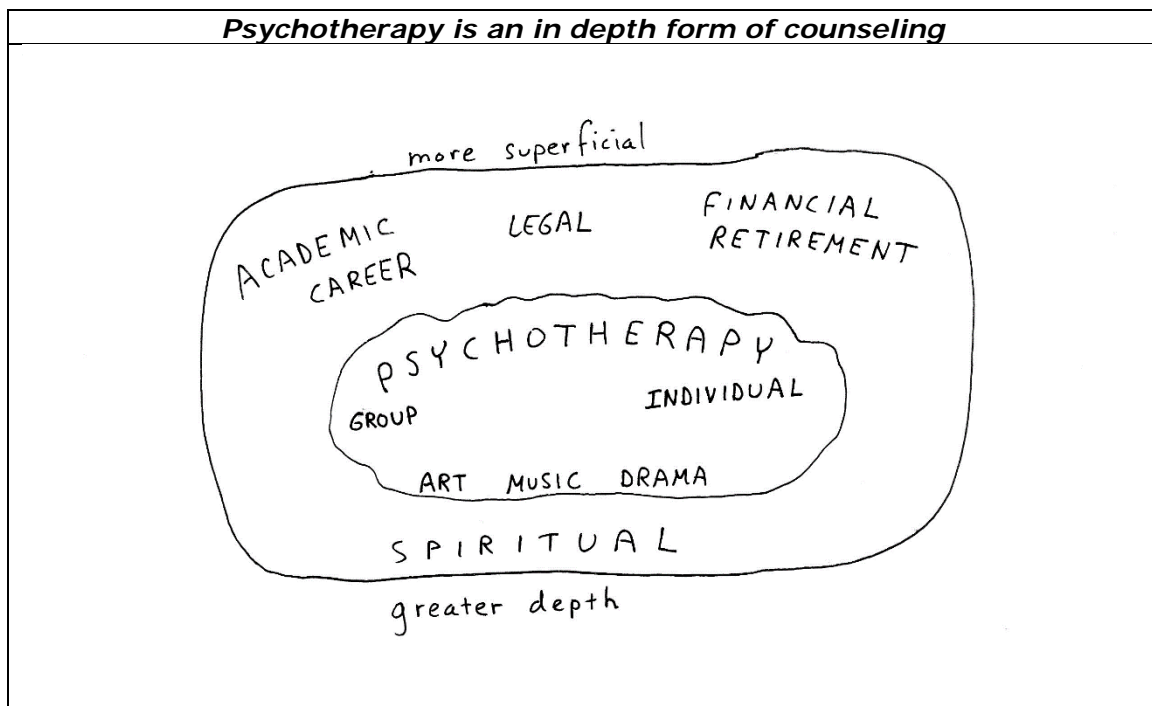
Ideally, a patient who is receiving medication (or ECT) should also be receiving some form of psychotherapy, but in practice, many insurance plans may not cover any treatment beyond the medication.

QUESTION #11.3: What is psychotherapy?

Psychotherapy involves communication between a patient and a therapist, individually or in a group, verbally or non-verbally.

P S Y C H O T H E R A P Y
 A E
 L A
 K R

At the very middle of the word "psychotherapy" are the letters T and H and they stand for talking and hearing, the kind of communication that goes on in psychotherapy.



Psychotherapy is a specialized form of counseling. All counseling tries to help the client (patient). In the more superficial forms of counseling, we assume that the client is a responsible adult, capable of making her own decisions, and is only in need of expert information. In deeper forms of counseling, we assume that more than mere information might be necessary. The patient may need to grow and change. This is sometimes understood as insight into self motivation, release of distressing emotions, or the learning of new coping skills.

Psychodynamic approaches to psychotherapy emphasize the techniques of **Freud**. The patient free associates, just saying whatever comes to mind, and the therapist listens, occasionally offering an interpretation. The patient is encouraged to bring in a dream, and after awhile, this may come to dominate the therapy sessions. Whenever the patient cannot

continue on in the process of free association, or cannot answer a question, or rejects an interpretation posed by the therapist, this is termed a resistance, which itself becomes a further topic for discussion. Sessions of fifty minutes long take place at least once a week, and the median time for completed therapy is two years. This long term relationship with the therapist will evoke powerful emotions that the patient transfers onto the therapist (Oedipal transference) and this becomes a yet another topic of conversation. This treatment can be effective in depression, anxiety, obsessive-compulsive, conversion, and dissociative reactions. It seems to work best with patients who are intelligent, educated, and fluent. Psychoanalysis dominated American psychotherapy and psychiatry until about 1960, when medication use became widespread.

Freud offered several explanations for why his therapy worked. Early in his career, he emphasized **catharsis**: that therapy lets off the drive pressures of the unconscious within the safety of the therapeutic relationship. Later, he developed more of an insight model: during therapy, the conscious self, the ego, comes to understand the origins and dynamics of the patient's problems. In his later years, Freud seemed to view psychoanalysis as a process of strengthening the ego so that it can take over the role of controlling the drives of the id, so that the superego's need to repress is diminished.

Case Study: Ms. G was born in 1925 on a farm in what was later to become Silicon Valley. She earned a degree from the state university and hoped to become a newspaper reporter. Upon graduation from college she married her old high school sweetheart, who had just graduated with a degree in civil engineering. He became a very successful homebuilder. Over the next five years they had three children (the last two pregnancies were due to contraceptive failure). She tried to count her blessings: good husband, three beautiful kids, big house, new station wagon, but she was becoming miserable and irritable. She hated hauling the kids around to school, ballet, music lessons, scouts, 4-H, Little League. She called up the psychiatry department at Stanford and got a referral. This was the 1950s, so the main form of psychiatric treatment was psychoanalysis. During the first few weeks, she said very little, but just reclined upon the couch and cried. The psychoanalyst did not push her to pull herself together or to try to talk sense. He allowed her time. After a while, the words came, and she was able to review her own childhood and her current frustrations. After about a year, she said that she had had enough therapy. She told her husband that they would be hiring a chauffeur to drive the kids around. She called up the local newspaper and volunteered her services as a reporter (which eventually worked into a high level position). Ms. G is to this day convinced that her psychoanalysis was one of the most important growth experiences in her life. She is the kind of intelligent and articulate person who is most likely to benefit from the process.

Carl **Rogers** developed a form of therapy that became known as **client-centered or person-centered**. This approach is **non-directive**: the therapist attempts to avoid making an interpretation. The goal is to get the patient in touch with his or her feelings. The basic technique is for the therapist to demonstrate empathy (reflecting the patient's

emotions) and "unconditional positive regard" for any emotion that the patient might express. This is not the same thing as positive reinforcement, but a permissive environment in which the patient comes to realize that he can say anything, and express any emotion, without being harshly criticized by the therapist. This form of therapy usually takes several months. The similarities with psychoanalysis probably outweigh the differences. In both forms of therapy, the focus is on getting in touch with buried emotions in a safe therapeutic context. Client-centered therapy is effective with the same conditions that psychoanalysis works with: depression, anxiety, obsessive-compulsive, conversion, and dissociative reactions. It also seems to work best with patients who are intelligent, educated, and fluent. Starting in the 1960s, Rogers became the main figure in American psychotherapy.

Other forms of humanistic therapy (e.g., existential, Gestalt) are generally similar to Rogers' in their assumptions and techniques.

Gestalt therapy, developed by Fritz **Perls**, also assumes that repressed emotion is at the core of adult neurosis. It aims for a more direct and immediate catharsis for a growth experience. One technique is direct confrontation when the patient uses defense mechanisms. This can yield a more rapid remission of symptoms, but relapse rates can be higher.

Cognitive approaches to therapy can be traced back to Alfred **Adler** who sought to identify the patient's guiding fictions because they reinforced inferiority feeling and served as stumbling blocks to the development of social interest. In the 1960s Albert **Ellis** identified a list of irrational thoughts, and developed a form of Rational Emotive Therapy to challenge those thoughts. This seems to work rapidly with minor depression and anxiety. The predominant approach to cognitive therapy today is that developed by Aaron **Beck**. It is widely regarded as a **treatment for depression** that is highly effective, quick acting, and resistant to relapse. It involves structured homework assignments in which the patient begins to identify thoughts that trigger depressive emotions.

Case Study: Mr. C, age 50, had suffered from bouts of depression throughout his life. In college, he had received four months of client-centered counseling, and that seemed to lift his spirits. When he hit 30, his first marriage was cracking up, and it was unclear whether his depression was the result of the marital problems, or whether the marital problems were the result of his wife not being able to put up with his depression. He stayed on Elavil for three years, and this helped him get through an amicable divorce. At age 46 his depression returned, and he immediately sought help. Prozac worked for about 15 months, and then it was coming back. He found a cognitive therapist and was amazed at how directive the approach was (compared to what he remembered about Rogerian, client-centered therapy). After a few weeks his depression had lifted, and his therapy terminated. With his physician's approval, he stopped taking this medication, and has suffered no relapse. Mr. G credits the insights he got from cognitive therapy for really turning his life around.

<i>Comparison of psychotherapy schools</i>				
Treatment	Main figure	Assumes	Effective on	Timeframe
Psychoanalysis	Freud	Disorder is emotional	Anxiety Depression Dissociative	Months or years
Non-Directive Client-centered Person-centered	Rogers	Disorder is emotional	Anxiety Depression Dissociative	Months
Cognitive	Beck Ellis	Disorder is thought based	Depression	Weeks

Ideally, a patient who is receiving medication (or ECT) should also be receiving some form of psychotherapy, but in practice, many insurance plans may not cover any treatment beyond the medication.

The effectiveness of psychotherapy may follow more of a bell curve, with the majority of the patients getting at least moderate benefit in most forms of psychotherapy.

QUESTION #11.4: What is behavior modification?

Behavior modification, or behavior therapy, had its origins in conditioning. These techniques have been applied clinically for only about fifty years. They tend to work fast (three to twelve sessions), be highly effective (achieving desired results in 90% of the cases) and have low rates of relapse.

Positive reinforcement targets a skill deficit (e.g., speech in autistics) and schedules reinforcers to increase the desired behavior. The practical difficulties involve identifying an appropriate reinforcer (e.g., food) and then controlling the patient's environment in such a way that the only way to get the reinforcer is to exhibit the desired behavior. **Token economies** in institutions give the patients points on a punch card when they engage in behaviors such as turning in laundry and showing up for group therapy, and then these points may be exchanged for such things as videos or candy. **Biofeedback** uses monitoring of physiological processes to provide a tighter feedback loop for the conditioning of physiological responses, and is useful in panic attacks, migraines, and stress reduction.

Non-reinforcement is used to extinguish undesirable behaviors. Once again, the practical problem is to gain control of the patient's environment to make sure that the undesired behavior is not reinforced.

Case Study: Ms. T, 80, is a widow perhaps in the earliest stage of dementia. She has developed the delusion that her neighbors are stealing her possessions and her mail. Each night on the telephone, she talks to her daughter and makes charges, such as "Today, I noticed that they took my good new garden hose, and replaced it with an old leaky one." When the daughter tried to explain that maybe her hose was getting old, and she just did not notice it, the mother got angry and

came up with additional complaints. The psychologist consulted by the daughter examined Ms. T, and suggested that in the near future it might be necessary to relocate the mother, because her ability to live alone might be fading. In the meantime, he suggested that the level of complaints could be reduced by non-reinforcement. Whenever the mother started to make one of those complaints, the daughter was to find an excuse to hang up, and not call back. Over the next week, the phone conversations were pretty short, not like the usual forty minutes to an hour, because the daughter hung up as soon as the mother started on one of her diatribes. By the next week, the mother was waiting ten or twenty minutes before she brought up a complaint. After two weeks, the mother no longer came up with these charges over the phone, because they no longer obtained attention or sympathy.

Flooding (implosive therapy) is used to treat phobias and related disorders (e.g., obsessive-compulsive). It subjects the patient to the full force of a feared stimulus. One who is obsessive-compulsive about cleanliness might be told to handle dirt. Getting the patients to comply with the treatment is the hard part, but if they do, most will overcome their irrational fear in short order.

Case Study: Ms. T, 25, was rising rapidly in the marketing department of a major corporation. She knew that she would have to make some major presentations in front of large audiences. She had always feared public speaking. At one recent department meeting, which was small by comparison, her Power Point presentation did not work properly and she became extremely anxious. Since that time she has feared that speaking in front of a large audience would make her vomit. Her therapist brought her to a large empty auditorium, and had her walk up to the stage, imagining all the bad things that could happen, and then try as hard as she could to vomit. When she realized that she could not make herself vomit, she overcome the fear of vomiting, and was able to accept the presentation assignments.

Systematic desensitization is another way to approach the feared stimulus, in a series of baby steps, small successive approximations, each one done in a relaxed state. This is probably the treatment of choice on most phobias. Here are the steps that might be used to treat a fear of heights.

SYSTEMATIC DESENSITIZATION OF ACROPHOBIA

1. master deep muscle relaxation
2. construct a hierarchy of feared stimuli approximations
3. work through the hierarchy while in a relaxed state
 - outside on the roof of a tall building
 - inside looking out the window of a tall building
 - on roof of house
 - on fifth rung of ladder
 - on fourth rung of ladder
 - inside on second story, looking out of a window
 - on third rung of ladder
 - on second rung of ladder
 - on first rung of ladder
 - on footstool
 - standing on a book

Reciprocal inhibition is where an opposite response is modeled and reinforced to take the place of a dysfunctional response to a stimulus. Assertiveness training is an example of a different way to respond to feared social situations.

Aversive conditioning is the systematic provision of punishment in order to suppress an undesirable behavior.

Case Study: Mr. S, now 54, picked up smoking when he was in high school. When he was thirty, he went through a behavioral program emphasizing aversive conditioning. He received mild but painful electric shocks every time he took a puff. This suppressed his smoking for several months, but when things got particularly stressful at work again, he went back to smoking. Last year he began participating in a new program to end smoking at the Veterans Hospital. He received an anti-depressant medication (Wellbutrin) in addition to group psychotherapy, and behavioral modification. He stopped smoking in three weeks and has not returned to cigarettes.

Today many therapists combine behavioral techniques with psychotherapeutic techniques, especially those of cognitive therapy. Some of the more traditional psychoanalytic and humanistic approaches have not figured out how to integrate the behavioral processes. This may be due to a basic philosophical difference as to how to view the patient's suffering. Those who advocate medication, behavior mod, and cognitive therapy usually advocate symptomatic relief: target the specific symptoms that are distressing the patient and alleviate the suffering. Many traditional psychotherapists (e.g., psychoanalytic and humanistic) prefer to view suffering as only the surface effects of deeper, underlying causes (perhaps stretching back to early childhood). Rather than seek a "quick fix" of removing the distressing symptoms, these psychotherapists hope that the deep levels of suffering will help the patient work through denial and facilitate growth experiences.

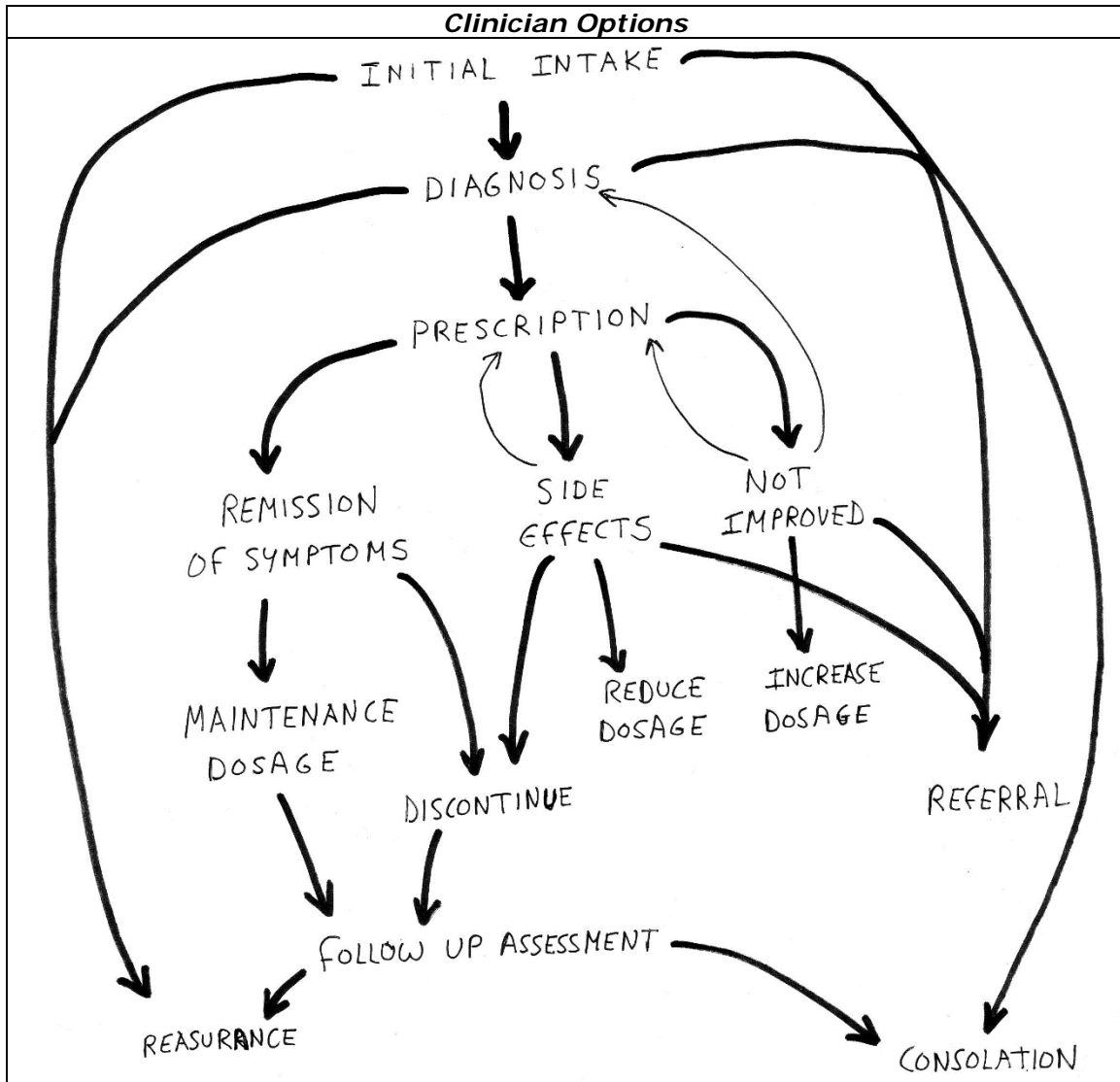
Comparison of behavior treatments for mental illness				
Treatment	Type	Assumes	Effective on	Disadvantages
Aversive conditioning	Behavioral Modification	Behavior can be suppressed	Bad habits	Painful
Extinction	Behavioral Modification	Behavior will cease when reinforcement is removed	Bad habits	
Token economy	Behavioral Modification	Behavior will increase when reinforced	Ward behavior	
Modeling	Behavioral Modification	Behavior will be adopted when shown	Phobia	
Systematic desensitization	Behavioral Modification	Disorder is conditioned	Phobia	
Flooding	Behavioral modification	Disorder is conditioned	Phobia	Scary

Case Study: Mr. S, age 31, had a hard time getting a job or making friends, because of his great shyness. At age 23 he spent four months in client-centered therapy, where the therapist kept urging him to get in touch with his inner child, but S said that he was in touch with that frightened child, and that was the problem. Even hypnotic regression did not bring relief. Mr. S quit going because he was convinced that he was disappointing the therapist. He later sought help from a psychoanalyst but after six months he could not see any improvement. Last year he heard about a new combined treatment program. He was placed on a new SSRI medication, and in a cognitive-behavioral training program emphasizing the modeling of competent social skills. He completed the program in seven weeks. He declares that he is no longer shy. There is no evidence of relapse or symptom substitution.

Treatments for mental disorders		
	Psychotherapeutic	Other treatments
Focus on body and emotions	Psychoanalysis Client-centered Gestalt	Psychosurgery ECT Pharmacology
Focus on thought and behavior	Cognitive	Behavioral modification

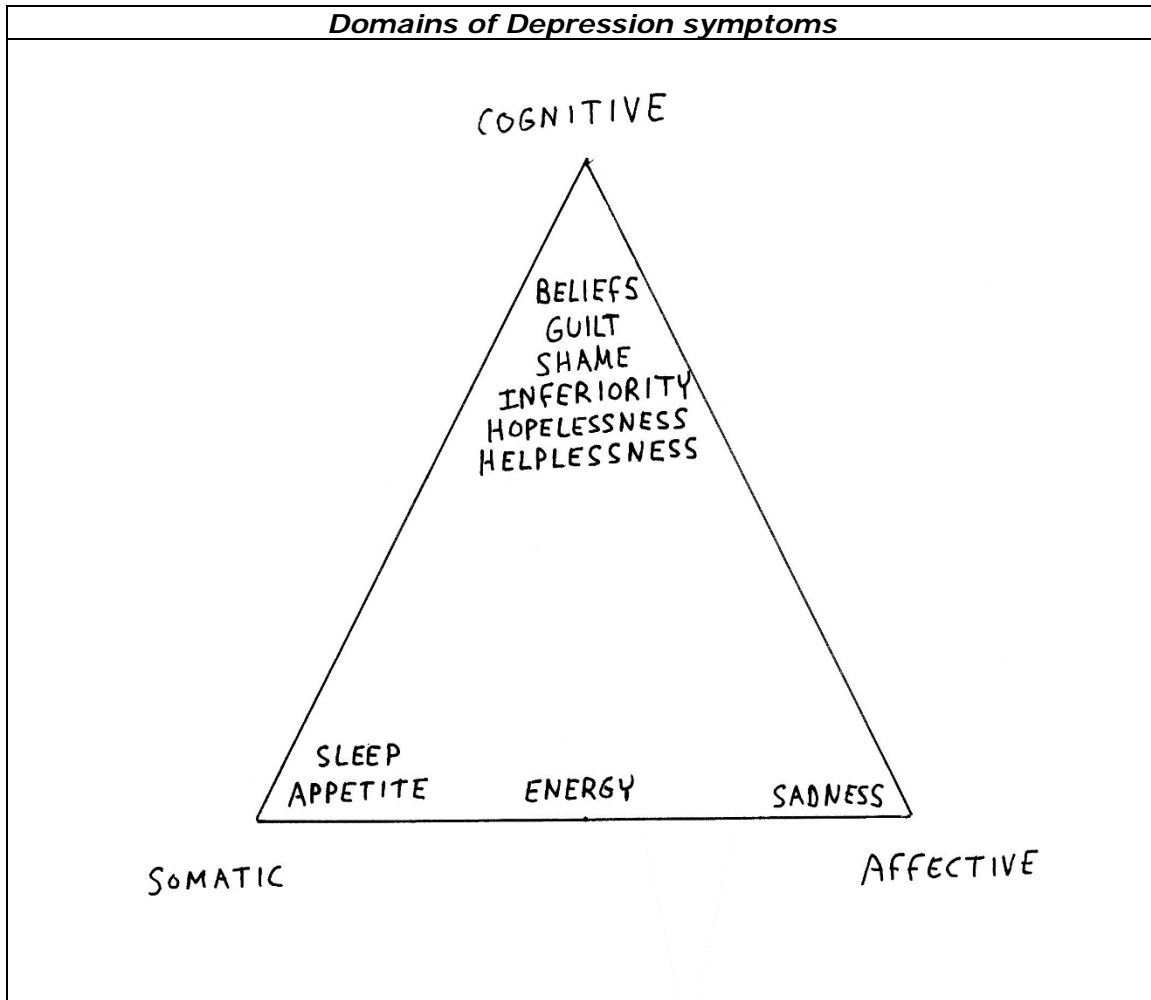
Comparing the effectiveness of the different major forms of treatment, both psychotherapy and behavior modification are good at resisting relapse because they change the patient's underlying personality traits or habits. However, because psychotherapy has the capacity to deconstruct certain old defense mechanisms, it is possible that the patient might end up worse off after the psychotherapy, but most patients do experience some degree of benefit. With medications (e.g., anti-depressants) patients usually divide bimodally into responders (they get better) and non-responders (the medication did not work).

The treatment decisions that clinicians make actually constitute an ongoing process of assessment, treatment, and reassessment. The clinician has four basic responses to a patient seeking help: treatment, reassurance that there is nothing wrong, referral to another professional, or consolation when the case is hopeless. When treatment is not effective, or has side effects, the treatment (or even the initial diagnosis) needs to be reconsidered.



QUESTION #11.5: What are mood disorders?

Mood disorders include depression, mania and bipolar. This classification used to be known as affective disorders because they are distinguished by emotional lows (major depression or the mild dysthymia) or highs (mania) or both (bipolar).



Depression is the most widespread mental disorder in the U.S. today, probably at every age level. Major depression and its less severe form, dysthymia, are characterized by sadness, delusions of hopelessness and helplessness, even some somatic symptoms (e.g., disturbances of appetite, insomnia). The diagnosis of depression is made easier by the use of any of several valid and reliable depression scales.

Scales for assessing level of depression			
ACRONYMN	DEPRESSION SCALE	RATING BY	MEASURES WITH
HRS	Hamilton Rating Scale	Observer	Emphasizes somatic symptoms
MMPI-D	Minnesota Multiphasic Personality Inventory Depression Scale	Patient	Emphasizes affective symptoms
SRS, SDS	Zung self-rating depression scale	Patient	Frequency of symptoms
CES-D	Center for Epidemiological Studies Depression Scale	Patient	Frequency of symptoms
BDI	Beck Depression Inventory	Patient	Intensity of symptoms
GDS	Geriatric Depression Scale	Patient	Yes/no format No somatic items

GERIATRIC DEPRESSION SCALE		
1	Are you basically satisfied with your life?	N
2	Have you dropped many of your activities and interests?	Y
3	Do you feel that your life is empty?	Y
4	Do you often get bored?	Y
5	Are you hopeful about the future?	N
6	Are you bothered by thoughts that you just cannot get out of your head?	Y
7	Are you in good spirits most of the time?	N
8	Are you afraid that something bad is going to happen to you?	Y
9	Do you feel happy most of the time?	N
10	Do you feel helpless?	Y
11	Do you often get restless and fidgety?	Y
12	Do you prefer to stay home, rather than go out and do new things?	Y
13	Do you frequently worry about the future?	Y
14	Do you feel that you have more problems with memory than most?	Y
15	Do you think it is wonderful to be alive now?	N
16	Do you often feel downhearted and blue?	Y
17	Do you feel pretty worthless the way you are now?	Y
18	Do you worry a lot about the past?	Y
19	Do you find life very exciting?	N
20	Is it hard for you to get started on new projects?	Y
21	Do you feel full of energy?	N
22	Do you feel that your situation is hopeless?	Y
23	Do you think that most people are better off than you are?	Y
24	Do you frequently get upset over little things?	Y
25	Do you frequently feel like crying?	Y
26	Do you have trouble concentrating?	Y
27	Do you enjoy getting up in the morning?	N
28	Do you prefer to avoid social gatherings?	Y
29	Is it easy for you to make decisions?	N
30	Is your mind as clear as it used to be?	N

DISORDER: depression

OLDER TERMS: melancholia

CLASSIFICATION: mood OLDER TERM: affective

PREVALENCE: 5 - 30 percent, women are more commonly diagnosed

SUBTYPES AND RELATED DISORDERS: dysthymia: chronic low grade depression; seasonal mood disorder (wintertime blues); postpartum depression in new mothers

CAUSES: predisposing heredity (endogenous depression) and early childhood losses; precipitating causes include reaction to loss (reactive depression)

a. PSYCHOANALYTIC THEORIES OF DEPRESSION:

1. loss of love object (mourning)
2. superego turns death instinct against the ego
3. dissipation of libido (neurasthenia)

b. COGNITIVE THEORY OF DEPRESSION:

perpetuating causes are cognitive schemas which are pessimistic, global, and stable

c. BEHAVIORAL THEORY OF DEPRESSION: lack of positive reinforcement for recreational and social activities; social reinforcement for morose behavior

SYMPTOMS: sadness, lack of energy, problems in concentration, constipation, insomnia, lack of appetite; delusions of hopelessness, helplessness, guilt; suicidal thoughts

TREATMENT: cognitive-behavior therapy, psychoanalysis, Gestalt therapy, client-centered therapy; anti-depressant medications, electro-convulsive therapy, lobotomy

Fortunately, depression is one of the most treatable mental disorders. It responds to over fifty different medications, and most forms of psychotherapy work on depression. Probably the best treatment for most people would be a combination of an SSRI (or SNRI) anti-depressant medication (e.g., Prozac) and cognitive psychotherapy.

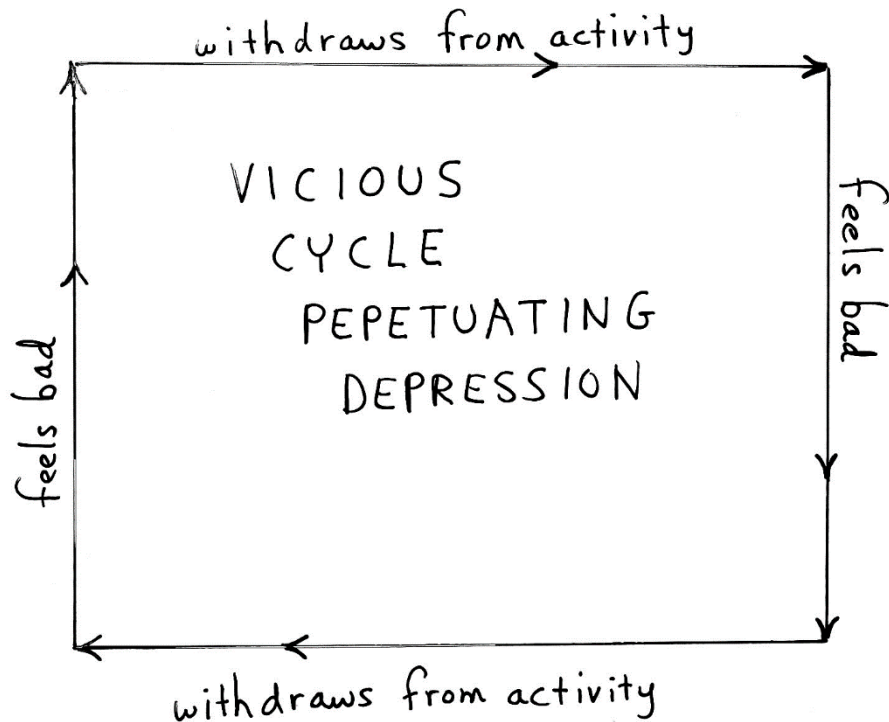
Perhaps because so many forms of treatment can work with depression, there are many theories that claim to explain its origins and dynamics. The bio-medical model would focus on metabolic abnormalities in levels of neurotransmitters such as serotonin. Further evidence for the importance of metabolic levels comes from Seasonal Affective Disorders (e.g., the winter reduced sunlight at the northern latitudes produces fluctuation in neurotransmitter levels).

There are several different psychoanalytic models for understanding depression. Freud in the 1890s described depression as the result of dissipation of libido. By 1915, he described it as a process of bereavement (mourning) over the loss of the object of one's love. Later, he explained it by saying that the superego turns the death energy against the ego.

The cognitive theory (e.g., Beck, Seligman) of depression focuses on perpetuating causes, such as beliefs (cognitive schemas) that are pessimistic ("bad stuff happens"), global ("this bad stuff is happening in every part of my life"), and stable ("this bad stuff is always going to be there in my life").

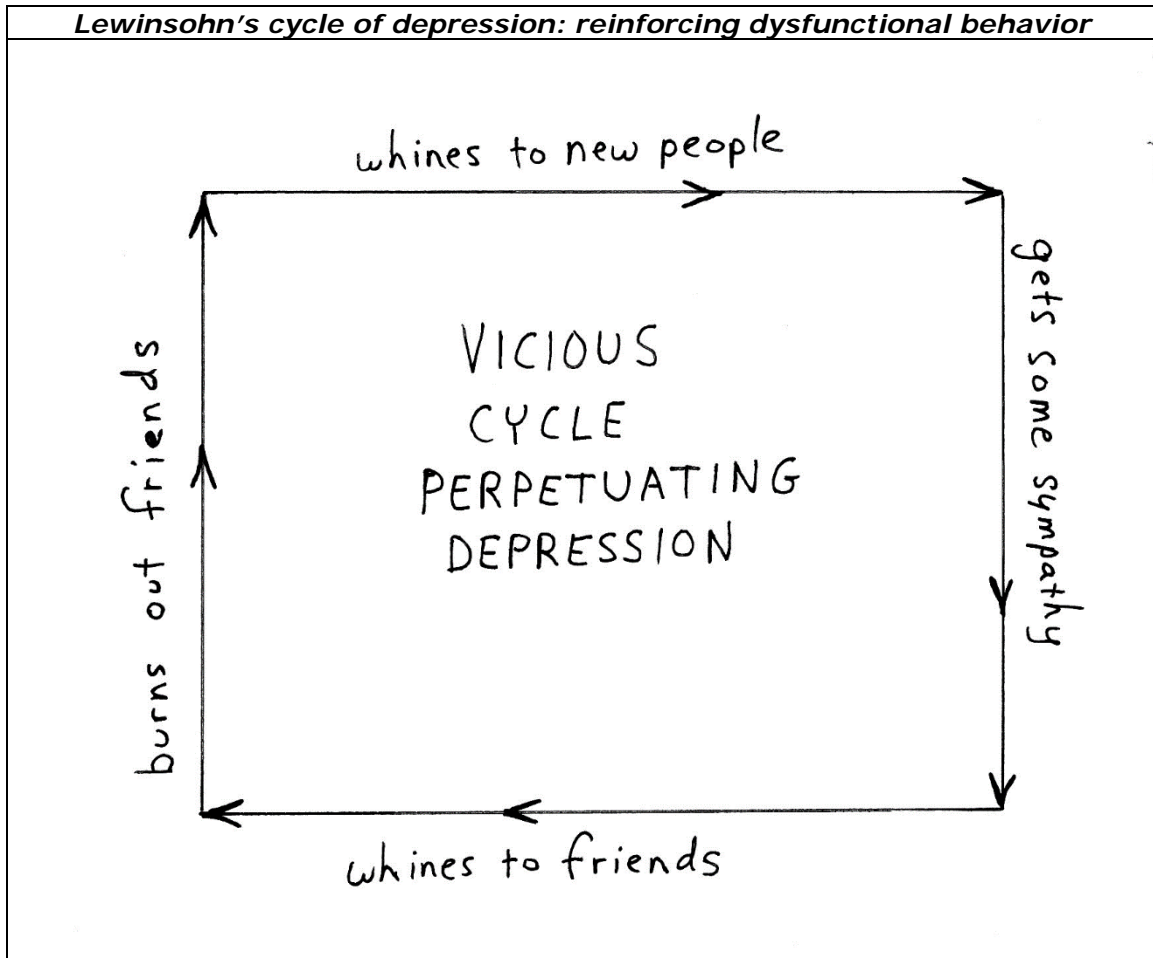
Behaviorists (e.g., Lewinsohn) have an interesting dual theory of depression. Depressed people tend to experience anhedonia, and no longer get pleasure from their regular recreational and social activities, so they give up these activities, and this makes them more depressed.

Lewinsohn's cycle of depression: withdrawal and non-reinforcement



Also, depressed people are likely to whine about their problems to friends, and that will bring some (temporary) positive reinforcement as the friends try to be encouraging and make efforts to cheer up the depressed person. But after a while, the friends get burned out, and stop calling or coming by. This intensifies the depression, and gives the patient something more to whine about with the next listener. This sets up another vicious cycle of perpetuation.

Most cases of suicide occur in depressives. One of the greatest challenges facing a clinical psychologist or psychiatrist is the prediction of suicide risk, knowing when to intervene with temporary hospitalization, and when to allow the patient to work out her own problems.



Mania is the opposite of depression. The patient has an **expansive (but unstable) mood**. The patient may feel great, so confident that he might engage in unwise or dangerous activity: gambling, driving fast, spending too much money, risky business deals, picking fights. Other manic symptoms include rapid, pressured speech, and a reduced need for sleep. Mania is usually episodic, lasting only for a period of days or weeks. There is less debate about the cause, an inherited biochemical disorder, which usually has its onset between the ages of 15 and 30. Medication is the core of treatment, and the greatest challenge is to keep the patient on his medication, even though he may claim not to need it, or he may want to re-experience the manic highs.

Most manic patients also experience longer depressive swings. However, most patients who experience depression do not also have manic episodes.

DISORDER: bipolar (cycling of mania and depression)

OLDER TERM: manic-depression

CLASSIFICATION: mood OLDER TERM: affective

PREVALENCE: 1 percent, maybe more common among writers and artists

SUBTYPES AND RELATED DISORDERS: cyclothymia (less severe)

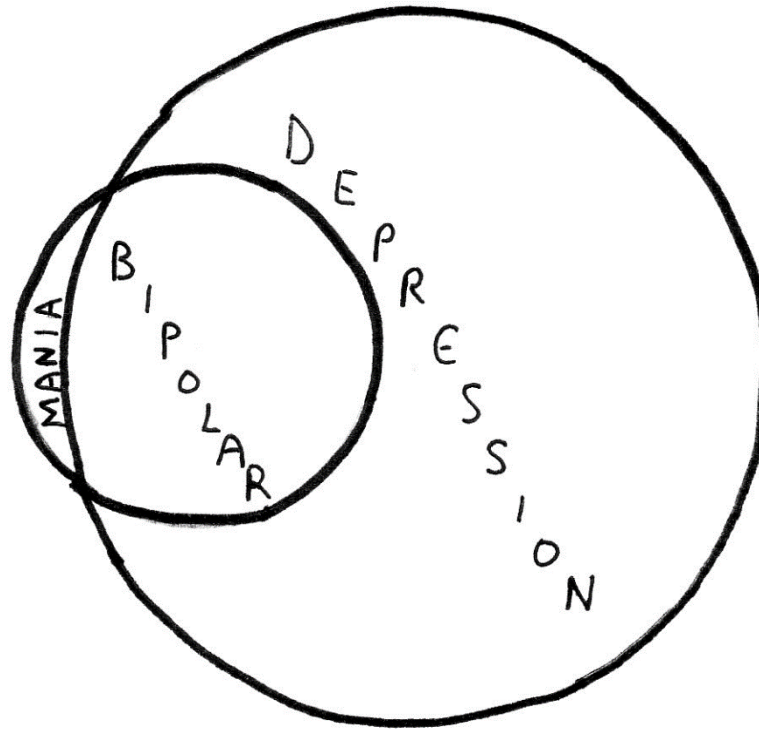
SYMPTOMS: in mania: expansive but unstable mood, rapid speech, lack of need for sleep; depressive cycles usually longer; suicidal risk when cycling out of depression

AGE OF ONSET: 15 - 30

CAUSE: inherited metabolic disturbance

TREATMENT: lithium, valproate acid

Mood disorder cases: manic highs and depressive lows



QUESTION #11.6: What is neurosis?

Neurosis is an old term (plural, neuroses; adjective neurotic) for **minor mental disorder**. Since the DSM-III in 1980, it is preferable to use the term *anxiety disorders* to describe this cluster: generalized anxiety, panic attacks, phobias, obsessive-compulsive, and post-traumatic stress disorder.

Generalized **anxiety** affects about one in ten Americans, and is slightly more common among women than men. The symptoms involve an overactive sympathetic nervous system: heart palpitations, sweating, queasy stomach. Cognitive symptoms might include difficulty of concentration. The closest emotion is fear or **general excitement**. Panic attacks are similar, but more episodic.

Medication may offer immediate symptomatic relief, but may carry some risk of addiction. Several forms of behavior modification (desensitization, flooding) as well as psychotherapy can bring long term relief.

DISORDER: Generalized Anxiety Disorder

CLASSIFICATION: anxiety disorder

OLDER: neurotic disorder

PREVALENCE: 5 to 15 percent, more common in women

SYMPTOMS: palpitations, difficulty concentrating, trembling

TREATMENT: anti-anxiety medication (e.g., Valium, Xanax, Buspar), psychoanalysis, cognitive-behavioral therapy

DISORDER: panic attack

CLASSIFICATION: anxiety disorder

OLDER: neurotic disorder

PREVALENCE: 3 to 5 percent of adults, more common among women

AGE OF ONSET: usually between the ages of 15 - 24

TREATMENT: both minor tranquilizers (e.g., Xanax) and SSRI anti-depressants (e.g., Prozac) are effective; so is behavioral modification: systematic desensitization, modeling

A **phobia** is an intense and irrational **fear**. It becomes disabling when it interferes with an important area of life, which may depend upon where the person lives.

<i>What is a disabling phobia depends upon where you live</i>	
LOCATION	DISABLING FEAR
New York	Elevators
San Francisco	Bridges
Mexico City	Subway
Los Angeles	Freeways
North Dakota	Open spaces

The object of the fear can be anything (e.g., heights, animals, dirt, loud noises, crowds, small enclosures, open unfamiliar spaces). One of the most disabled phobias is **agoraphobia**, also known as territorial apprehension.

Case Study: Mr. A, now 51, was a successful manufacturing entrepreneur by the time he was in his thirties. He had a beautiful home in the exclusive town of Atherton in northern California. One day when he was 45, he started to drive to his plant. He turned on El Camino Real, and the traffic was particularly stressful that day. He started to have chest pains, and feared that it might be a heart attack. He knew that he should head right for the hospital, but decided to turn off on a side street and go back home. As soon as he got in his long, tree-lined driveway, his chest cramps went away. Over the next few months, this scenario repeated several times. He decided to sell his business, but he could not enjoy his early retirement, because whenever he left his yard, he feared another panic attack. At this point he realized that he needed help. (Some agoraphobias get even worse, and cannot get out of the front door, or out of the bedroom, or even out of bed.) Mr. A was treated by *Terap*: a program that combined behavioral systematic desensitization and group psychotherapy. After his complete recovery, he went back to school and became a psychotherapist.

DISORDER: phobia: an intense, unrealistic, disabling fear

CLASSIFICATION: anxiety disorder **OLDER:** neurotic disorder

PREVALENCE: about one in ten adults; more common among women

SUBTYPES AND RELATED DISORDERS: acrophobia (heights), claustrophobia (enclosed spaces), zoophobia (animals), agoraphobia (open spaces)

CAUSES: principal cause is usually unfortunate prior exposure to the stimulus (e.g., classical conditioning)

TREATMENT: behavioral modification: systematic desensitization, flooding

Post traumatic stress disorder (PTSD) was first recognized on the field of military combat, but it has also been seen in victims of crime, natural disaster, and long term abusive relationships. The individual may have had a completely normal life prior to confronting a horrifying experience (e.g., military combat, rape, torture). The main symptom is painful flashbacks of the event that disrupt sleep, concentration, and normal emotional expression. Frequently, this may lead the patient to alcohol or other chemical dependency, which only serves to complicate the problem. Others find that they develop their own strong defense mechanisms and go on with their lives. Treatment usually requires some form of long term therapy, usually in a group context in which the survivors "debrief" their experiences over and over again.

DISORDER: Post Traumatic Stress Disorder (PTSD)

OLDER TERMS: Shell Shock, Transient Situational Disorder, Combat Fatigue

CLASSIFICATION: anxiety disorder

OLDER: neurotic disorder

SUBTYPES AND RELATED DISORDERS: within the first three months, known as adjustment disorder

SYMPTOMS: flashbacks, nightmares, disturbed concentration

CAUSES: principal cause is exposure to traumatic situation such as combat, torture, rape

TREATMENT: group psychotherapy

Case Study: Mr. Z, age 81, was a new nursing home patient who had been admitted for purely physical reasons. He had no previous history of psychiatric disorders, but became extremely fearful and potentially combative when the certified nursing assistant tried to get him for the first time into the shower. A small dose of haloperidol was tried, but with no real improvement. A social worker then interviewed Mr. Z and

discovered that he had survived a holocaust death camp, where he had learned to associate going to the shower with being gassed. Although this nursing home had a holocaust survivors' reminiscence group, Mr. Z said that he preferred not to participate. The social worker agreed that his defense mechanisms had served him well for over fifty years and should not be tampered with now. The solution to the presenting problem was to remove the terrifying stimulus: Mr. Z would be given baths instead of showers.

Obsessive compulsive disorder **OCD** is usually a defense against a phobia. The patient obsesses about the feared stimulus or situation and then compulsively enacts some dysfunctional behavior. OCD patients come in several varieties. **Arrangers** get nervous when things are out of order and compulsively want to keep things tidy. **Cleaners** fear dirt or germs, and compulsively try to clean and disinfect (e.g., washing one's hands hundreds of times a day). **Counters** fear losing or forgetting something important, and compulsively count irrelevant things over and over again (e.g., "Do I still have 43 cents in my pocket or have I lost some coins?"). **Checkers**, before they leave home or go to bed, may have to go around the house a dozen times to make sure that the gas is off and the doors are locked, and then drive around the block again just to make sure. **Clutterers** are so afraid of throwing away something of future value that they keep everything, to the point where their houses may become an unlivable pile of junk and trash.

Treatment for OCD can include variants of anti-depressant medication along with different forms of psychotherapy. If a specific underlying phobia can be identified, then the behavioral approaches of flooding and desensitization can also be considered.

DISORDER: Obsessive Compulsive Disorder (OCD)

CLASSIFICATION: anxiety disorders

OLDER: neurotic disorder

PREVALENCE: 2 percent

SYMPTOMS: intrusive thoughts and images, irresistible acts (e.g., cleaning, checking, counting, cluttering, arranging)

CAUSES: negative reinforcement: avoidance or escape conditioning

TREATMENT: cognitive-behavior therapy; SSRI anti-depressants (e.g., Prozac)

QUESTION #11.7: What is hysteria?

Hysteria is an old term used at the time when Freud was in training. **Hysteria refers to those mental disorders in which an unconscious mental block brings about the loss of a function.** Now we classify these disorders into somatoform and dissociative reactions.

Somatoform disorders deal with the body. These **conversion disorders** result in the upsetting or **loss of a physical function**. The function may be sensory (e.g., paresthesias, anesthesia, blindness, deafness) or motor (e.g., walking, talking, gagging, fainting, sneezing). These disorders were common during Freud's time, especially in women, but are now rather rare in the U.S. and other developed countries.

Case Study: Mr. D, age 19, comes from a small, rural village in Mexico where the public school system only went up to the sixth grade, and until five years ago, there was no electricity. Mr. D grew up in an environment in which regular contacts with the public health service were rare, and when someone was ill a local *curandero* or herbalist would be called in. He had a great aunt who at the age of 12 disappeared for a week, and then suddenly reappeared, claiming that she had been taken by the Devil. The entire village has heard that story, and no one has ever publicly doubted it. Mr. D knew that he would have to venture out of his village to find some opportunity in life so he joined the Mexican military. He was assigned to paratrooper training at the air base just west of Acapulco. He had not previously been close to an airplane, let alone up in one, and now he is being told that he will be jumping out of one. On the morning of the day that he was to make his first jump, he fell out of bed and claimed that his legs were paralyzed. He was not consciously faking it. The mental block was unconscious, but it prevented him from walking.

DISORDER: conversion

OLDER TERM: hysteria

CLASSIFICATION: somatoform; neurosis (old), functional (old)

PREVALENCE: widespread in 19th century, rare today in developed areas

SYMPTOMS: loss of a bodily function (e.g., sight, walking, talking, hearing, swallowing) for which no organic cause can be found

CAUSES: psychoanalytic theory: unconscious mental block; behavioral theory: secondary reinforcement of attention and escape

TREATMENT: psychoanalysis, sodium pentothal, hypnosis

Somatoform patients present to physicians in general practice or one of the non-psychiatric specialties. The diagnosis of conversion reaction is a process of elimination. Extensive laboratory and neurological tests are performed and only when a physical cause of the disorder can be ruled out should a psychiatric diagnosis be considered. Before the unconscious mental block of conversion can be inferred, one more possibility must be ruled out: the conscious faking of a physical disability known as factitious disorder (i.e., malingering, goldbricking). This is a much more likely explanation, especially when the loss of physical function is associated with a chance for financial gain (e.g., an insurance settlement) or getting out of military duty.

DISORDER: malingering, factitious disorder

OLDER TERMS: goldbricking

CLASSIFICATION: somatoform; neurosis (old)

PREVALENCE: widespread among military conscripts

SYMPTOMS: loss of a bodily function (e.g., sight, walking, talking, hearing, swallowing) for which no organic cause can be found; what differentiates this from conversion reaction is that the patient is consciously faking

CAUSES: behavioral theory: monetary gain or escape from duty

TREATMENT: non-reinforcement

Once the diagnosis of conversion has been inferred, the quickest treatment for somatoform disorder remains hypnosis. If the patient is not easily hypnotized, a drug such as sodium pentothal ("truth serum") might be useful. (This was all that was needed for Mr. D, the Mexican paratrooper.) Long term psychotherapy may be called for in some patients. The psychoanalytic approach is particularly well suited.

Do not confuse conversion reactions with hypochondriasis or psychosomatic disorders. Most **hypochondriacs** complain vigorously, but manifest no loss of physical function, while the conversion patient has lost a function, but may not seem all that upset. The treatment also differs. Hypochondriacs might benefit from a little supportive psychotherapy, but they are usually helped most by anti-depressant medication. **Psychosomatic** (psychophysilogic) disorders are where there is a real physical problem, exacerbated by stress.

DISORDER: hypochondriasis

CLASSIFICATION: somatoform; neurosis (old), functional (old)

SYMPTOMS: delusions of physical illness, diverse somatic complaints, compulsive seeking of medical attention

CAUSES: behavioral theory: secondary reinforcement of attention and escape; seems to be activated by comorbidity of depression

TREATMENT: anti-depressant medication; non-reinforcement

Comparison of disorders of the body			
Disorder	Psychosomatic	Conversion	Hypochondriasis
<i>Also known as</i>	Psychophysiological	Somatoform	Crock
<i>Examples</i>	Skin rash, Migraines, Hypertension	Paralysis Paresthesias Blindness	Doctor shopping
<i>Physical cause</i>	Maybe some	No	No
<i>Physical symptoms</i>	Yes	Yes	Not real
<i>Level of patient complaint or concern</i>	Varies	Low	High
<i>Environmental cause</i>	Stress	Fearful situation	Social obligation or manipulation
<i>Behavioral modification</i>	Biofeedback	Operant conditioning	Extinction
<i>Medication</i>	Symptomatic relief	Sodium pentothal	Anti-depressant
<i>Psychotherapy</i>	Supportive	In-depth	Supportive

Dissociative reactions involve an unconscious mental block that results in the patient losing some function of memory or identity. Depersonalization may be the most common and mild form. The patient is troubled by recurring thoughts that he himself, and/or the entire world, are not really real.

DISORDER: depersonalization

OLDER TERM: hysteria

CLASSIFICATION: dissociative, neurosis (old)

PREVALENCE: more common than other dissociative disorders

SYMPTOMS: subjective perception of unreality of external world and/or self

TREATMENT: psychoanalysis, client-centered therapy

Another relatively simple form is psychogenic **amnesia**. The patient presents a loss of memory too great to be explained by the normal processes of forgetting. This is also a diagnosis by exclusion. The most likely alternatives of dementia and physical trauma (e.g., blow to the head or electro-convulsive shock) must be ruled out. Malingering must also be considered.

DISORDER: psychogenic amnesia

OLDER TERMS: hysteria

CLASSIFICATION: dissociative, neurosis (old), functional (old)

PREVALENCE: rare

SYMPTOMS: loss of memory that cannot be explained by normal forgetting, dementia, or physical trauma

CAUSES: exposure to an emotionally traumatic situation

TREATMENT: psychoanalysis, sodium pentothal, hypnosis

Even more rare is a **fugue** disorder, a dissociative reaction in which the loss of memory is complete for the previous identity. The patient also travels several hundred miles from his residence or place of employment. She is then usually discovered in a dazed condition. Conscious fabrication (perhaps associated with criminal intent or psychopathy) is a good alternative explanation. Indeed, if there is any evidence of premeditation or planning (such as shifting money into different accounts or setting up a false identity) fugue is ruled out.

DISORDER: fugue

OLDER TERMS: hysteria

CLASSIFICATION: dissociative, neurosis (old), functional (old)

PREVALENCE: rare

SYMPTOMS: loss of memory and previous identity, departure from usual surroundings; cannot be attributed to conscious intent

CAUSES: exposure to an emotionally traumatic situation

TREATMENT: psychoanalysis, sodium pentothal, hypnosis

Case Study: Ms. H, 32, lives in rural Mexico, the common law wife of an agricultural laborer. She has been with Mr. H for twelve years and stuck with him only because of her two children. Mr. H has problems with drinking and battering, but most of the time he was away, north of the border working and sending a little money home. A few months ago, the two children and the parents of Ms. H died in a bus accident. When Mr. H returned home from the U.S., he was especially brutal, blaming her for the loss of their children. She disappeared with just the clothes on her back, and was found two weeks later at a bus stop in the next state, claiming that she did not know who she was.

The rarest and most severe of all dissociative reactions would be **dissociative identity disorder** (i.e., "multiple personality"). The individual's regular (host) personality tends to be rather meek and passive. At least one other personality is developed. These alter personalities pop out without warning and take over the individual's behavior: posture, gestures, facial expressions, voice tone and word choice changes dramatically under the influence of the other personality. The alter personalities are aware of the host personality, but regard it with contempt for being too weak. The alter personalities tend to be more confident, bold, and daring. The host personality is not consciously aware of the existence of these other personalities, and the time when they pop out is later perceived as a blackout period. In most cases, the patient's childhood was a traumatic one and the dissociative identity can be seen as some sort of defense mechanism, "This is not happening to me, but to her, because she is so weak." Treatment for most dissociative reactions is similar: hypnosis or sodium pentothal interviews combined with long term psychotherapy (with an emphasis on the latter in the more severe cases).

DISORDER: dissociative identity disorder

OLDER TERMS: hysteria, multiple personality

CLASSIFICATION: dissociative, neurosis (old), functional (old)

PREVALENCE: rare, but seen more often than it was fifty years ago

SYMPTOMS: host personality is weak, passive; alter personalities pop out and dominate the individual's behavior, and these periods of dominance are perceived as blackouts

CAUSES: enduring reaction to childhood abuse

TREATMENT: psychoanalysis, sodium pentothal, hypnosis

QUESTION #11.8: What is psychosis?

Psychosis (plural, **psychoses**; adjective, **psychotic**) refers to serious **mental disorders** (as opposed to the more mild neurosis) and involves a severe inability to function within normal society. It used to be said in jest that the neurotic may build imaginary castles in the air, but it is the psychotic who actually tries to live in them.

Schizophrenia is a psychotic disorder. It is not a "split" or multiple personality (that is the rarer, dissociative reaction described above). Schizophrenia is defined by its symptomatic cluster. Schizophrenics have severe **delusions (false beliefs)** sometimes relating to identity. I have met the "President of Argentina," holding an imaginary cabinet session, in *Hospital Borda* in Buenos Aires; and the Devil and the Son of the Devil (same patient) outside of Santo Domingo. Another frequent symptom is **hallucinations (sense experience in the absence of stimuli)** especially voices which the patient perceives as threatening and insulting.

In one famous study of the early 1970s, David **Rosenhan** recruited eight healthy volunteers and had them show up at different mental hospitals complaining about hearing voices. All of these volunteers were admitted with a diagnosis of schizophrenia. Under subsequent editions of the DSM, more criteria have been required for diagnosis of schizophrenia.

Another frequent symptom is bizarre use of language. The patient may think that he is waxing profound and poetic, but it sounds like word salad with strange grammar and invented words. Most schizophrenics have difficulty expressing an emotion appropriate to the occasion. They may appear to be more happy, sad, angry, or frightened than the situation would call for. Another possibility is "flat affect" in which the patient seems entirely aloof to what is going on around him. Deficits in social skills may be observed in many patients.

DISORDER: schizophrenia

OLDER TERM: dementia praecox

CLASSIFICATION: psychosis

PREVALENCE: 1 percent

SUBTYPES AND RELATED DISORDERS:

- SCHIZOPHRENIFORM: all the required symptoms, but a duration of less than six months
- PARANOID: bizarre and incredible delusions of persecution, plots and thought control
- CATATONIC: extreme withdrawal to the point of acting like a statue
- PROCESS: chronic, gradual onset, no stressful precipitant, poor prognosis
- REACTIVE: acute, rapid onset after stressful event, better prognosis
- REFRACTORY: term given to schizophrenia case which is not responsive to treatment
- RESIDUAL: delusions, bizarre language, and hallucinations are absent, but the patient remains socially withdrawn

SYMPTOMS: "positive" symptoms include hallucinations, delusions, agitation, bizarre use of language; "negative" symptoms include deficits in social skills, affective response

AGE OF ONSET: 15 to 25

CAUSES: there is a genetic (and/or intrauterine congenital) predisposition; the principal cause would be abnormalities of brain structure or chemistry (e.g., surplus of dopamine)

TREATMENT: anti-psychotic medications (old: Thorazine, Mellaril, Haldol; newer: Risperdal, Clozaril). Older medications carry high risk of tardive dyskinesia

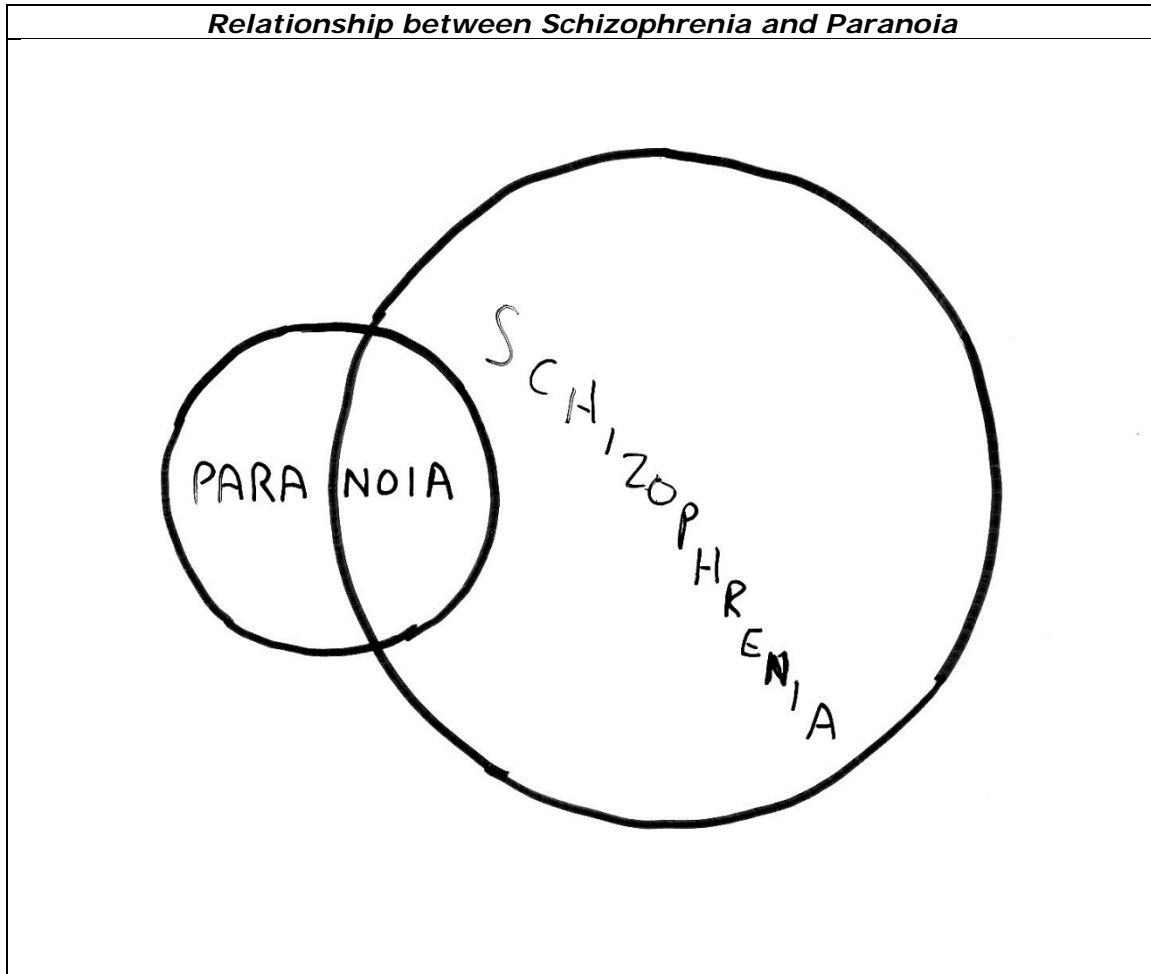
Case Study: Mr. L, was born in Cuba before the Castro Revolution. His family moved to Mexico in the early 1960s, and he was sent to a boarding school in the U.S. He finished his bachelor's degree at an Ivy League college and earned an M.B.A. from another prestigious university. He told his family he was having "adjustment" difficulties during his first year of graduate work, but his family began to fear that he was coming down with the strain of mental disorder found in an uncle and a couple of cousins. He returned to Mexico, and spent a short time working for the family business in Mexico City. With his next breakdown, they decided to send him to a luxurious mental hospital just outside of Guadalajara, where he remains today. When he is on his medication, he dresses impeccably, reads the *New York Times* each day, and has fooled more than one visitor into thinking that he is the director of the asylum instead of one of the patients. If he misses his medication, he cannot comprehend what he reads, sees, or hears, and quietly retreats to a private world. If the family were more motivated, he could probably be living at home, and perhaps helping out with the family business.

Catatonia and paranoia are types of schizophrenia. **Catatonics withdraw into a statue-like stupor** for periods of several hours. **Paranoids have delusions of persecution and extreme suspiciousness.** Some depressed patients and many early stage dementia patients also develop paranoid delusions, but when schizophrenics become paranoid, their delusions are bizarre. The conspiracies might be incredible, involving the Mafia, CIA, and space aliens conspiring to read the patient's thoughts.

Schizophrenia has at least a biological predisposing cause (and probably that is also the principal cause). Some older theories suggested that there might be some role of a dysfunctional family of origin, perhaps a mother who is cold or too controlling. These factors might serve more as a perpetuating cause: the parents and other family members are reacting to the patient's deteriorated behavior, and unfortunately their reactions might make it worse.

The genetic link in schizophrenia (and mania) is probable: the closer the genetic relatedness between two individuals, the more likely that if one is diagnosed with schizophrenia, so will the other one. The incidence of schizophrenia in the general population is about one percent, in children or siblings of schizophrenics it is about ten percent, but if one identical twin is diagnosed with the disorder, odds are about even that the other will also get that diagnosis. While most children of schizophrenics do not develop schizophrenia themselves,

they might be carriers of a gene that makes for susceptibility to the disorder. It is very rare that someone will be diagnosed as schizophrenic unless someone else in the family tree has already received that diagnosis.



Treatment for schizophrenia must center on medication to control the symptoms. Schizophrenics generally do not follow very well the structured approach of cognitive therapy. Freud himself argued against using psychoanalysis with schizophrenics: they are already lost in their own free association. More client-centered, and Jungian therapists have reported some favorable results, especially with teenage, reactive patients. About a third of schizophrenics require lifetime hospitalization. Behavioral approaches (such as token economies) and psychosurgery are usually limited to making the patient more manageable within an institutional context.

<i>Comparison of major mental disorders</i>					
Disorder	Depression	Anxiety	Bipolar	Schizophrenia	Multiple personality
<i>Classification</i>	Mood	Anxiety	Mood	Psychosis	Dissociative
<i>Incidence</i>	Common	Common	Low	Low	Very rare
<i>Gender predominance</i>	Female	Female	Equal	Equal	Female
<i>Age of onset</i>	Anytime	Anytime	15-30	15-25	15-30
<i>Link to heredity</i>	Moderate	Moderate	Great	Great	Little
<i>Link to childhood trauma</i>	Moderate	Moderate	None	Little	Great

QUESTION #11.9: What is a psychopath?

Psychopath (also known as sociopath) is an older term for what the DSM now calls **anti-social personality**. This is one of several Axis II diagnoses known as personality disorders. The antisocial personality is best understood as **a person without a conscience**, someone who can easily exploit or harm someone else without guilt or remorse. Most criminals probably do not fall into this category: for many have a real sense of shame and remorse for what they have done. Not all psychopaths end up incarcerated. Many may stay on the fringes of legitimate business (or go into politics) and are clever enough to avoid getting caught. Psychopaths are skilled liars and charmers.

There are two basic types of anti-social personality: violent and non-violent. The violent ones are the rare serial killers who target strangers just for the thrill of the power. The non-violent are more common. They tend toward imposture and swindling.

Case Study: Mr. U, age 56, was finally brought to trial in Arizona for bigamy. It was discovered that he had married (and neglected to divorce) over a hundred women. His pattern was to court wealthy women who had been recently widowed. Although he was short, balding, and chubby, he was very charming. Soon after the marriage, he would figure out a way to abscond with the woman's fortune, and then go to another town and do the whole thing over again with some other victim.

DISORDER: antisocial personality disorder

DSM-IV: Axis II

OLDER TERMS: psychopath, sociopath

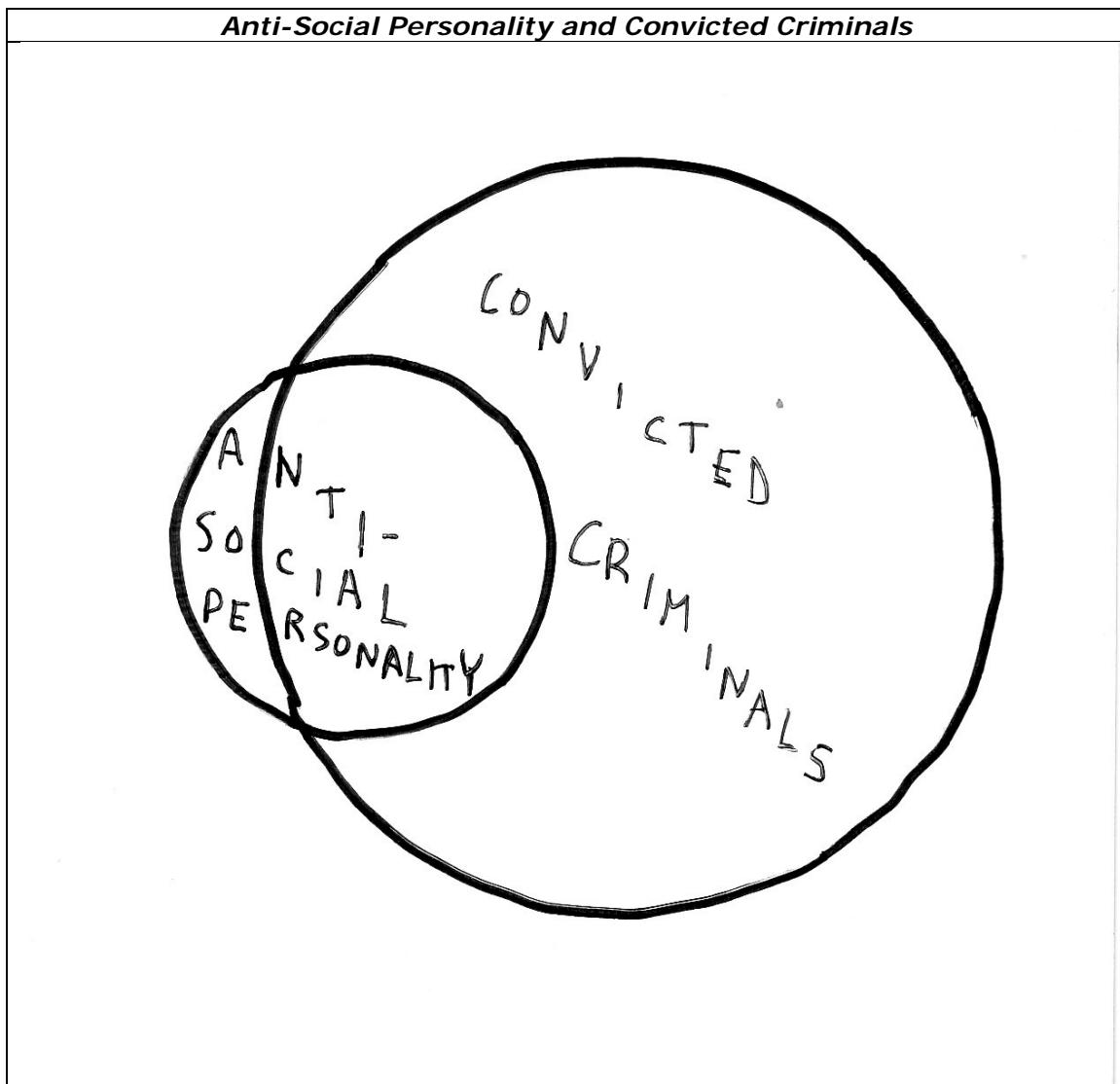
PREVALENCE: two to three percent, more common among men

CLASSIFICATION: personality disorders, character disorder (older)

SYMPTOMS: exploits others without guilt, shame or remorse; manipulative, deceitful, some are violent; history of conduct problems as a child

AGE OF ONSET: childhood or adolescence

TREATMENT: none effective



Somewhat less dangerous are the histrionic and narcissistic types. They both crave to be the center of attention and demand to be treated with special status by those around them. Histrionics tend to be a little more obnoxious about it, with self-dramatizing behavior comparable to that of soap-opera characters.

DISORDER: histrionic personality disorder

DSM-IV: Axis II

OLDER TERMS: hysterical personality disorder

PREVALENCE: two or three percent, more common among women

CLASSIFICATION: personality disorders, character disorder (older)

SYMPTOMS: chronic and excessive attention seeking; self-dramatization, irritability

AGE OF ONSET: childhood or adolescence

TREATMENT: none

DISORDER: narcissistic personality disorder

DSM-IV: Axis II

PREVALENCE: two to three percent

CLASSIFICATION: personality disorders, character disorder (older)

SYMPTOMS: preoccupation with admiration of others, self-promoting, lack of empathy

AGE OF ONSET: childhood or adolescence

TREATMENT: none

The **borderline** personality initially appears to be a case of depression or bipolar. The patient turns out to be non-compliant with medication, manipulative in psychotherapy, and frequently self-mutilating. In the past, the label of borderline personality was assigned when the therapist realized that further treatment with an uncooperative patient was fruitless. In the past two decades, much progress has been made with the use of dialectical-cognitive-behavioral therapy with borderline adolescents.

DISORDER: borderline personality disorder

DSM-IV: Axis II

CLASSIFICATION: personality disorders, character disorder (older)

PREVALENCE: two to three percent; more common among women

SYMPTOMS: impulsive, emotional instability, angry outbursts, fear of being alone, manipulative, boredom, self-mutilation, suicidal risk

AGE OF ONSET: childhood or adolescence

TREATMENT: dialectical-cognitive-behavioral

UNIT 12: DEVELOPMENTAL

QUESTION #12.1: What is human development?

Developmental psychology is the branch concerned with the changes in behavior over the 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 (as well as "mature" and "maturity") 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**, a century and a half 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 intra-species 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 activation, and does not need the stimulation provided by contact with 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.

Possible relationship between two siblings			
		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 overwhelming 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 Variables</i>	Vocational choices, preferred hobbies, breed of dog chosen, name of spouse
<i>Results</i>	Amazing similarities reported
<i>Conclusion</i>	Heredity is more important than environment.

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 the role of 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 (usually, 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 other behaviors right after emerging from an egg. 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.

Research on imprinting	
<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 become imprinted. After that point, no other bird will be considered an acceptable mate. Even if the original mate dies, the surviving 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. Harry and Margaret **Harlow** 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 while young. 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 South 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 role of environment on intelligence	
<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.

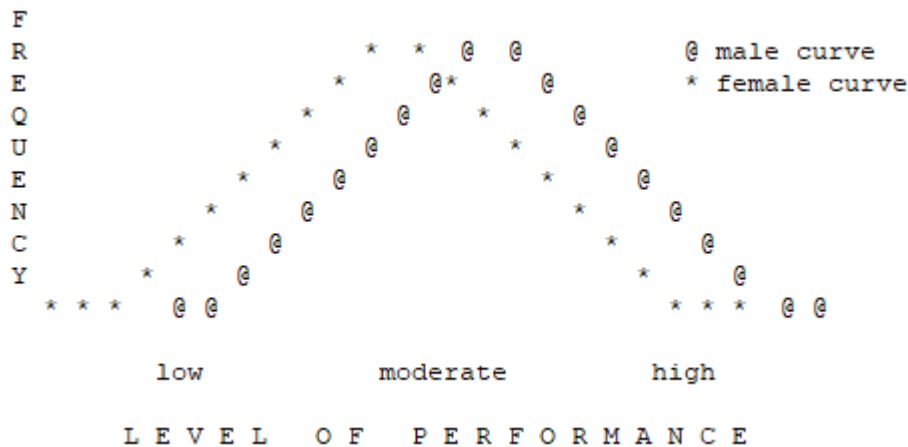
Babies also need comforting and nurturing. A famous study indicating this was performed by Harry and Margaret **Harlow**, who took a baby **monkey**, and raised it in a cage separated from its natural mother. The Harlows then put two **surrogate mothers** into the cage. One was made out of wire, and 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 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. According to Diana **Baumrind**, 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, 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.

Comparison of Baumrind's parenting styles			
Parenting style	Level of emotional support	Emphasis is on	Effectiveness
<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

[Emir](#) was three in this video. Some students regard this as authoritarian parenting, but I regard this as authoritative since Emir can see the consequences of his behavior and choose his response. When he was seven he returned to Acapulco with younger cousins and repeated to them what he had been told that "good children get to go to the beach and bad children have to stay home."



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 that 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 of this new reflex 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).

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.

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

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. **Asperger** syndrome is a term given to high functioning autistics.

DISORDER: autism

PREVALENCE: rare

SYMPTOMS: extreme social withdrawal, self-stimulation, wants order

AGE OF ONSET: earliest childhood

CAUSES: genetics or prenatal development

TREATMENT: behavior modification to control more extreme behaviors

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 of 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 controls emotions).

QUESTION #12.3: What is gerontology?

After adolescence, the age demarcations are less clear cut. 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 poor, developing nations 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 of Europe, North America and East Asia, the proportion of aged is increasing, and will soon surpass a quarter of the population in some countries.

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. 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 high 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 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 from his father-in-law, 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 see 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.

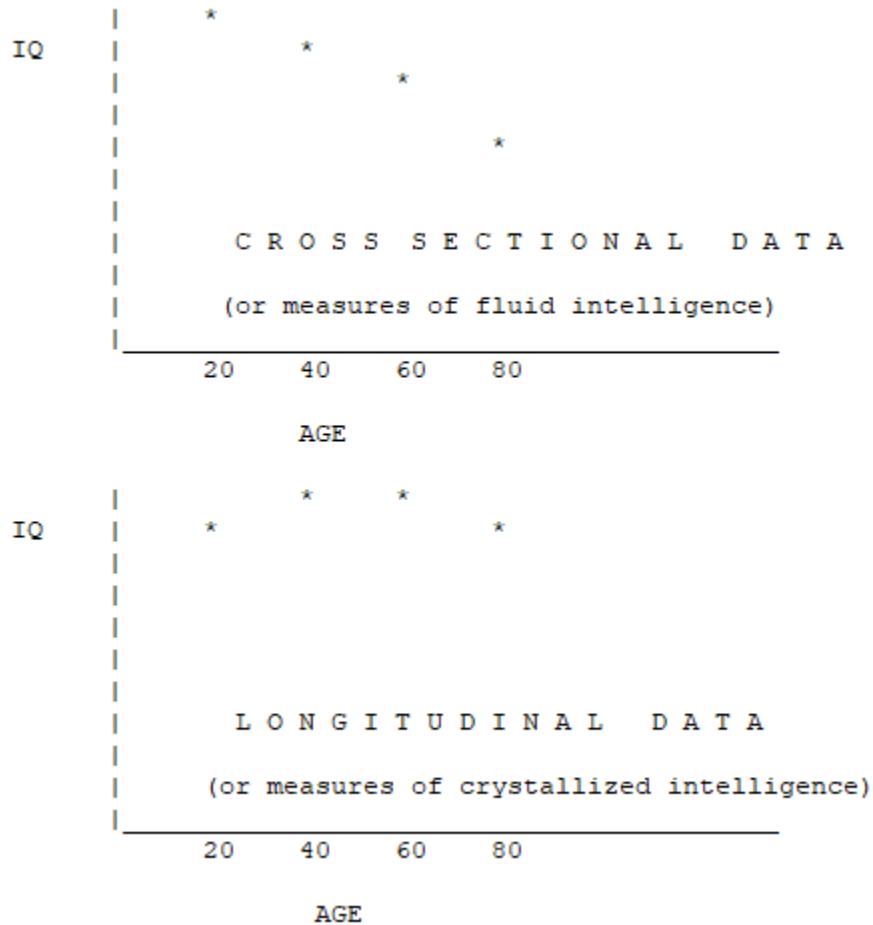
An alternative design for research is the **longitudinal**. These studies take the same sample and repeatedly measure it over different time periods. In dealing with children at an elementary school you could start this year with the first graders, and come back in just four years to look at the same 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 2018 to 2078: repeated measures

2018 first measure	2048 second measure	2078 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).

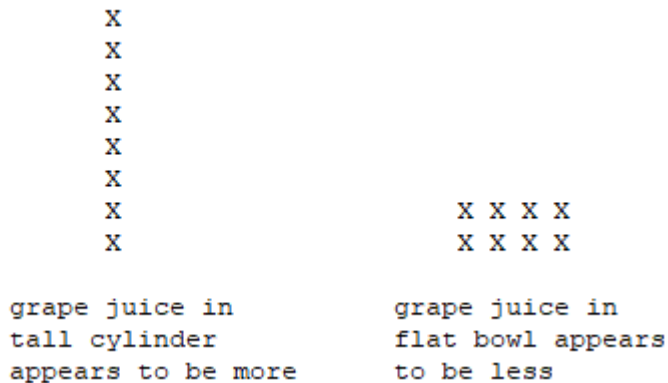


The Kubler-Ross model has been applied to the trajectory of bereavement (grief, mourning) in the survivors, especially when the death was unexpected.

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

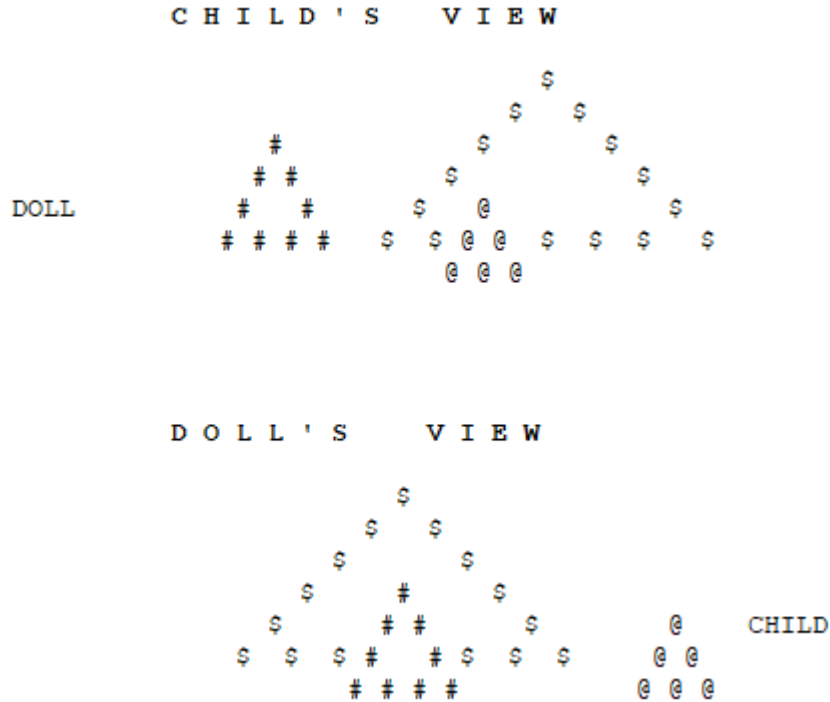
Jean **Piaget** constructed a stage theory of child development that is **cognitive**, emphasizing how children's mental abilities progress qualitatively in a fixed, invariance sequence of stages. Piaget is not so much concerned with emotion, or interpersonal processes, but with the child's cognitive 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.



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 right. A medium sized mountain is in the back, to the left. 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.



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.

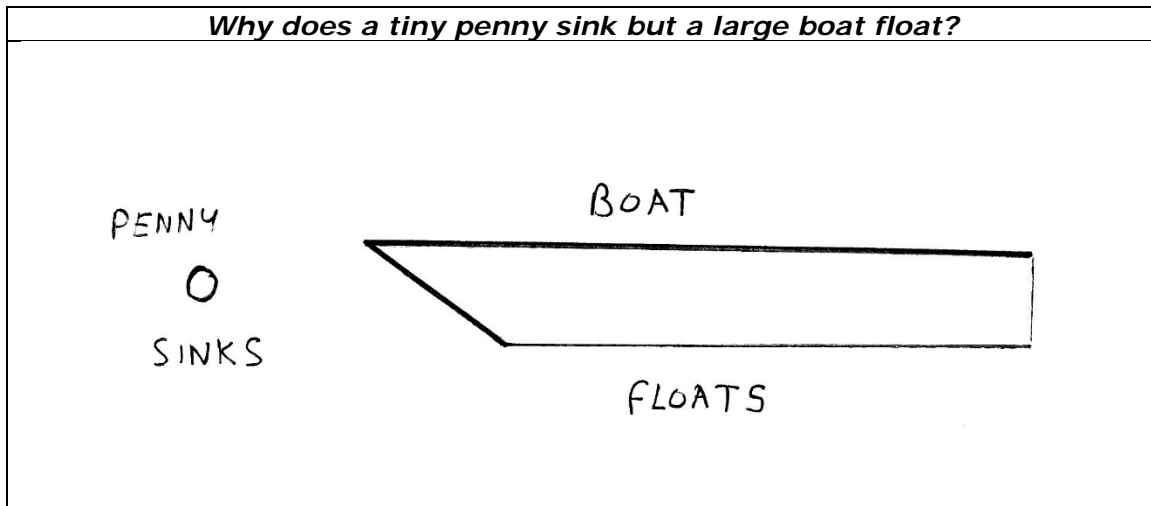
"Why doesn't a penny float?" The child says it is too heavy.

"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.

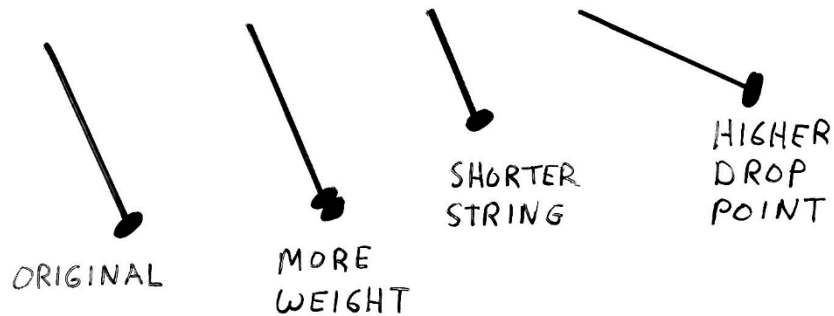
When children are firmly in the formal operational stage, their answers will be able to include something about the weight of the boat, in proportion to its size, being less than that of the water.



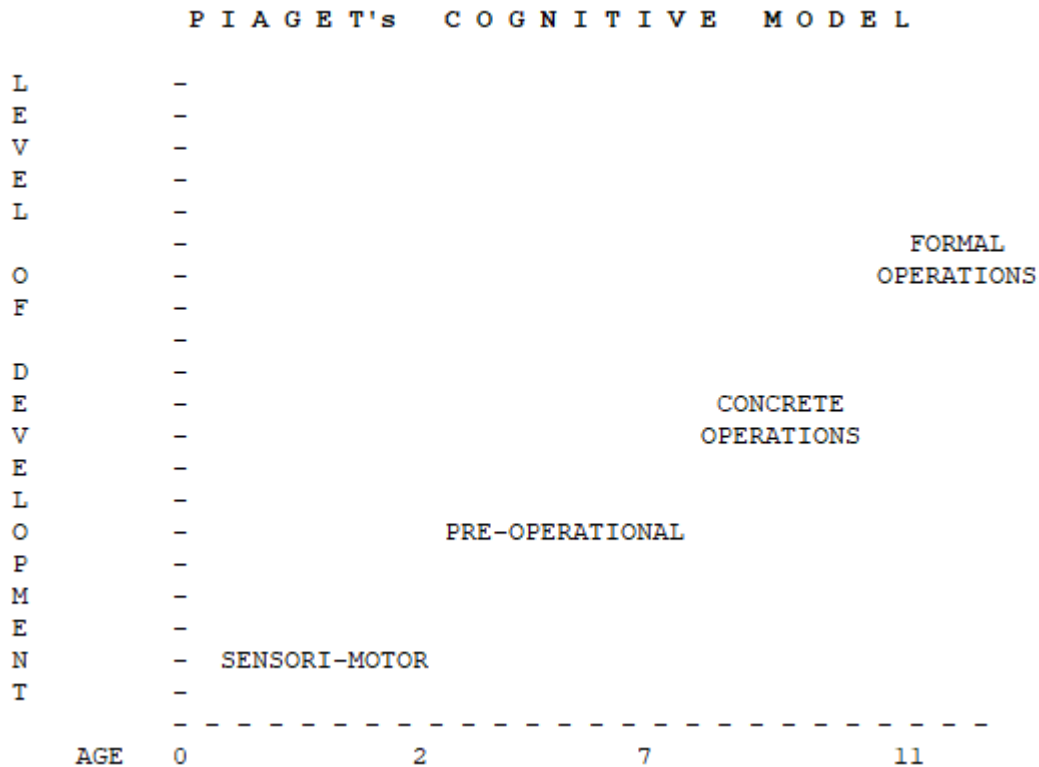
Another example is the pendulum problem. After being shown a pendulum, the child is asked, how can we get this pendulum to go back and forth in less time? He is shown three possible alternations of an independent variable: higher drop point, greater weight, or shorter string?

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.

How could we shorten the time of the pendulum's swing?

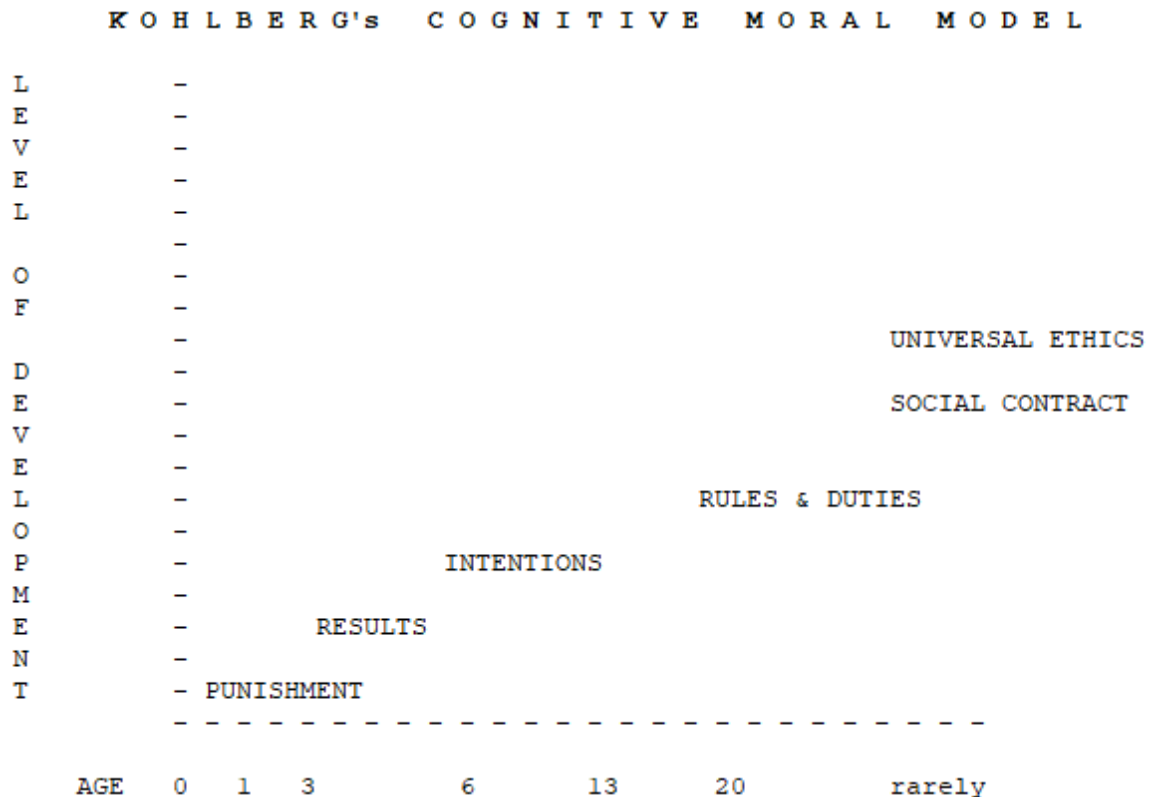


Many psychologists have questioned the specifics of Piaget's stages, suggesting that children may be just confused by the phrasing of the questions, and maybe there are wider individual variations that he thought possible. However, the central concept to be gleaned from Piaget is that children can only 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. These three videos demonstrate the superiority of Vygotsky over Piaget. The [first](#) video shows that six-year-old Emir cannot pass Piaget's test of seriating seven objects of different length. The [second](#) video shows that he can put seven cardinal numbers in order. The [third](#) video shows that with cardinal scaffolding, he can correctly seriate the objects.

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.



KOHLBERG'S STAGES OF ETHICAL DEVELOPMENT

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).

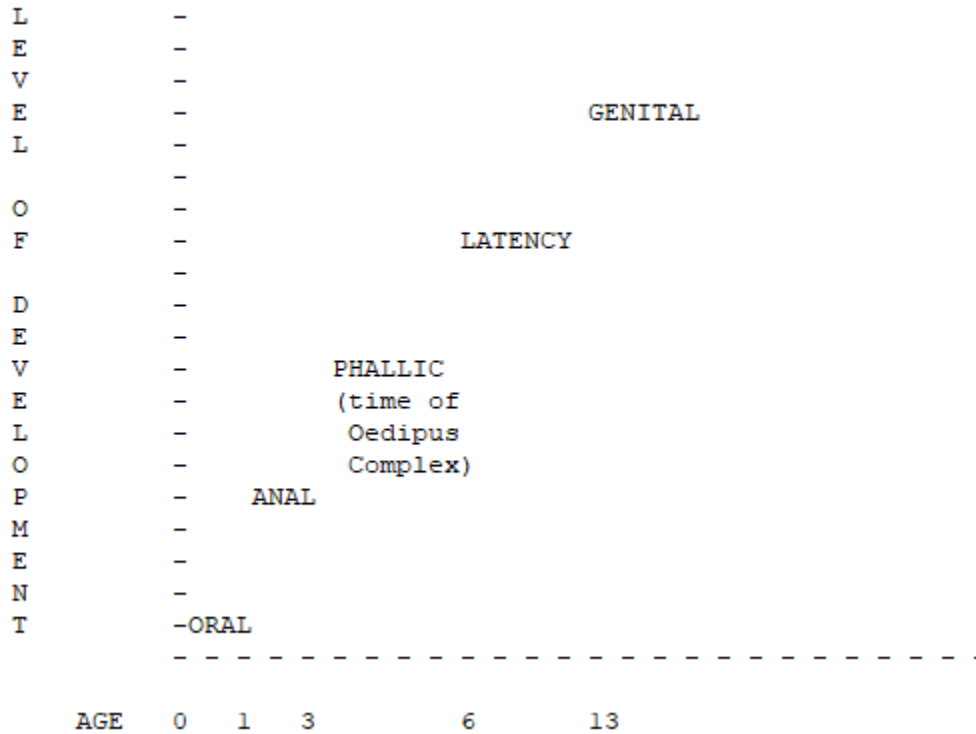
Kohlberg's model may ignore some additional factors in moral decision-making. For example, boys are more likely to think in terms of concepts of justice, while girls are more likely to consider the feelings of everyone involved. Another factor may be the social context in which the individual functions.

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 pre-conventional 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.

FREUD'S PSYCHOANALYTIC MODEL

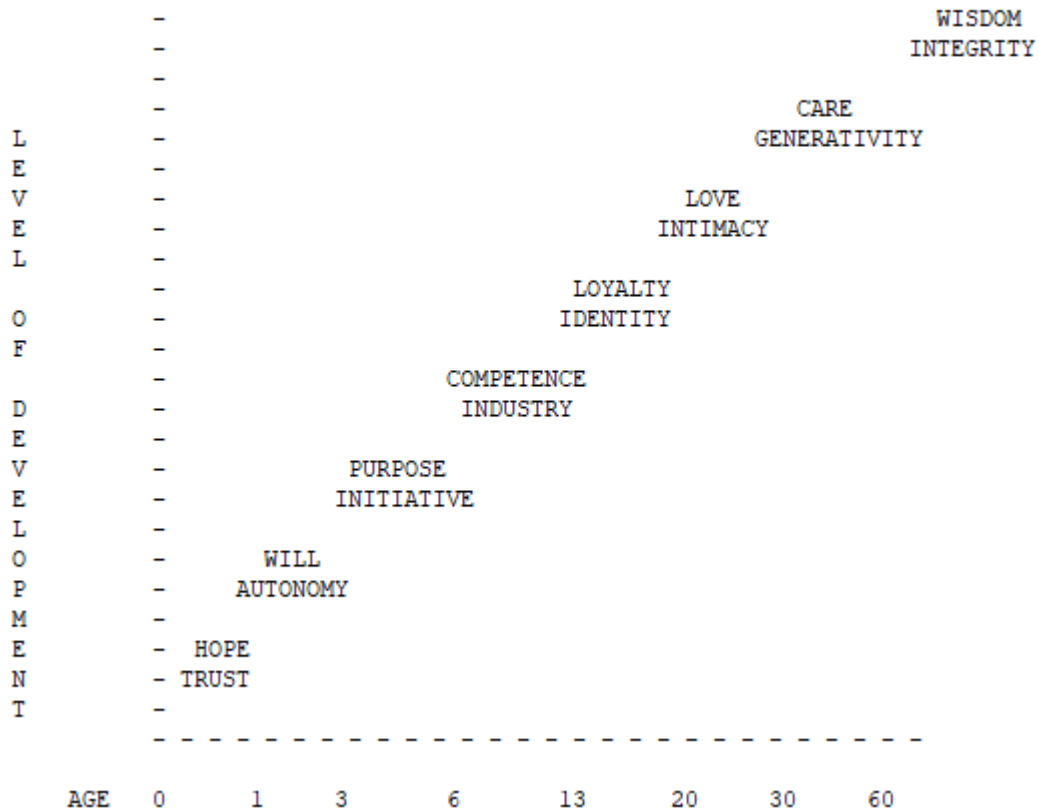


<i>Freudian psycho-sexual developmental stages</i>		
Stage	Age	Characteristics of those fixated
Oral	0-1	Dependent, whiny, gullible
Anal	1-3	Emotionally constricted, frugal, orderly, punctual
Phallic	3-6	Flirtatious, conceited
Latency	6-13	
Genital	13+	

Case Study: Mr. C, born in 1946 after the death of his father in a car accident, grew up to see his mother have a series of boyfriends and husbands. Mr. C never identified with any of them, but considered them all as rivals for his mother's affection. Tall and charming, he had many lovers. Although he married at age 30, he continued his philandering with all kinds of women, good looking and plain. The lack of an appropriate father figure meant that Mr. C would be vulnerable to fixation at the phallic stage.

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.

ERIKSON'S PSYCHOANALYTIC MODEL



In stage one, oral (0-1) the child is in an incorporative mode, taking in the mother's nourishment and love. The central conflict is one of trust vs. mistrust, and the central virtue to be attained is hope. If adult(s) are present and tend to the child's needs for nurturing in this first stage, the child will learn to trust the world to meet his needs. If he does not develop trust at this time it will be difficult for him to successfully negotiate the later stages.

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 chose 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 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.

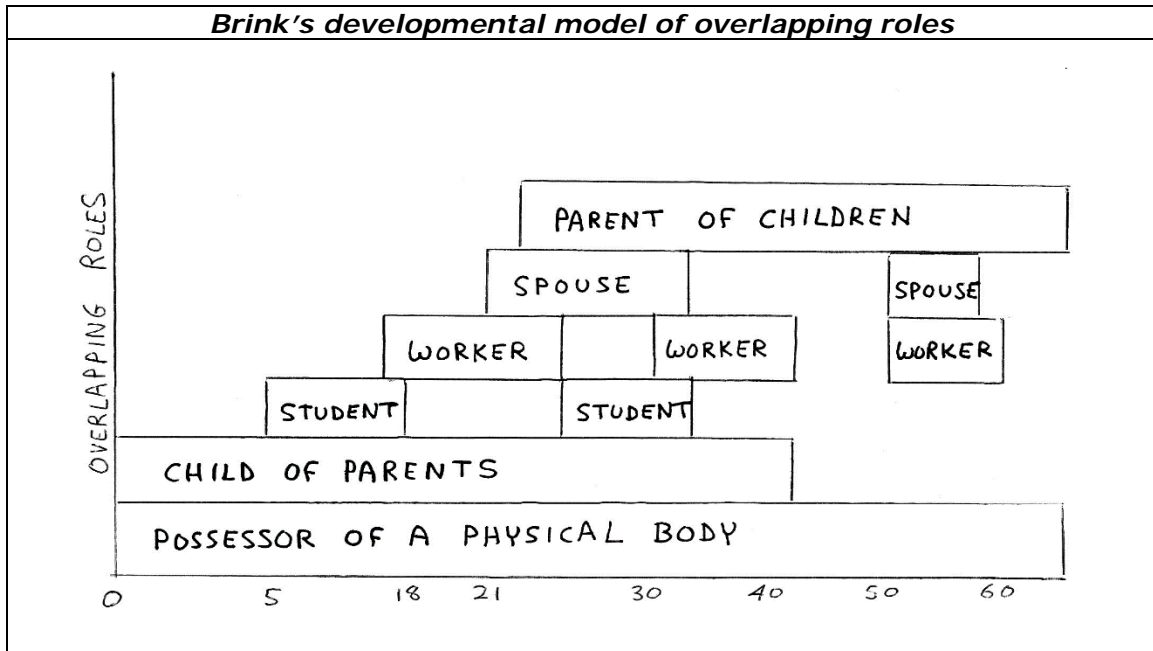
Erikson's model was further extended by Levinson who added several adult sub stages. Levinson did a longitudinal study of a graduating class of men from Yale. He found that most of them went through about a dozen identifiable stages (which may be attributable to the homogeneity of his sample).

Carol **Gilligan** has pointed out that Erikson's model is excessively male. Female development tends to come less in terms of 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 results.

One way to appreciate these differences is to get out of the modality of stairs, and start using [Brink's](#) metaphor 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.



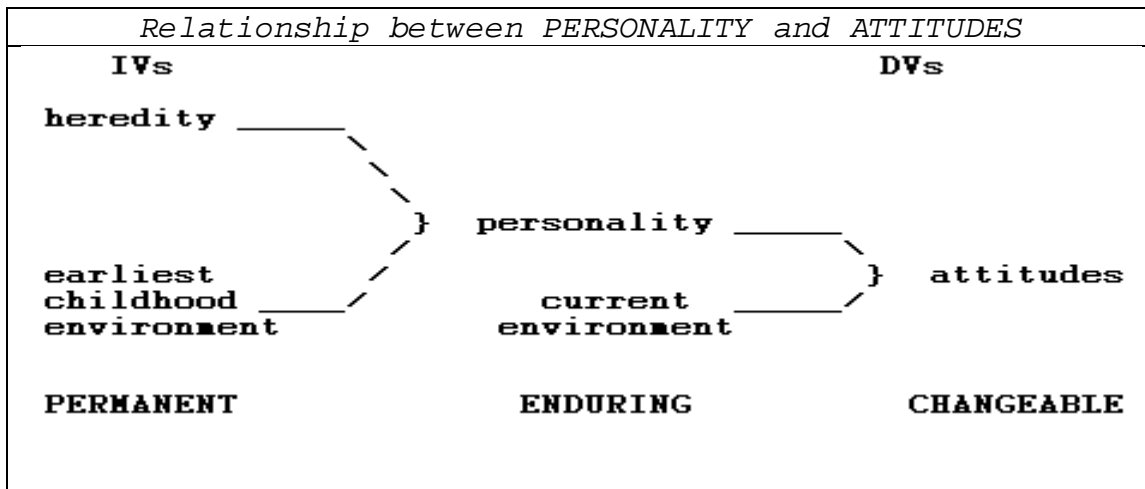
Theories of Psychological Development			
Theorist	Approach	Subjects	Main theme
<i>Lorenz</i>	Ethology	ducks, geese	Imprinting in critical periods
<i>Harlow</i>	Lab experiments	monkeys	Infants need nurturing and mental stimulation
<i>Freud</i>	Psychoanalytic clinical & historical case studies	adult patients, 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

This video summarizes many of these [models](#).

UNIT 13: SOCIAL

QUESTION #13.1: What are attitudes?

Social psychology is the branch studying individuals in a macro interpersonal environment, how they respond to interpersonal and institutional stimuli. One topic within social psychology would be **attitudes, which are defined as learned habits for responding to social stimuli**. Attitudes must not be confused with personality traits. Attitudes are not as permanent or as consistent as personality traits. Traits are supposed to be characteristic of the individual, regardless of the situation. Attitudes are more influenced by the situation. The relationship between attitudes and personality traits is seen below.



The common use of the term "attitude" often fails to appreciate this distinction. Whenever you hear someone say "He has a bad attitude" (if it is about everything, it is not an attitude contingent upon the object, it is an enduring trait of the subject).

PERSONALITY IS TRAITS.
(enduring, integrated)

ATTITUDES ARE SOCIAL HABITS.
(changeable, diverse)

An attitude is always about a specific thing, an object, and describes the subject's understanding of that object, the emotional evaluation of that it, and his predisposition to act in a certain way toward it. So, each attitude can be dissected into three components: cognitive, affective, and behavioral.

The **cognitive component** refers to the subject's belief about the object in question. Here we are not talking about religious beliefs (which are doctrines about God and salvation) but **beliefs as factual statements that are empirically testable**. For example, "I believe that it is now about 73 degrees Fahrenheit in this room" is a belief in the sense of being a statement about my acceptance of a certain claim of fact. We could empirically verify the statement by getting a thermometer. Notice that my belief about the temperature in this room (unlike my religious doctrines) will frequently change when new information is supplied. I might readjust my estimate upward if I notice that I am perspiring, or if someone shows me a different thermometer with a reading of 76 degrees.

The **affective component** is how I feel about the object in question. This might be the **emotions** I experience when I am in the presence of the thing, or even start to think about it. The affective component can also refer to how I evaluate the object in question, especially how it fits into a larger scheme of **preferences, priorities and values**. Note that ethical and moral judgments should not be referred to as "beliefs" (because they are not empirically verifiable). Moral judgments are not based upon facts, but values, and are therefore part of the affective component of the attitude.

The **behavioral component** refers to what the subject tends to do in the presence of the object. When it comes to attitudes about political candidates or issues, the corresponding behavior is how you **vote** or to which side you might contribute your time or money. When it comes to attitudes about products and companies, the behavioral component is the consumer's decision to **purchase** the product.

Case Study: Ms. I, 18, has a strong attitude on the topic of abortion. She describes herself as Pro-Life (anti-abortion). Here is how her attitude could be diagramed into the three components.

Ms. I has an *unfavorable* attitude toward abortion. (We do not call attitudes *positive* or *negative*.)

COGNITIVE COMPONENT: Ms. I *believes* that the process of abortion results in the death of the fetus.

AFFECTIVE COMPONENT: Ms. I greatly *values* all human life, and says that it is *morally wrong* to kill the innocent. Ms. I accepts the doctrine of her Church that the protection of the life of the fetus is a higher *priority* than the right of the pregnant woman to terminate an unwanted pregnancy. When Ms. I thinks about the dead aborted fetus, she *feels* very sad, but also angry.

BEHAVIORAL COMPONENT: Ms. I has *participated* in several anti-abortion demonstrations. When an election comes up, she *votes* for Pro-Life candidates. If Ms. I were to become pregnant, she would not get an abortion herself.

Case Study: Mr. B, age 53, is an international businessman. He must fly between California and Mexico about a dozen times a year. He has tried just about every airline on that route, but his experiences and priorities have made him brand loyal to Volaris. Here is how we could diagram his attitude.

Mr. B has a *favorable* attitude toward Volaris.

COGNITIVE COMPONENT: Mr. B *believes* that Volaris has the highest percentage of on time flights.

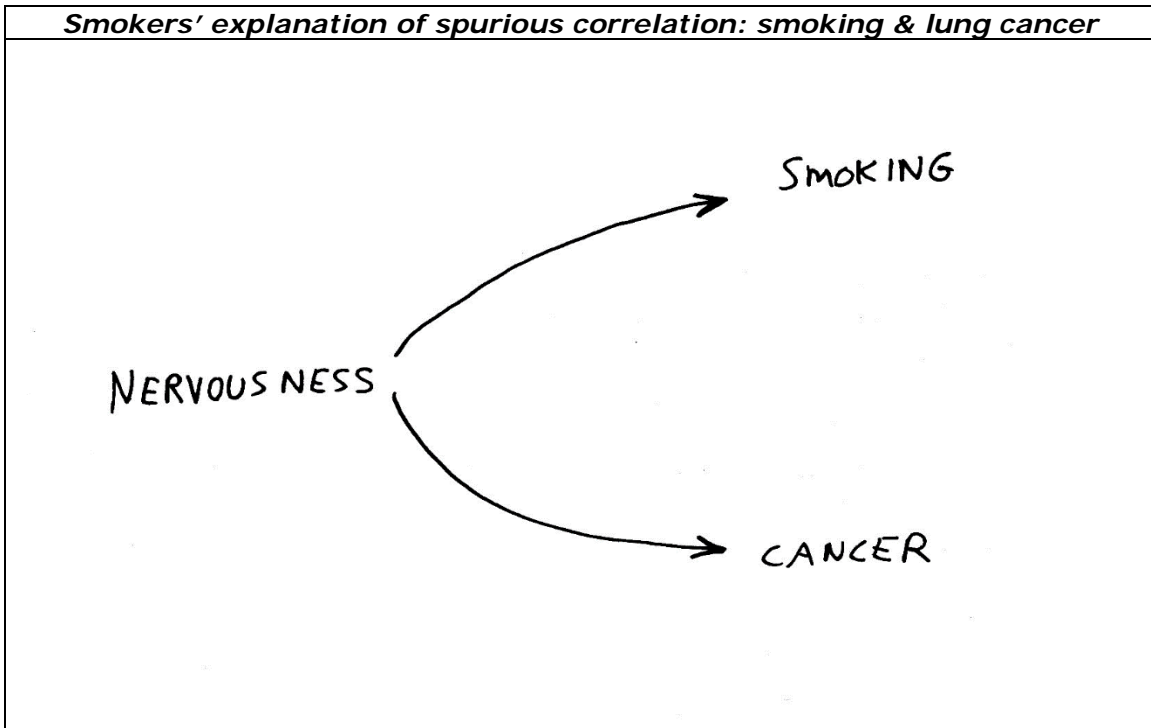
AFFECTIVE COMPONENT: Mr. B *prefers* to arrive at his destination on time. This punctuality is his *priority* when he selects an airline. He so greatly *values* this feature, that he would pay more for a ticket on an airline with a better on time record. When Mr. B arrives on time, he is *calm*. When he even thinks that he might arrive late, he gets very *nervous*.

BEHAVIORAL COMPONENT: Mr. B goes to the Volaris website and *purchases* a ticket.

In the examples above, all three components of the attitude are consistent. When they are not, the individual perceives a frustrating situation known as cognitive dissonance. Leon **Festinger** studied **cognitive dissonance** and found that when the components of an attitude disagree, belief may be the weakest of the three, and **people may change what they believe in order to match what they do**.

In 1954 the first Surgeon General's report about the dangers of cigarette smoking was issued. These were correlational data pointing out the link between smoking and lung cancer. While most smokers do not end up getting lung cancer, most cases of lung cancer are found in smokers. In the wake of this report, national polling organizations asked Americans if they believed that smoking caused cancer. Most non-smokers agreed that it did, and cited the Surgeon General's report as convincing evidence. Most smokers who were surveyed did not accept the causal inference, but suggested an alternative explanation for the correlation: "Maybe people get cancer because they are more nervous, and nervous people have a greater need to smoke." This is a plausible explanation of spurious correlation due to collateral effects.

(The actual causal link was not verified for another decade. Then experimenters forced dogs to smoke the equivalent of two packs of cigarettes a day in order to show that smoking greatly increases the risk of lung cancer.)



Research on cognitive dissonance	
<i>Researcher(s)</i>	Festinger
<i>Subjects</i>	Adults who responded to a poll
<i>Type of research</i>	Survey
<i>Independent Variable</i>	Whether or not the respondent was a smoker (but if this is a choice, it is a DV).
<i>Factors held Constant</i>	All persons received the same information: the Surgeon General's report about the correlation between smoking and cancer
<i>Dependent Variable</i>	Whether or not the respondent inferred a causal link between smoking and cancer.
<i>Results</i>	Smokers were less likely to infer that smoking was the cause of cancer
<i>Conclusion</i>	Smokers would experience cognitive dissonance if they believed that smoking caused cancer, and therefore rejected this belief rather than changed their smoking behavior.

What is more important in the development of the topic of cognitive dissonance is how Festinger interpreted the poll data. He inferred that smokers had greater resistance to the belief that smoking causes cancer because it would place them in a state of cognitive dissonance. We can assume that smokers and non-smokers alike have a similar affective

component (i.e., a preference for health and a long life). When the smoker hears evidence suggesting that smoking might cause cancer (cognitive component) he can either stop smoking (change the behavioral component) or he can reject the causal link. Since smoking is physically addictive, and not easy to quit, most smokers choose to minimize acknowledgement of the risk rather than change their behavior.

Another example of Festinger's research on cognitive dissonance comes from an experiment he did on college students who had volunteered to participate in a study. When the students arrived, they went into a room where they had to work individually on a rather boring task (thinking that their performance was the dependent variable being measured). When the students were done, they were asked to go out and talk to another student about volunteering for the experiment. Specifically, the students who had just performed the boring task were asked to describe the boring task as somewhat interesting. Half of the students were told that they would be paid ten dollars for talking to the next student, but the other half of the students were told that they would be paid only a dollar. Later, all of the original students were debriefed and asked if they honestly thought that the task was boring. Almost all of the group paid ten dollars agreed that the task was boring.

STIMULUS	ORGANISM	RESPONSE
= student paid =	=	= student comes =
= only a dollar =	=	= to regard the =
= to describe a	= student	= task as being =
= task as	=	= interesting =
= interesting =	=	= =

Research on cognitive dissonance	
<i>Researcher(s)</i>	Festinger
<i>Subjects</i>	College students
<i>Type of research</i>	Experiment
<i>Independent Variable</i>	Whether subjects were paid \$20 or \$1 to describe a boring task as interesting
<i>Factors held Constant</i>	All students performed the same boring task
<i>Dependent Variable</i>	What the students reported that they really thought about the task when being debriefed
<i>Results</i>	Students who were paid more were more likely to think that the task was really boring
<i>Ethical Considerations</i>	The students were forced to do a boring task and then encouraged to deceive other students about the nature of the task
<i>Conclusion</i>	The students who were paid less experienced a cognitive dissonance, and resolved it by changing their belief about whether or not the task was boring.

Festinger inferred that they had justified their lying by telling themselves "At least I am getting ten dollars for saying this." However, many of the students who had only been paid one dollar for describing the task as interesting subsequently reported that the task really was somewhat interesting. Festinger inferred that these subjects could not justify lying for just a dollar, so they must have convinced themselves that they were actually telling the truth when they described the task as interesting: behavior had changed belief.

The tendency of consumers and voters to retrospectively regard their decisions with greater confidence might also be explained by cognitive dissonance. After the behavior (the purchase or the vote) was accomplished, the reasons for it look more clear and compelling than before. The polls that were done before the 2000 presidential election in Mexico indicated that it would be a close one. Many voters were relatively undecided up to the last minute. Potential voters were asked to rate the favorability of Labastida, Fox, and Cardenas, on a five-point scale: very favorable, somewhat favorable, neutral, somewhat unfavorable, very unfavorable. The mean favorability ratings were pretty close. Right after Fox's victory in the election, the survey was repeated and his favorability ratings jumped, especially among those who admitted to having voted for Fox. Before the election, voters had thought "maybe Fox would be a little better" and after they had finally voted for Fox they thought "I know I did the right thing, Fox is definitely much better."

Another application of cognitive dissonance occurs in the case of effort justification. The more someone invests time, money, or effort, the more he is convinced that he made the wise choice, and that his efforts were worth it. A child who has to work and save for a bicycle will value it more, and take better care of it, than if the bicycle was given to him as a gift, with no effort on his own part.

Persuasion is the attempt to change attitudes. Persuasion can target any of the attitudinal components: cognitive, affective or behavioral. The **central route** to persuasion is to focus on the facts and reason, but this is not always the most effective technique. Just focusing on objective information (the cognitive component) will probably only be effective if the audience already agrees with the values and finds the behaviors otherwise acceptable. A message that focuses on values that the audience already holds can be very effective in spurring them to action.

According to the cognitive dissonance theory, the best way to change certain behaviors would be to get the audience doing something, and their hearts and minds will follow. This is why getting someone to invest the time and effort to attend a political rally is one of the best ways of making sure that he will convince himself that the candidate is really worth voting for: "He was worth going to that rally for, so he is definitely worth voting for." In the 2000 election in Spain, Prime Minister Aznar, who was generally known for his promptness, would intentionally make his audiences wait at least half an hour for his appearances, hoping that it would build their sense of commitment: "I waited a long time to see him, he must be good."

Sales representatives and politicians have developed a variety of techniques for persuasion, and know when one is more likely to be effective. The **foot in the door** technique starts with a small request to get the subject into the habit of complying, and then greater requests follow. The opposite approach is called **door in the face**, which begins with a large request (which the sales person expects to be rejected) but is then followed by a more moderate request which the initial anchoring will cause the subject to see as more reasonable by comparison.

Ethnocentrism refers to the fact that people tend to have more favorable attitudes about their own group, and less favorable attitudes about others. Pride in one's ancestry, political party or denominational affiliation is normal, but it can lead to dogmatism, stereotyping, prejudice, scapegoating and discrimination. **Dogmatic attitudes are those that are most rigid and intolerant.** Therefore, they are more resistant to persuasion. The word "dogma" comes from religion, and refers to a core of doctrine that should not be questioned.

<i>Profiling based upon stereotypes</i>			
		<i>Passenger is a terrorist</i>	
		Yes	No
P A S S E N G E R	Middle Eastern males	Very few passengers (but most terrorists)	Most Middle Eastern males going through the airport
	All other passengers	Extremely rare	Most passengers

Stereotypes are the cognitive component of attitudes about types of people (or other things). **Stereotypes are in the form of generalizations** that may (or may not) be based upon statistics such as averages or correlations. The problem arises when the subject overgeneralizes, and starts treating individuals in those classes as if all members of the class had the trait. To say that the crime rate is higher among African American males than it is among White males may be verifiable if we look at the averages. However, if I conclude that all African Americans are criminals, then I have accepted a stereotype that can lead to prejudice, scapegoating and discrimination. Many

stereotypes are not even based upon averages or correlations, but upon a handful of isolated, emotionalized examples that fit the individual's **confirmation bias**. "They arrested another criminal. His picture is in the paper, another Black man." Stereotypes are at the core of much of profiling used by law enforcement agencies.

Profiling should be based upon more than such stereotypes, and should involve statistical analysis. When the airport screeners select the 70-year-old grandmother or the couple traveling with an infant, this is almost certainly a waste of everyone's time. The only purpose of searching these passengers is to send a message: anyone might be searched. By focusing on the profile of the Middle Eastern male, the screeners would be more likely to catch most of the terrorists, however over 99 percent of the Middle Eastern males flying would be innocent, targeted only because of the stereotype. Such profiling might also convince other terrorists (e.g., another Tim McVeigh or another Manson family) that the opportunity exists for airline terrorism. It could also convince Middle Eastern males planning terrorist activities to try some other technique.

Scapegoating is the process of blaming an individual or an entire class of people for problems of which they are innocent. Some players on a losing sports team may try to scapegoat one player, "If you hadn't made that bad play in the second quarter..." The Irish joke that the English brought the fleas. Perhaps the most severe example of scapegoating occurred in Germany in the 1930s. This proud, industrious, well educated nation had suffered a great series of setbacks: losing the First World War, hyperinflation in the 1920's, the Great Depression and massive unemployment starting in 1929, and political instability in the early 1930s. One party rose to power based upon effective use of scapegoating. The National Socialist German Workers Party (the Nazis) claimed that all the problems of Germany could be blamed on the three percent of the population that was Jewish. *Why did we lose the war? Our soldiers fought bravely at the front! It must be those Jewish diplomats who sold us out during the peace talks. Why did we have the inflation? The Jewish bankers! Why did we have unemployment? The Jewish industrialists! Why do we have political instability? The Jewish radicals! Pornography? The Jewish writings, artists, and film directors!* As far-fetched as these claims may seem, Hitler was not the first or the last to use these **Anti-Semitic** (anti-Jewish) claims. In the Middle Ages, the Jews were blamed for the plague. Some current Middle Eastern leaders may blame the Jews for poverty in the Arab world. One explanation for these attempts at scapegoating is that leaders might be trying to distract the people from the real causes of their problems, and/or trying to use public wrath against the scapegoats to consolidate political power.

Prejudice refers to an attitude held without sufficient evidence.

Prejudice usually refers to attitudes about other classes of people, usually unfavorable attitudes. Most prejudice is at least in part based upon stereotypes, scapegoating and other dogmatic attitudes. Allport and Adler described the dynamics of prejudice and scapegoating: subjects try to feel better about themselves by denigrating someone else. Sixty years ago, Milton **Rokeach** found that in the South, White prejudice against African Americans was inversely related to socio-economic class. It was the poor Whites who were most opposed to

integration. This was to some extent a fear of competing with African Americans in the workplace, but also it related to the frame of mind "I may be poor, but at least I am White." If poor Whites accepted the idea that Blacks were not inferior, then there was nothing special about being White.

<i>Research on Prejudice</i>	
<i>Researcher(s)</i>	Rokeach
<i>Subjects</i>	Southern whites
<i>Type of research</i>	Survey
<i>Independent Variable</i>	Social class
<i>Factors held Constant</i>	All subjects were white, and living in the south
<i>Dependent Variable</i>	Prejudice against Blacks
<i>Results</i>	Prejudice against Blacks was greater among the lower class subjects
<i>Conclusion</i>	Racial prejudice serves to help one feel better about one's own low status

A related example comes from India, which for centuries had fixed social classes known as the caste system: Brahmin priest, noble, merchant, worker-peasant (and many sub-caste divisions, especially within the lowest caste). The great leader of the independence movement from Britain, Mohandas Gandhi, was also a reformer in the area of caste. Gandhi and other reformers tended to come from the Brahmin (highest) caste. Today, most Brahmins are convinced that their economic strength and educational attainments will not be threatened by abolishing caste inequities. The greatest opponents to these reforms have been members of the lower (but not lowest) groups, who do not have very much, and do not want to lose the privilege of being able to at least look down on someone else.

Discrimination refers to arbitrary behavior jeopardizing the rights of others. Discrimination often occurs in areas such as the workplace (hiring and promotion) and the real estate market. Discrimination is the behavioral component of the prejudicial attitude.

Case Study: Mr. U, 43, runs a property management firm in San Francisco. He is of Chinese descent, but his family has been in California for several generations. When he presented himself to a prospective client (the new owner of an apartment building who was looking for tenants), Mr. U displayed one of his prejudices, perhaps thinking that his client might also share it. "Don't worry, I only get tenants who are from Taiwan or Hong Kong. You have to watch out for Chinese right off the boat from the mainland. You rent to one of them and they put forty people into one apartment." His generalization about

the mainland Chinese is a stereotype. If he follows through on his actions, that would be discrimination.

Mr. U's rental practices are illegal in certain localities. Also illegal are hiring practices that undeservedly discriminate on the basis of ethnicity, gender, disability, national origin, religion, or age (over 40). Two classes not usually protected in hiring and rental discrimination are fat people and homosexuals.

Case Study: Mr. R, age 30, is a freelance technical writer. He was recruited by a head hunter who then interviewed him, and she was highly impressed with his talents. Mr. R owns a home in San Francisco with a male pediatrician, with whom he has been in a long term relationship. He is not "in your face" about his homosexuality, but it is not something that he hides. When the head hunter sent Mr. R as a candidate for a technical writing job with a client company in Oakland, the firm was reluctant to call back and give a verdict. Finally, the head hunter got through and was told "He would not really fit in here." Fortunately, the head hunter found Mr. R a better position with a "gay friendly" firm in Palo Alto.

Case Study: Ms. Y, age 36, had ten years of office experience before she left work to have two children and be a stay at home Mom until they were both in school. Now Ms. Y is trying to return to the work force, six years later and forty pounds heavier. She has not obtained a position comparable to the one that she had previously had with a different employer. One such job that she interviewed for was given to a slender 18-year-old right out of high school. The manager doing the hiring may have discriminated based upon a stereotype such as, "Fat people are lazy" ignoring Ms. Y's energetic performance in the interview and glowing references from her former employer in another state.

The experience of Ms. Y is not unusual: among White women, being overweight is correlated with earning less money. For those who oppose size-based discrimination, these data are evidence that discrimination does exist: overweight women had a harder time to get hired or promoted to the well paying jobs. For those hiring authorities who discriminate, these data might fit the confirmation bias: *overweight women earn less because they are lazier.*

One way to answer the question about the reality of discrimination is to perform an experiment where fictitious job candidates are presented, and the variable of size (or ethnicity) is manipulated. For example, in a class of graduate students working on their M.B.A. degrees, most of the students were already managers who had some hiring authority. Subjects had to rate candidates for a position. One candidate was described on half of the questionnaires as a male weighing 165 pounds, but on the other half of the questionnaires as weighing 365 pounds. All other background statements were the same, but this candidate was judged significantly less appropriate for the job when he was described as obese.

One of the great benefits of laws against discrimination is that they can begin to change prejudices and stereotypes. At first, people may hire African Americans, women, fat people, or gays just out of fear of a discrimination suit if these "minorities" are not hired. Hopefully, the resulting experience working alongside of others in a diverse workplace will overcome the stereotypes.

Research on Size discrimination	
<i>Researcher(s)</i>	Brink
<i>Subjects</i>	MBA students
<i>Type of research</i>	Experiment
<i>Independent Variable</i>	The weight of fictitious job candidates
<i>Factors held Constant</i>	The real qualifications of the fictitious candidates: education and experience
<i>Dependent Variable</i>	The subjects' ratings of the candidates
<i>Results</i>	The overweight candidate received much lower ratings
<i>Conclusion</i>	There exists job discrimination against the obese

QUESTION #13.2: What is attribution?

Attribution is the interpretation of behavior. It is like an inference: we observe someone's behavior and try to figure out *why* he did it. Can we attribute the behavior to **internal (dispositional)** factors such as intention, effort and/or skill, or to **external (situational)** factors such as luck or task difficulty?

Case Study: T, age 12, was up on a stepladder painting the side of his house. He told his ten-year-old little brother to hand him up a little can of the other color paint for the trim. The younger brother put the can on the little shelf of the ladder, but it quickly fell down, spilling the paint. T started yelling at his little brother. T has made a dispositional attribution, seeing the bad result as being caused by the little brother's inattentiveness.

Several factors influence attributions. One is the subject's past knowledge of the other person's behavior. Has T's little brother a history of being clumsy? (If so, that would argue for a dispositional attribution). Another factor might be observations of other results in the same situation, even when T's little brother was not involved. Has the ladder shelf failed before? (That would argue for a situational attribution.)

Most people are tempted to engage in the **fundamental attribution error**: excusing their own bad behavior with situational attributions, yet using internal attributions to blame others for bad behavior.

Case Study: Mr. A is driving on a difficult stretch of the 10 freeway. He is late for an appointment, when all of a sudden, the car on his left cuts in front of him in order to get an approaching off ramp. Mr. A brakes and makes a dispositional attribution: "That idiot, he did not even care how dangerous that was. He sure can't drive." A few miles later we find Mr. A in the left lane and he notices that his exit is fast approaching, and he cuts across two lanes of traffic (quite comparable to what the other driver had done just minutes before). Mr. A immediately comes up with a situational attribution of task difficulty: "They ought to give you more time to get over by announcing those exits in advance."

Attributions are reversed when the outcome is good, such as getting a promotion. Here, the subject is likely to use a dispositional attribution if he himself gets the promotion: "I earned it." If someone else got the promotion that he had hoped for, the subject might use a more situational attribution, "Some guys have all the luck."

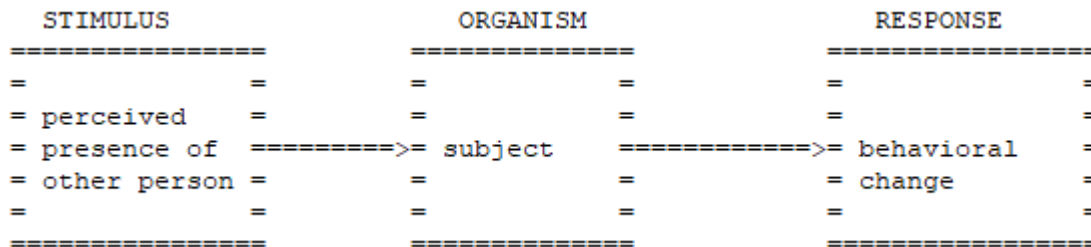
<i>FUNDAMENTAL ATTRIBUTION ERROR:</i> <i>we blame others for their bad behavior, but excuse it in ourselves</i>			
		OUTCOMES WERE	
		Good	Bad
E X P L A N A T I O N F O R	self	INTERNAL: <i>Deserved</i> "I am smart" "I worked hard"	EXTERNAL: <i>not my fault</i> "I was unlucky" "I was tired" "It was too hard"
	Other persons	EXTERNAL: <i>undeserved</i> "He was lucky" "It was too easy"	INTERNAL: <i>his fault</i> "He was lazy" "He was irresponsible" "He was stupid"

Adler would explain the fundamental attributional error as just another way that we try to avoid feelings of inferiority by diverting blame to the situation when we fail, but by using dispositional evaluations of others when they fail (in order to feel superior to them).

Case Study: Mr. D, age 35, is a supervisor at a manufacturing plant. His wife, Ms. D, is a stay at home mother of three. One particular week has been difficult at the plant, with Mr. D having to work late hours and weekends. When he comes home he is exhausted. He hugs his wife, but he just wants to relax in front of the TV with something to eat and drink. Instead of making a situational attribution ("He is tired from work") his wife makes a dispositional attribution ("He is cold, detached, and unappreciative of all that I do in the house"), and starts to talk, which Mr. D interprets as nagging, and he makes another dispositional attribution ("She is just a whiner, unappreciative of how hard I am working for the family") instead of a situational attribution ("She has been in the house with the kids all day long and is in need of some adult conversation").

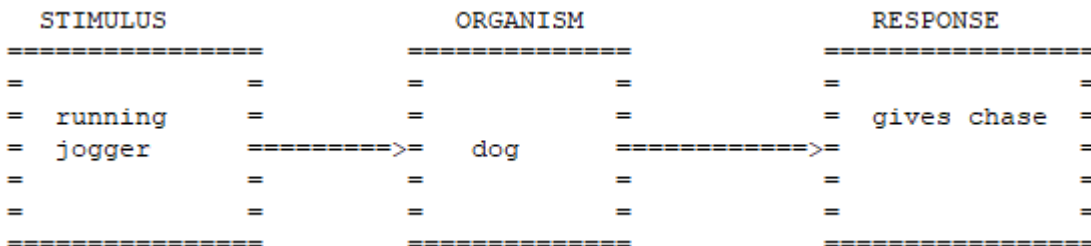
QUESTION #13.3: What is social influence?

Human behavior is greatly influenced by the presence and behaviors of other persons.



The simplest form of social influence is the **dyad, two persons interacting**. The behavior of each one serves as a stimulus for the behavior of the other. A dyad could be composed of two friends on the phone, two boxers in a bout, these two [dogs](#), a customer and a retail clerk, a worker and a supervisor, a psychotherapist and patient, or in the case of Mr. and Mrs. D cited above.

Let's return to the example of the street dog chasing a jogger. We have an interactive dyad with the behavior of each changing the behavior of the other.



STIMULUS	ORGANISM	RESPONSE
= charging = dog	= jogger	= stops and = makes a = throwing = motion

STIMULUS	ORGANISM	RESPONSE
= jogger = makes a = throwing = motion	= dog	= turns and = runs away

Let's return to the example of the street beggar. There is a second person in the dyad, the prospective donor.

STIMULUS	ORGANISM	RESPONSE
= passerby = approaches	= beggar	= says "Help = a homeless = Vietnam Vet"

STIMULUS	ORGANISM	RESPONSE
= sight of = beggar and = hearing his = words	= passerby	= puts a few = coins in the = beggar's cup

STIMULUS	ORGANISM	RESPONSE
= donation = given	= beggar	= says "God = bless and = keep you"

Crowds influence the behavior of individuals in special ways. A **crowd** is simply **a large number of people assembled at a given time in the same place**. Examples of crowds would be customers waiting to get through a checkout line, riders waiting at a bus stop, students waiting in line to register for courses, fans in the stands at a football game. Notice that crowds are a temporary phenomenon: once the customers get through the checkout line, or the football game is over, the members of the crowd get in their cars and go their separate ways. Although in each of these examples of crowds, the members did have a common purpose, that is not an essential feature of the crowd.

Modeling is one way that crowds influence behavior. The behavior of other members in the crowd may be taken as a norm to be imitated. Especially if someone is new to the situation (e.g., has never been in a registration line, or been to a football game) he may assume that this is just the way things are done here and go along with it.

Anonymity is a possible characteristic of crowds. You may have never seen these other people before, and may never see them again. Anonymity can also come from wearing uniforms (as in military combat) or disguises (as in Halloween or the Ku Klux Klan). Anonymity can lead to a **deindividuation** and loosen many inhibitions against violent, vandalistic, or other criminal behavior as individuals may figure that they will not be identified or held to account for their behavior. Anonymous mobs may riot or lynch.

Crowds do not have any internal organization to limit such mob behavior. The most that can be hoped for is that the people in the checkout line at the grocery store will remain neatly in line, each awaiting his turn without causing a disruptive scene, and the fans at the stadium will remain in their seats until the game is over, and then exit in an orderly fashion and go home.

<i>Bystander apathy or involvement</i>			
Step one	Step two	Step three	Bystander action
Does not notice victim	----->	----->	Does not take action
Notices victim	Does not define as emergency	----->	Does not take action
	Defines as emergency	Does not assume responsibility	Does not take action
		Assumes some responsibility	Offers assistance

Bystander assistance is another form of behavior that is influenced by the crowd phenomenon. There are instances of individuals being robbed or murdered while no passersby offered any reaction or assistance to the victim. When the victim and passerby know each other, assistance is more likely to be offered. If there are no other passersby, assistance is more likely to be offered. The subject's decision to stop and help is actually a series of classifications, a cognitive map. On step one, the bigger the crowd, the less likely any individual victim would be

noticed. On step two, the more unfamiliar the individual is with the situation, the less likely he would be to define it as an emergency. On step three, seeing other crowd members respond might convince the individual that "They already have it under control, so I do not have to get involved" but seeing no one else stop and intervene might convince the individual "If no one else is stopping, maybe I should not either; everybody else must have a good reason for not stopping."

Organizations may be an even greater influence on behavior than crowds are. **An organization is a structured, ongoing cluster of individuals sharing a similar purpose.** The workers in a place of employment would be a good example, whether they work for a private company, government agency or non-profit organization. The organization is enduring (semi-permanent) even if the individual membership changes over time. If we were to look at the workers of the XYZ company in 2000 and today, we might see many of the same old faces and a few new hires. Missing would be those workers who since 2000 have retired, resigned, died, or been laid off or fired. Consider the local high school football team in 2008 and today. Some of the players were cut from the team, others decided not to try out again, some got suspended from school, some moved out of the district, and hopefully most graduated from high school. The point is that the organization (the football team) endures even if the individuals come and go.

Unlike a crowd, the organization must have a common purpose and structured roles to meet that purpose. The fans in the stands may be a crowd, but the team on the field is an organization, sharing the common purpose of winning the game, and structuring itself into roles such as offense or defense or special teams; ball carrier or blocker or receiver, etc. When students are waiting in line to get their courses, that is a crowd, but once the students are in an ongoing class, that is an organization. Then the students share the common goals of getting through the class, learning something, and getting a good grade. The customers waiting in line at the grocery store are a crowd, but the workers at the grocery store are an organization with a common goal (making money by selling groceries), and structured roles such as butcher, checker, bagger, etc.

	Dyad	Crowd	Organization
<i>Examples</i>	Spouses Boxers Clerk/customer Worker/manager Patient/therapist Criminal/victim	Customers in line; fans at a stadium	Workers in a company; football team; religious congregation
<i>Internal Structure</i>	Usually roles	Assigned location, anonymity	Roles, Ranks
<i>Time frame</i>	Varies	Temporary	Enduring
<i>Common purpose</i>	Possible, but they may also have cross-purposes	Perhaps	Required

Organizations, as well as nations, have cultures. **Cultures are patterns of life comprised of roles and norms that are transmitted to new members.** Most of what takes place in military boot camp is not training on how to do a future specific task in the military, but an orientation to the roles and rules of the military culture. When a company hires a new worker it may provide both training (how to do the task of the specific position) and orientation (how to function in the corporate culture). On the national level, individuals might be enculturated to norms and roles through the public school system, religious organizations, the scouts, YMCA, Boys & Girls Clubs, and 4-H.

Research on roles	
<i>Researcher(s)</i>	Zimbardo
<i>Subjects</i>	College students
<i>Type of research</i>	Experiment
<i>Independent Variable</i>	Whether the student was assigned to the role of "guard" or that of "prisoner"
<i>Factors held Constant</i>	All subjects had to assume a role
<i>Dependent Variable</i>	How the subjects behaved
<i>Results</i>	"Guards" became brutal; "prisoners" became withdrawn and anxious
<i>Ethical Considerations</i>	The welfare of the subjects was being jeopardized, so the simulation was stopped early
<i>Conclusion</i>	Assigned roles have an impact on behavior

The power of an organization's **roles** was demonstrated by one of **Zimbardo's** experiments. He took normal college students and conducted a prison experiment in which the volunteers were randomly assigned to the roles of guard or prisoner. Zimbardo ended up stopping the simulation before it was scheduled to end because some of the guards had become too brutal, and some of the prisoners too anxious and withdrawn. Zimbardo was called as an expert witness in the Abu Ghraib trial in which U.S. Army prison guards were accused of brutalizing Iraqi prisoners. Zimbardo's point is that "the rotten barrel makes the apple rotten," so it was less the fault of the individual guards and more the fault of the way the prison had been set up and run. The guards had **deindividuated** and were being driven by group norms rather than their individual consciences.

Norms are rules governing behavior, and include mores and folkways. **Mores** are rules about what the culture considers to be **serious matters**. Violation of mores may bring severe sanctions from the culture. **Folkways** are rules about **less serious** things. Usually, matters of taste, fashion and etiquette are mere folkways. The violation of folkways may only call forth minor sanctions, such as disapproving looks or gentle chiding by peers or superiors. What a culture regards as a more or folkway may differ greatly from place to place and time to time.

CHANGING MORES AND FOLKWAYS AFTER THE SEXUAL REVOLUTION

		1910's	1930's	1950's	1970's	1990's
		-				
		-				
		-				
		-				
L		-				
E	M	-				
V	O	-				
E	R	-				
L	E	-				
	S	-				
O		-				
F		-				
		-				
						homosexuality as preference
S		-				
E		-				abortion a matter of choice
R	F	-				
I	O	-				more unmarried cohabitation
O	L	-				
U	K	-				most mothers work
S	W	-				
N	A	-				get out of a bad marriage
E	Y	-				
S	S	-				women may wear pants
S		-				

		1910's	1930's	1950's	1970's	1990's

In the U.S. norms for appropriate sexual behavior have changed over the last hundred years. Before World War I, there were strict ideals. Abortion and homosexuality were seen as clearly immoral. Sex was supposed to be in marriage only. Women who had children were supposed to stay at home and be homemakers rather than seek outside employment. If they were in a bad marriage, that is where they should stay (for the welfare of the children). Women were supposed to dress appropriately (long dresses). By World War II, some of those mores had relaxed into folkways. As women went to work in the defense plants, they began wearing pants. As many wartime romances broke up, the divorce rate climbed. By the end of the century, most mothers were working outside of the home; many couples were cohabitating prior to (or instead of) marriage. Things may had been illegal in most states at the beginning of the century (abortion and homosexuality) were now protected behaviors in many jurisdictions.

The above example of sexual mores becoming folkways shows how norms can go in one direction, but they can also go in the other. Some activities that were mere folkways fifty years ago have become mores. In the 1950s if you were riding a bus, smoking was governed by good manners (which usually meant offering the stranger next to you a cigarette before you lit up). Now, not smoking in public places has become a more, backed up by legal sanctions.

It is important to mention that we are talking here about mores and folkways, not about morality. Just because a society has no sanctions against a behavior does not mean that it is moral. Individuals must still decide on their own if they should engage in those actions. The eating of meat is not prohibited anywhere in the U.S., but millions of vegetarians have decided on their own that it is not moral to kill animals in order to eat them. Some form of gambling is now legal in most states, but millions of individuals have decided that it is not moral to participate in gaming or wagering.

One example of a norm is **proxemics, the study of the rules for the use of interpersonal space**. When the professor is standing in front of the classroom, and most students are more than a dozen feet away, that is a distance for public events, but not personal conversations.

\o/	i:	s	:	p
	n:	o	:	u
/ \	t:	c	:	b
	i:	i	:	l
	m:	a	:	i
	a:	l	:	c
	t:		:	
	e:		:	

After class if you have a question for the professor, you might catch him outside of the classroom. You would probably stand about two to four feet away during this personal conversation. If you got within a foot of him, he might back up a little, because you are getting into intimate space. Normally, we reserve intimate space for those individuals that we feel comfortable giving a hug to.

Rules for placing a home upon a lot are also governed by the norms of proxemics. In the U.S., especially California suburbs, the house is set back from the sidewalks and neighbors. This may be a mere custom (folkway) whose violations will only receive disapproving glances of passersby, or it might be a more in certain communities enforced by zoning and building permits. In Mexico, by contrast, houses are built up to the property line, and an inner courtyard takes the place of a front or back yard for garden and play areas.

Related to proxemics are the rules for interpersonal touching. In most dyads, the handshake is the appropriate form of touching between new acquaintances, and it must be the right hand, a certain length of time, and a certain strength of grip. Other forms of touching that might be acceptable on a football field, would be considered sexual harassment or battery in the workplace.

One example of a powerful source of normative referencing in the U.S. would be socio-economic class. All societies, human and animal, tend to segment and differentiate by function and by gradations of status and power. In modern free market economies, **social class is determined by perceptions of wealth, education, and occupational prestige**. Although American social class is not fixed like the castes of ancient India, about eighty percent of Americans end up in the social class of their parents. Most of the children of upper middle class parents go to college, while most of the children of the poor are lucky to finish high school. About ten percent of Americans (and many immigrants) move up from the class of their parents, and some move down.

<i>Socio-economic classes in America</i>			
SOCIAL CLASS	EDUCATION	HOME	OCCUPATION
High, elite	Post-graduate	Mansion	Investors, Executives
Upper middle	Post-graduate	Exclusive suburb	Managers, Professionals
Middle	Bachelors or some college	Suburb or city condo	White collar
Working, Lower middle	High school or some college	Old neighborhood, Apartments or Trailers	Blue collar
Low, poor, Marginalized, Underclass	Drop out	Housing projects	Unemployed, Unskilled, or Migrant

Social class dictates norms for behavior, including what clothes are appropriate, and whether it is acceptable to park a vehicle on the front lawn. The individual's very perception of the milestones in the life cycle may be determined by social class, with the higher classes having higher age norms for certain transitions. Bernice Neugarten asked a series of questions about age norms to steelworkers on Chicago's South Side, and then asked the same questions to upper middle class professionals in the suburb of Skokie.

Research on social class and the life cycle	
<i>Researcher(s)</i>	Neugarten
<i>Subjects</i>	Chicago area residents
<i>Type of research</i>	Survey
<i>Independent Variable</i>	Socio-economic class
<i>Factors held Constant</i>	Geographical location (Chicago metro area)
<i>Dependent Variable</i>	Perceived points in the life cycle
<i>Results</i>	Those with higher socio-economic status perceived later age points
<i>Conclusion</i>	Socio-economic class influences perception of the life cycle

Brink followed up the study in the 1970s in rural Mexico. He found an even more constricted life span, with adult responsibilities beginning in the teens and old age beginning about fifty.

Perceptions of the life cycle according to social class differences			
Question	Working class	Middle class	Rural Mexico
When should a boy shoulder a man's responsibilities?	18	24	16
What is the best time for a girl to get married?	20	25	16
When is a man an old man?	65	70	50

When rural Mexicans migrate to cities like Toluca and get a job in an automobile plant, their perception of the life cycle changes. Now, they expect to keep on working hard until age 65, and hope that their children will finish high school, and that their daughters will not marry as young as their mothers did. In a generation or two when some of their children succeed in rising to the middle class by virtue of starting a successful business or getting into one of the professions, the age norms will shift again, approximating those of the American middle class, helping their children through the university, and continuing on later on in their own careers.

High social class has a moderate correlation with successful aging. Middle and upper middle class aged tend to be healthier and more active than working class and lower class counterparts of the same age. Go to a senior center in a working class or lower class area and see a lot of people sitting around: "We worked hard all of our lives, and now we have earned the right to rest and relax." Go to a senior center in

an upper middle class area and see people learning new languages, engaged in volunteer service, dancing, and planning their next cruise: "We worked hard and invested our money while we were young so that we would have the ability to be active at this time of our lives."

Case Study: Mr. G, now age 74, had been a high school principal in a factory town in the Midwest. Most of the men in town tried to retire at age 62. Mr. G retired at 67. Many of the men from his town have escaped the cold winters by retiring to a part of Florida, where they could fish all year round. Mr. G retired to a suburb of Guadalajara. (He is not alone, for there are over a hundred thousand retired Americans in the greater Guadalajara area.) Although he does enjoy fishing and lives close to Lake Chapala, Mr. G gets to fish only a couple of days a month. Most of the time he is too busy as a volunteer administrator with the local American Legion Hall or working with several Mexican charities. One of his new interests is *Charrería*, traditional Mexican horsemanship and costuming. Every few months, he and his wife travel around Mexico to some part they have not seen. Every year, they try to travel to some other country they have not seen.

The **just world hypothesis** is a variant of the fundamental attribution error. It says that those people who have a comfortable life think that life is fair, while those who have a difficult life think that things are unfair. This means that social class is a source of stereotypes, scapegoating, prejudice and discrimination. Middle class people often define themselves by who they are not (lower class). Subscribing to the **just world** hypothesis, middle (and upper) class individuals tend to use dispositional attribution to explain the relative success of the different classes: "I live so well because I earned it; those lower class people have such a hard life because they have been so lazy and irresponsible."

Social class norms also influence choice of spouse. Parents are delighted if their children (especially their daughters) can marry up into the next class, and horrified that a daughter may throw away the benefits of her class by marrying down. This gender differential can be explained by the fact that it is the man who is the traditional breadwinner, and whose occupation would determine the status of the entire nuclear family created by the marriage.

Case Study: Mr. B grew up in a middle class family. He did well in college and went on for an M.B.A. degree and seemed poised for a career in business that would put him into the upper middle class at least. His family was pleased when he announced that he was going to marry an immigrant woman with little formal education who had worked as a maid. They thought that she would be a good homemaker and helpmate who would not take the spotlight off of their son with a competing career. On the other hand, when Mr. B's own parents married a generation earlier, his maternal grandparents were very disappointed when their only daughter was going to lower herself by marrying a factory worker.

Alienation is the feeling that one is cut-off from one's normative culture. Alienation is an uncomfortable emotion. Alienation has become more widespread in the U.S. over the past five decades. Many people respond to alienation by seeking a new, rigid culture with clear mores for reference norms. Street gangs are organizations with clear goals (even if the goals are rejected by the larger, national culture), definite roles, and harsh sanctions for the violation of mores. Notice that such gangs are most popular among those who are most marginalized and alienated from the larger national culture (poor, urban youth).

STIMULUS	ORGANISM	RESPONSE
= lack of =	=	= alienation =
= contact with =	= disad- =	= followed by =
= norms of =	= vantaged =	= gang =
= main culture =	= youth =	= activity =
=	=	=

Affiliation means seeking the presence of other people. When people become confused or frightened, their need to affiliate increases. In one experiment, psychology students were told to report in the afternoon to participate in an experiment. They were randomly assigned to see a presentation describing the experiment in one of two rooms. In one room the students were shown a small device that would fit around a finger and told "This will give a mild electric shock, a tingle that most of you will not be able to feel. This is an experiment in your sensitivity to that tingle. As soon as you detect the tingle, press the button, and the electricity ceases." The other room saw a large device that sent crackling sparks across the room and were told that it was an experiment to measure pain threshold. All students were told to wait in the hall and they would be called in one at a time to be shocked. Actually, no students received either kind of shock. The purpose of this experiment was to see how the students would react to the prospect of receiving a shock. Students from the first group tended to sit down and read while they waited, or conversed in pairs. Students from the second group tended to stand and talk in larger numbers, "Do we have to do this for the class? Are you going in there? Do you think we should just go back to the dorm?"

STIMULUS	ORGANISM	RESPONSE
= frightening =	=	=
= apparatus =	=	=
= for giving =	= students =	= affiliated =
= electric =	=	=
= shocks =	=	=

Attraction is different from affiliation. **Attraction is being drawn to specific others.** Attraction might be the first step to relationships involving love and/or respect. Factors that can influence attraction might be physical appearance or common values. Factors that might lead to a longer relationship might be intimacy, passion, and commitment.

Equity theory holds that most people will pair up with someone who is at a comparable level of attractiveness. When a person settles for someone who is at a lower level of physical attractiveness, the more attractive partner usually expects some form of compensation in return. When we see couples of similar levels of attractiveness, we regard that as the normal state of affairs. When we see couples of differing levels of attractiveness, we speculate about what the compensation might be.

OBSERVATION	INFERENCE
Handsome man with a homely woman.	"He must walk all over her."
Beautiful woman with an old, short, fat, bald man.	"He must be rich."

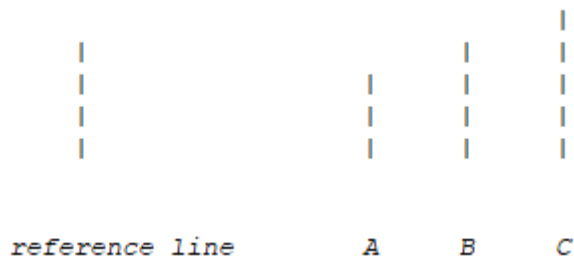
Women and men may have different priorities when it comes to looking for an ideal partner. One social psychologist, Goode, ran different fictitious personal advertisements. More men responded to an advertisement about a beautiful waitress than responded to an ad about an average looking female lawyer. More women responded to an ad about an average looking male lawyer than responded to an ad about a handsome cabdriver.

<i>Research on attraction</i>	
<i>Researcher(s)</i>	Goode
<i>Subjects</i>	Men and women who responded to personal ads
<i>Type of research</i>	Experiment
<i>Independent Variable</i>	How a fictitious person was described: average or good looks; average job or lawyer
<i>Dependent Variable</i>	How many responses each advertisement received
<i>Results</i>	Most males responded to an attractive woman; most females responded to a high status job
<i>Ethical Considerations</i>	The subjects were tricked into thinking that a real person was available and potentially interested in them
<i>Conclusion</i>	Men care about physical attractiveness while women care more about socio-economic factors

There are many factors other than initial physical attraction to explain the success of long term dyads. Similarities of values are probably more important than other types of similarities (e.g., age, intelligence, education). Complementary differences also have a role

(e.g., a dominant choleric might team up with a submissive phlegmatic). A good analogy might be a successful football team. You cannot build such a team by taking the best quarterback and cloning him. Having eleven of him on the field is not going to win many games. A good team needs someone to pass the ball, but also someone to catch it, someone to rush, to kick, to punt, and to block. A diversity of skills all working toward the same goal makes for an effective team.

Conformity means that individuals bring their behavior or thoughts into line with social norms. The higher an individual's anonymity, self esteem or status within a group, the less he will tend to conform. The larger the group, the greater the conformity. The more unanimous the group, the greater the conformity. Solomon **Asch** studied high school males who wanted to apply to a service academy so that they could become military aviators. They were told to show up for a group interview. After about twenty minutes of questions such as "why do you want a career in the military," the subjects were told that pilots needed to have good vision, so part of the interview would be a test for vision. On one side of the room was a large card with a ten-inch reference line on it. On the other side of the room was a card with three lines, one of which was the same length as the reference line.



The interviewer then went around the room asking each interviewee to announce which line on the right was closest in length to the reference line on the left. The first few "interviewees" who responded were actually confederates of the interviewer, and they had been instructed to give the wrong answer A, instead of the right answer B. The last person to give his answer was the real subject of this experiment. Many of these subjects agreed with the group and conformed to the wrong answer.

Depending upon different factors, between a third and four-fifths of the subjects agreed with the wrong answer given by the rest of the panel. By manipulating a variety of independent variables, Asch found that if just one other interviewee came out with the right answer, then the subject was likely to give the right answer. Also, if the other interviewees were perceived as having lower status than the subjects (e.g., they are going to West Point to be infantry officers) the subjects were likely to give the right answer (perhaps the subjects then thought "We pilots have better vision.")

STIMULUS	ORGANISM	RESPONSE
= other people =	=	=
= give the =	=	= conforms, =
= wrong answer =	= student =	= giving wrong =
= about the =	=	= answer also =
= line length =	=	=

Research on conformity	
<i>Researcher(s)</i>	Asch
<i>Subjects</i>	High school males being interviewed
<i>Type of research</i>	Experiment
<i>Independent Variable</i>	What the other "interviewees" announced was the right answer
<i>Factors held Constant</i>	Age, gender, situation
<i>Dependent Variable</i>	Whether the subjects would give the right answer
<i>Results</i>	Many subjects gave the wrong answer given by the other "interviewees"
<i>Ethical Considerations</i>	Subjects were deceived and felt foolish afterwards
<i>Conclusion</i>	Most people conform under social pressure

Obedience is complying with the demands of an authority figure.

Milgram studied obedience by getting students to volunteer for what they thought was an experiment on the role of punishment in learning. The students were taken to a special lab and introduced to a researcher (wearing a white coat who would conduct the project) and to a man who would function in the role of learner in the next room. The subject was told that he would instruct the learner on how to do a task by using an intercom, and the learner in the next room had to complete the task correctly, and if he did not, the subject was to administer progressively stronger electric shocks as punishment.

Things went along well for a while with the "learner" apparently performing well and no shock was required. Then the progress stopped and the subject was told to administer the first, mild shock. After several of these learning failures calling for shocks, the "learner" in the other room started to object to the pain. At higher voltages, he screamed, then pounded on the wall, then was silent. In reality, the person in the other room at the other end of the intercom was not performing any tasks or getting any shocks. He was just an actor who pretended to be getting shocked. The subject of this research was the student who had been assigned the instructor role and to administer the shocks.

STIMULUS	ORGANISM	RESPONSE
= authority in =	=	=
= white coat =	= volunteer =	= obeys the =
= reminds him	= in the	= authority =
= that he agreed	= "instructor" =	= and gives =
= to participate	= role =	= the shock =

<i>Milgram's research on obedience</i>			
Volts	Label	What "learner" does	Subjects who obeyed
30	Slight	Silence	100%
90	Moderate	Grunt	100%
150	Strong	"Stop, I can't go on"	100%
210	Very strong	"Stop, I can't go on"	100%
270	Intense	Screams, pounds on wall	100%
330	Extreme	Silence	72%
390	Dangerous	Silence	65%
450	XXX	Silence	65%

Follow up experiments found that the subject's obedience was more likely if the authority figure was seen as affiliated with a prestigious institution. Several factors tended to increase the likelihood of disobedience. If the subject and "student" had met and shaken hands, the subject was less likely to apply shocks. If the subject had observed a previous subject in the instructor role refuse to give a shock, that greatly increased the chances of disobedience.

<i>Research on Obedience</i>	
<i>Researcher(s)</i>	Milgram
<i>Subjects</i>	College students
<i>Type of research</i>	Experiment
<i>Independent Variable</i>	Presence of the investigator reminding the subject that he had agreed to fulfill a role
<i>Factors held Constant</i>	All subjects were in the role of "teacher" who administered shocks
<i>Dependent Variable</i>	Whether or not the subject obeyed the authority and administered the shocks
<i>Results</i>	Most subjects obeyed and administered shocks labeled as dangerous
<i>Ethical Considerations</i>	Subjects were deceived and felt badly afterward for having obeyed so blindly
<i>Conclusion</i>	People readily obey authority figures

Cult is a somewhat derogatory term for a **new religious movement**, especially one with unusual theological doctrine or one that is abusive of its membership. Cult leaders tend to be charismatic individuals whom the followers find attractive and whom they must obey without question. Individuals with high alienation from the larger culture, and with low self esteem, are more likely to join cults. New members tend to affiliate, conform and obey very strongly, dogmatically accepting new doctrines. Robert **Adorno**'s typology may be useful in understanding those individuals most likely to be attracted to cults: authoritarians rather than egalitarians.

Many cults are apocalyptic, preaching an end of the world scenario. Many cult members may experience a cognitive dissonance if a predicted end of the world does not occur on schedule, and because they have so committed themselves to the cult by their previous behavior, they may readily accept a trumped up explanation and continue on in their membership. "God saw their faith and decided to be merciful for now."

However, which religious organizations are considered cults by outsiders often tells us more about the stereotypes and prejudices of the outsiders rather than the practices of the religious movements.

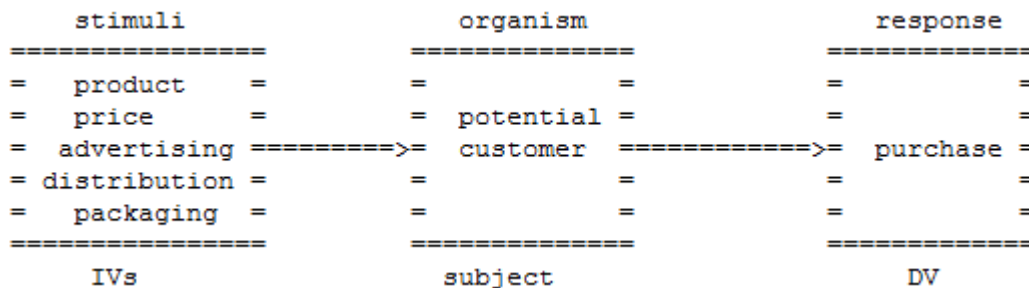
UNIT 14: APPLIED

Most of the branches of psychology discussed so far (experimental, comparative, developmental, social) involve **basic research** that attempts to support theories about why people do what they do. **Applied research** tries to come up with specific solutions for real world problems. Most experimental, social, developmental, and comparative psychologists work for universities where they engage in teaching and/or grant-funded research. Most applied psychologists work for private companies, but some are in private practice as consultants, and others work for the government or non-profit agencies, and a few even teach in universities. **Applied fields of psychology (e.g., industrial, consumer) are growing most rapidly and have the highest pay.**

QUESTION #14.1: What is consumer behavior?

Consumer behavior is psychology applied to the marketplace. This is actually a hybrid endeavor, drawing upon sociology, anthropology, and economics as well as psychology to gain a comprehensive understanding of the consumer. This field is rooted in the concerns of those who attempt to market products and services. The relevant topics and issues include advertising, sales, customer satisfaction, brand loyalty, decision making and product development. The branch of social psychology may contribute the most to this field, but the study of sensation, perception, conditioning (classical and operant), modeling, memory, motivation, and personality are also relevant.

The main message that experts in this field have for sales and advertising professionals is "never assume that you know the customer: do research!" The potential consumer is the subject of this research. Independent variables include the six P's of marketing: product, packaging, promotional campaigns, places of distribution, price, and purchasing options. The dependent variable is how the potential customers respond: how much of the product is purchased?



More so than other branches of psychology, consumer behavior makes use of **qualitative** research techniques. These techniques are similar to the case study; providing such insight into the complexities, suggesting future hypotheses to be investigated, but not providing definitive verification. The starting point of much marketing research is the

qualitative technique known as the **focus group**. Potential consumers are interviewed in order to understand what their concerns might be, what they are looking for in a product, what kinds of advertisements they would find appealing (or offensive), and most importantly, how they go about making the purchase decision.

Case Study: While most universities are either owned by state governments or not-for-profit private organizations, several private universities are profit-making institutions owned by corporations whose stock is publicly traded on exchanges. One particular proprietary university had a mission of becoming the largest university in America serving adult, re-entry students. Early focus groups of working adults who were considering going back to college to finish up their degrees indicated that there were some concerns even greater than the cost of tuition. As students thought about going to the nearest state university, they were discouraged by the long drive at night and the difficulty finding parking. Even if they were ready to start school now, they would have to wait about a year to apply and then have to worry about waiting in line to register. This particular university developed a system of branch campuses in rented office buildings close to freeway exits. The potential student could call an 800 number and find a convenient location where a class will be starting the following week. (While this has led to a profitable corporation, it does not necessarily guarantee a quality education.)

Surveys are also a major part of research in consumer behavior. Sometimes these involve face-to-face questionnaires of customers in stores or malls. Another technique is to include a questionnaire for new customers along with a mail in product warranty card. Some grocery stores encourage customers to have discount "club cards" which enables the store to build a database on each consumer: how much was spent, which products were purchased, even what time of day. Websites often put a "cookie" on the viewer's computer so that it can track other websites visited. When all these data are put together, interesting correlations emerge, from such **Big Data** such as people who shop at WalMart with the American Express card have low credit balances, but good credit ratings. This new field, known as **Analytics** involves computer analysis of such data.

Experiments can be conducted either in laboratory conditions or else in the field (e.g., running one advertising campaign in Cincinnati, and comparing its results with that of another campaign run in St. Louis). New technology allows researchers to measure whether a television is on, who is watching, or (in the laboratory) how well an advertisement captures the attention as measured by a tracking of eye movements or brain metabolism.

Perhaps the greatest theoretical advance in consumer behavior over the last hundred years has been the concept of **segmentation and targeting**. The marketplace is not monolithic, but divisible into distinctive and identifiable **niches**. The success of a product or promotion depends upon its ability to **find a niche** and succeed there. **Demographic** segmentation is based upon measurable socio-economic background factors

(e.g., age, gender, residence, education, income). **Psychographic** segmentation was developed principally by the followers of Maslow, and attempts to divide the marketplace along the lines of personality types. **Benefit** segmentation focuses on developing a product and promotional campaign geared to the potential customers' understanding of what they need. When all of these segmentations are put together, the marketer knows that the segment of the market interested in new luxury cars is not the same segment as those who are looking for parts to fix up old cars, and there must be an emphasis on different advertisements, in different media: Match the product with the customer in medium and message.

Market Segmentation			
Approach	Popular	Focus	Examples
<i>Demographic</i>	1950s	Socio-economic	Age, gender, income, education, geography (e.g., men drink beer, women buy laundry detergent)
<i>Psychographic</i>	1970s	Personality	Types, traits, dynamics (e.g., Mustang versus station wagon)
<i>Benefit</i>	1990s	Needs, wants	Shoes, office supplies (e.g., computer owners need software)

Case Study: In 1987, Diane Feinstein was retiring as mayor of San Francisco. She endorsed centrist Democrat, Jack Molinari. He had a major opponent in a Republican businessman, Roger Boas, and a minor opponent in state legislator Art Agnos, a liberal Democrat. Both Molinari and Boas had well funded campaigns, and bought full page ads in the *San Francisco Chronicle*, a newspaper read all over northern California, and spots on the big radio and TV stations. When the votes were counted the winner was ... Art Agnos!? Most people in northern California had not even seen one of his ads. He had a small campaign budget, so he focused on his demographic target by sending a mailer to every home and apartment in San Francisco (where the voters lived) while Molinari and Boas spent millions reaching residents all over northern California (most of whom were not even registered to vote in San Francisco).

Case Study: Mr. Z, 53, is the street beggar. We can view his potential donors as a market segmented demographically. After years on the streets, Mr. Z has come to this profile of the most likely donor: white, female, young, rich. He is not certain about what is going on in their heads, he just knows that he is better off outside of a women's clothing store than outside of a hardware or computer store.

Case Study: In the 1990s, a bank ran a strange newspaper ad. The top half advertised a sale on Nehru jackets, love beads, and turtlenecks. The bottom half of the ad gave the details for a line of credit to be based upon equity in one's home. This ad made use of very effective targeting based upon age. The clothing described in the top part of the ad was in style during the summer of 1967. Anyone who was a teen or in the early 20s at that time would not be able to resist reading the rest of the ad. By the 1990s, these same people would be forty-something, and most of them would have owned their homes for enough years to have

built up a good deal of equity which they might want to borrow against to pay for a child's college or wedding.

Case Study: Ms. T, age 22, is a recent college graduate just beginning work with a large accounting firm. She has some student loans to pay off because she elected not to work while she was going to school in order to get through faster. She is going to need a car, and she has decided to purchase a new one. Demographically, she is female, single, and no children, living in southern California's "Inland Empire" flatlands. Psychographically, she is a serious, calm, confident, future-oriented person. The kind of benefits she wants in a car is mechanical reliability and something that can take her all the way to Orange County each day for her job. She has no particular hobby that would require a special vehicle. She decided on the cheapest Saturn.

Example of Inferences based upon Segmentation Stereotypes		
Approach	Ms. T	Marketers infer that she wants . . .
<i>Demographic</i>	Female	Automatic transmission
	Young	Not a Buick
	Educated	Not lowered or raised
	Flatland	Not four wheel drive
	Non-parent	Not a large sedan or van
<i>Psychographic</i>	Serious, calm	Not high performance
<i>Benefit</i>	Some debt	Not too expensive
	Mechanical	Not British or Italian
	Long drive	Four cylinder
	No hobbies	Not an SUV, not a truck

Perhaps some of the inferences seem overly determined by stereotypes about different types of cars and the people who drive them: not every woman prefers an automatic transmission, but most do; not every driver of a Buick is over 60, but that make of automobile does have a high average owner age. These demographic, psychographic, and benefit clues could have predicted that Ms. T was a potential Saturn customer.

There were models of other vehicles that Ms. T could have considered, but she was thinking Saturn from the beginning. Those ads really appealed to her and portrayed the car as something made just for the no-nonsense practical person that she saw herself as being. Other small cheap cars had ads with loud music, pictures of the cars driving fast along windy roads or through mud; the kind of TV commercials she would flip away from. The Saturn commercials were properly targeted to the demographic, psychographic, and benefit segments who would be interested in that kind of car.

Another task of psychologists in the field of consumer behavior is to develop and sustain favorable attitudes toward companies and products. This can be accomplished through advertising, publicity, and the use of coupons and free samples.

Case Study: In the early 1970s Standard Oil was the most hated company around. In 1973 there was a reduced supply of oil from the Middle East. The price of a gallon of gasoline and home heating oil doubled. Worse yet, some gas stations were running out of gasoline. Panicked drivers

waited for hours in long gas lines just to fill up their tanks in case there would be no gasoline tomorrow. When high oil company profits were announced, the public blamed the oil companies for contriving the shortages just to boost prices.

STIMULUS	ORGANISM	RESPONSE
= Standard Oil Company logo	= TV viewer	= anger

The first attempted solution by Standard Oil was to attack the cognitive component of the unfavorable attitude. They ran an advertisement with a talking head: "Hello. I am an accountant with Standard Oil. Many people think that my company is making exorbitant profits out of the high prices you pay at the pump. Out of every dollar you pay at the pump, we get only three cents profit. Thank you." Everything in the ad was factual, but the public did not buy it. They even thought that the actor didn't look like a real accountant (even though he was not an actor, but a real accountant). When people are upset, they may not listen to the facts.

STIMULUS	ORGANISM	RESPONSE
= facts about Standard Oil Company	= angry TV viewer	= rejects facts

The next attempt focused on the behavioral component. Standard Oil set out coupons. "When your Chevron station is out of gas, come in anyway. We want to buy you a cup of coffee and give you a free tire rotation." When the customers came in, they had a chance to chat with the local service station owner about how neither he nor Standard Oil were making easy money during this period of gas shortage. Getting the customer to come in for the free tire rotation also set up a cognitive dissonance within the unfavorable attitude structure. "If Standard Oil is such a horrible company, why I am dealing with them? If Standard Oil is just out to rip me off, why are they giving me a free tire rotation?" This was a clever application of cognitive dissonance: changing behavior in order to change other attitudinal components.

The last attempt focused on the affective component, and resulted in a series of TV ads designed to change the emotion associated with Standard Oil from anger to joy. One advertisement was a cartoon about a dinosaur eating grass, then he died and went into the earth and became oil, then a Standard Oil engineer found the oil, and it was drilled,

and refined into gasoline, and brought to the Chevron station, and then a motorist pulled up and filled his tank, and as he drove away, the dinosaur stuck its head out of the tank and roared. Viewers chuckled and they had a joyous moment, and then the Standard Oil company logo appeared on the screen.

situation at the beginning

(initial stimulus)		(organism) [PASSIVE]	(response) (elicited)
STD OIL LOGO	----->	VIEWER	-----> ANGER

pairing of stimuli during ad

(initial stimulus)	(unconditioned) stimulus)	(organism) [PASSIVE]	(response) (elicited)
STD OIL LOGO	----->	CARTOON	----->
		VIEWER	-----> PLEASANT

result of ad

(reconditioned stimulus)		(organism) [PASSIVE]	(response) (elicited)
STD OIL LOGO	----->	VIEWER	-----> PLEASANT

This ad campaign worked so well, that five years later when the Revolution in Iran led to another oil crisis, Standard Oil ran a newspaper advertisement explaining its situation. At the top of the ad was a picture of the cartoon characters: the engineer and the dinosaur.

QUESTION #14.2: What is industrial psychology?

Industrial / organizational (I/O) psychology is the scientific study of job-related behaviors. The subjects are workers (or candidates for employment). The dependent variables are behaviors related to work: output, productivity, accidents, absenteeism, turnover, workers' attitudes. Anything resulting from a worker's performance, choices, decisions, or preference is usually regarded as a dependent variable, as are scores on tests. Independent variables are potential causes of, or influences on, behavior, and can include background factors (e.g., gender, age) and current environmental stimuli, and in I/O that would include training, physical environment, compensation and supervision. Such variables are usually independent of worker choice or preference.

stimulus	organism	response
= pay =	= workers =	= productivity, =
= benefits =	= =	= quality, =
= supervision =	= job =	= accidents, =
= ergonomics =	= applicants =	= absenteeism, =
= =	= =	= turnover =
=====	=====	=====
IVs	subjects	DVs

The first task of the I/O psychologist, whether she works for a private company, government agency, non-profit organization or the military, is job analysis. This is the process of coming up with a job description (which defines what the worker is to do or be responsible to get done), a job specification (which defines the ideal person to have that job), and a job evaluation (which describes an appropriate range of compensation a person should receive).

Job descriptions must focus on behaviors and/or responsibilities. A job is comprised of specific tasks, which are the smallest units of a job, each with a clear beginning and end. A job description may also include information such as when (work schedule), where (work site), and why (statement of purpose) the job is to be done, but these are secondary concerns. Here are examples of two job descriptions:

JOB TITLE: President of the United States. The president will ...

- campaign for the office during a national election
- raise funds for this campaign
- appoint people to cabinet positions, judgeships, ambassadorships
- hold press conferences and deliver speeches as necessary
- submit a budget to Congress
- sign or veto bills passed by Congress
- appear at state dinners
- command the armed forces
- negotiate with heads of state and their representatives
- consider requests for pardons and clemency

JOB TITLE: beautician (hair stylist). A beautician will ...

- unlock the shop at 8:30 am Monday through Saturday
- clean the shop before 9:00 am
- answer the telephone and schedule appointments
- advise clients about hair styles
- wash, dye, cut, dry, curl and style clients' hair
- receive and record client payment
- inventory and purchase supplies
- clean up the shop before leaving
- lock shop after 6:00 pm Monday through Saturday

The usual technique of job analysis begins with the study of incumbents (workers who now hold the position) via field observation, interviews, job diaries or questionnaires.

A job specification is a statement about the characteristics of a person who is acceptable to be hired for the position. An example of a job specification for a beautician would be "holds current state beautician license; has at least two years of experience as a beautician." Job specifications can get a company into trouble with the ADA (Americans with Disabilities Act) if the specifications stand in the way of disabled potential employees who could perform the job description if "reasonable accommodation" were made to their disabilities. Reasonable accommodation for someone in a wheelchair might be easier for the position of computer operator than for the position of fire fighter.

Job evaluation is supposed to ascertain what individual employees in large organizations should be paid. This is done by listing the compensable factors associated with each position's job description and specification (e.g., education, hazards, supervisory responsibilities). Inadequate job evaluation can lead to male carpenters being paid more than female nurses. "Comparable worth" is an approach to redressing such discrimination. Another gender bias problem associated with managerial careers is the "glass ceiling" (e.g., women may be promoted

to be nursing supervisors or office managers, but rarely are they promoted all the way to hospital CEO's).

I/O psychologists are usually in charge of the organization's **performance evaluation** system. The measurement of worker performance should start with the job description, attempting to precisely measure relevant aspects such as output, speed, quality, and/or safety. The measurements may be based upon the worker's behaviors, outcomes, or traits. (The last approach is the least relevant, and most open to bias.) Performance evaluation measurements become the operational definition of these variables. **Valid** measures focus on the most relevant aspects of performance and avoid both criterion deficiency (not measuring what we should) and criterion contamination (measuring something else in addition to, or instead of, what we should). It is important that the measurement of criterion variables not be contaminated with the measurement of predictor variables (independent and dependent variables which describe what might be measurable about an applicant prior to hiring). A good way to maximize relevance and minimize bias would be the use of Behaviorally Anchored Rating Scales (BARS) that describe specific levels of behavior.

BEHAVIORALLY ANCHORED EVALUATION SCALE

Worker being evaluated _____ Job Title _____

Date of evaluation _____ Name of Evaluator _____

How often does this worker meet or exceed the production quota?

ALWAYS ALMOST ALWAYS MOST OF THE TIME SELDOM

What percent of this worker's production meets quality standards?

UNDER 50% 60% 70% 80% 90% OVER 95%

How often does this worker arrive on time?

ALWAYS ALMOST ALWAYS MOST OF THE TIME SELDOM

How often in the last year did this worker have unexcused absences?

NEVER ONCE SEVERAL TIMES MANY TIMES

How often in the last year did this worker have a disciplinary incident?

NEVER ONCE SEVERAL TIMES MANY TIMES

How often in the last year was this worker at fault for an accident?

NEVER ONCE SEVERAL TIMES MANY TIMES

The **reliability** of measures of performance refers to the consistency of rating a given worker regardless of who is doing the rating (inter-rater reliability), when the rating is done (test/retest reliability), or which of several possible formats of evaluation were used (alternate form reliability). All of these forms of reliability are expressed as correlations between the measures. If there are several components to performance evaluation, a high positive correlation demonstrates internal reliability, while low (or negative) correlations demonstrate that the job is multi-factorial, composed of unrelated components.

Performance evaluations can lead to legal action if they unfairly discriminate against workers in protected categories (e.g., ethnicity, origin, gender, disability, age). The best defense against such charges is that the performance measurements are based upon a thorough job analysis, that the measures have been demonstrated to be both valid and reliable, and that the performance evaluation processes have been standardized in order to assure objectivity and unbiased application.

U.S. Law impacting discrimination		
Year	Law	Impact
1787	5 th amendment	Individuals guaranteed "due process"
1865	13 th amendment	Slavery is abolished
1866	14 th amendment	Individuals guaranteed "equal protection"
1963	Equal Pay Act	Prohibits gender-based pay discrimination
1964	Civil Rights Act	Prohibits discrimination in hiring, pay, promotion or work assignments based upon race, gender, religion, or national origin.
1967	Age Discrimination in Employment Act	Prohibits discrimination against workers over age 40
1990	Americans with Disabilities Act	Prohibits discrimination against disabled workers and job applicants; requires employers to make "reasonable accommodations"
1991	Civil Rights Act	Modifications based upon court rulings

One of the most important tasks of I/O psychologists is to select new workers from job applicants. In these hiring decisions, it is necessary to use the best predictor variables in making the decision. These are the variables that have the highest correlations with the outcome variables (criteria). One form of research is **concurrent**, and correlates the job related criteria as measured in current employees with how these subjects measure on predictor variables. A better, but more difficult technique is **predictive** validity based upon a longitudinal study; hire the applicants and then come back months or years later and measure the outcome variables.

When a predictor is not valid, it can produce errors in the form of false positives and/or false negatives. **False positives (known in I/O as false acceptances)** occur when a candidate for a job scores high on the predictor, yet turns out to perform poorly on the job. A test with many false positives does not screen out the bad candidates. **False negatives (known in I/O as false rejections)** occur when a candidate scores low on the predictor, and is labeled as lacking the traits being assessed, yet

would perform well on the job. A test with many false negatives does not give a fair chance to all applicants. This can be quite problematic if there is **adverse impact** such that women or ethnic minorities are more likely to be false negatives.

Validation of pre-employment predictors			
		Outcome variable (criterion)	
		Good worker	Bad worker
P R E D I C T O R	SCORES HIGH <i>Looks good</i>	A TRUE ACCEPTANCES	B FALSE ACCEPTANCES
	SCORES LOW <i>Looks bad</i>	C FALSE REJECTIONS	D VALID REJECTIONS

Some predictors frequently used in hiring decisions are the biodata on application forms (e.g., education, experience) and tests of **aptitude** (which measure the **potential for job-related performance**). Since IQ tests such as the WAIS are generic measures of aptitude, they should not be used to make hiring decisions. Tests of aptitude should match the job to be filled in terms of both content and format. Paper and pencil tests tend to be most valid for clerical positions. Tests with physical manipulatives (e.g., pegboards) tend to be more valid for positions involving assembly line and mechanical tasks. Managerial and sales positions might be best assessed by the type of simulations used by assessment centers.

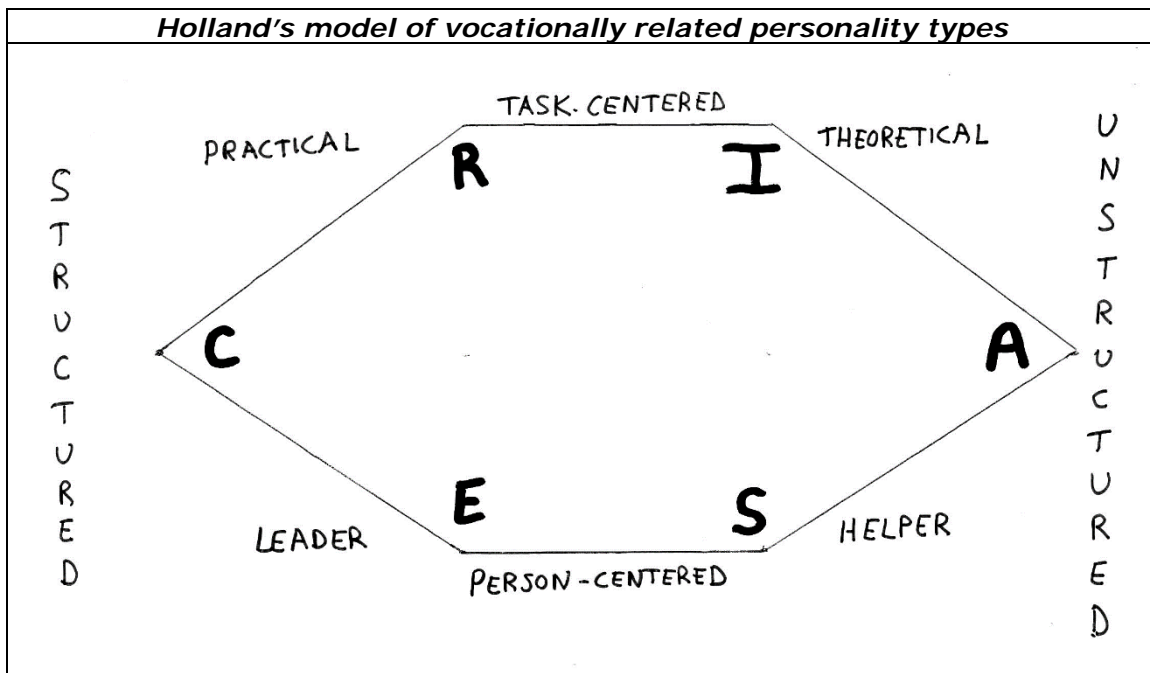
Tests of interests and personality can also be used if they are valid for the positions concerned. Some employers use more generic measures of personality such as Myers-Briggs Type Indicator, Neo 5, and 16PF. Projective tests (e.g., TAT, Rorschach) involve qualitative responses to vague stimuli and tend to have lower reliability and validity. The MMPI (Minnesota Multiphasic Personality Inventory) is a long paper and pencil test which may identify specific pathological traits associated with inappropriateness for a specific position. The Strong-Campbell, Edwards Personal Preference, and Holland Self-Directed Search are also popular. However, the best personality test for most positions is one that has been specifically developed for, and validated with, that particular position (or at least vocations in general).

John Holland categorizes people into six **vocationally related personality** types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. The Realistic types prefer to work with

things, but the Social types want to help other people. The Investigatives want to study a problem in a library or laboratory, while the Enterprising types want to lead organizational action which will solve the problems. The Conventionals want structured work environments (e.g., the post office, the assembly line), while the Artisticals want unstructured situations in which their creativity can flow.

Holland's vocationally related personality types			
	Personality	Description	Examples of occupations
R	Realistic	Hands-on, outdoors, like to work with things	Construction, mechanical, farming, mining, fishing
I	Investigative	Like to solve problems in a lab, library, or on a computer	Scientist, programmer
A	Artistic	Wants to be creative and perform for others	Musician, advertising
S	Social	Wants to help people	Teacher, social worker
E	Enterprising	Wants to lead people	Management, sales, entrepreneur, politics
C	Conventional	Wants routine and security on the job	Office work, assembly line

There are inter-correlations between these types reflecting some underlying similarities and differences.



Note: Holland's use of the letters **R, I, A, S, E, C** should not be confused with the use of the same letters by other theories of personality. For Jung, I means introvert; for Holland, investigative. For Jung, S means sensate; for Holland, socially oriented. For Jung, E means extravert; for Holland, leader like. For Friedman, A is an impatient fast tracker, for Holland, someone who prefers the unstructured environment where creative juices can flow.

Tests for honesty and integrity (e.g., the **polygraph** "lie detector") have only moderate validity, and tend to have more false positives (i.e., falsely labeling honest persons as lying) than false negatives, especially for nervous job applicants.

Interviews of candidates can be a poor selection procedure if the interviewers are untrained or inappropriately trained, resulting in low reliability, low validity, and hiring choices that reflect the bias of "like hiring like" or a **halo effect** where the interviewer focuses in on one irrelevant feature of the candidate ("we both went to the same college") and ignores the relevant details.

Case Study: Mr. N, age 24, works in the human resources department of a large corporation. His B.A. was in political science, and he never had any course in industrial psychology. He spent his first two years orienting new employees to their benefits package. He was then promoted to being an interviewer, but his training consisted only of a one-day workshop in which he was told to look for good grooming and eye contact. He has rejected several job candidates for research or production jobs, who had excellent training and prior experience just because of how they were dressed or how inarticulate they were in the interview.

Case Study: Ms. O, 53, has been the office manager for ten years. Everyone agrees that she is a great supervisor and is extremely knowledgeable about every job in the office, but she cannot understand why she has been getting such poor new hires. She begins her interviews by saying "Tell me about yourself." She does not hire the talkative candidates, thinking that they will also talk too much instead of work. That might be one helpful trait, but her technique misses so many other aptitudes and personality traits.

Neither Mr. N nor Ms. O really knows how to interview. Both end up hiring the people that they like superficially, and ignore the candidate's real abilities or constraints. The only real purpose of the interview is to see if there is a fit between this particular worker and this particular position. Instead of trying to oversell the candidate on the job, it may be wise to realistically preview the unattractive aspects of the job. Inappropriate candidates may then remove themselves from consideration by not calling back. The person finally hired will have lowered expectations about the job that will tend to inoculate against stress and dissatisfaction.

The guidelines of Equal Employment Opportunity (EEOC) are violated by hiring procedures that use race, national origin, gender, age, religion, or disability as factors. These guidelines can also be violated by adverse impact: when the results of the hiring procedures show a disproportionately low rate of persons from the protected categories. At that point, the burden of proof may be on the employer to justify the validity of predictors used. The best defense is quantifiable empirical research that establishes criterion related validity of that particular predictor with that specific job at that particular place of employment.

QUESTIONS FORBIDDEN BY FEDERAL RULES

Age

Race

Color

Religion

Nationality

Citizenship (it is OK to inquire about one's legal right to work in the U.S.)

Country of origin

First language (but it may be OK to ask which languages a person speaks)

Pregnancy status (or intention of becoming pregnant)

Military status (including membership in National Guard or Reserves)

Union membership

Physical and mental disabilities

QUESTIONS FORBIDDEN BY SOME OTHER STATE OR LOCAL RULES

Arrest records (you may inquire about convictions)

Family status (questions about dependents may be asked after hiring for purposes of determining fringe benefits)

Personal organizations to which one belongs

Sexual orientation

The process of [selection](#) involves a multiple cutoff or multiple hurdle technique that uses sequential filters to reduce the number of applicants being considered further. The best strategy is to use the most valid and cheapest measures first. Usually, this would involve beginning screen-outs by focusing on the biodata presented in the application form, then those who pass would be tested on easily administered aptitude and trait tests, and those applicants who pass would receive initial interviews from the human resources (personnel) department, then those who pass would receive some reference checks, then those who pass would be called in for a second interview, this time with a hiring authority, then those who pass might be sent to an expensive assessment center, then go through thorough background checks, then a medical exam.

Some I/O psychologists run the organization's training for new workers. Training programs must start with a needs assessment based upon job descriptions. Training deals with the actualization of aptitude through a facilitation and guidance of the learning process. The result of training will be an increase of knowledge and skills demonstrable by improved job related performance. What makes training effective would be the application of learning principles (such as classical conditioning's association of different stimuli, timely feedback, modeling through observation, shaping behaviors in small steps, and explanations so that the worker can understand what is being done and why) and also mnemonic principles of visual (eidetic) images, conceptual memory, and muscular practice (kinesthetic). I/O psychologists can do formal experiments on training to determine if one type is better than another.

Experimental research on training			
		<i>Outcome variable (criterion)</i>	
		<i>HIGH PRODUCTION</i>	<i>LOW PRODUCTION</i>
I N D E P E N D E N T	Training	A	B
	No training	C	D

Some I/O psychologists run the company's orientation program. Orientation (indoctrination) is the systematic exposure of the new worker to the organization's values and procedures. An experiment on different orientation procedures might look at a dependent variable such as turnover.

Experimental research on orientation			
		Outcome variable (criterion)	
		Follow up after one year	
		With company	Quit or fired
I N D E P E N D E N T	Orientation	A	B
	No orientation	C	D

Job satisfaction is an outcome variable (which may be relevant in that it can reduce absenteeism and turnover). Global assessment of satisfaction looks at overall levels without breaking it down into separate components. Facet measurement concerns the measurement of the individual components of job satisfaction (e.g., wages, benefits, supervision, physical working conditions, relations with co-workers). The norms for both global and facet job satisfaction are high: 80 - 90 percent of all workers like their jobs. **Herzberg** has argued that satisfaction and dissatisfaction should be viewed as separate variables, and that some facets (e.g., intrinsic nature of work) lead to job satisfaction while others (e.g., supervision, working conditions, salary, benefits) lead to job dissatisfaction. Different facets may have different levels of importance for different workers, depending upon gender, age, and personality. Flextime and job enlargement (also known as job enrichment, an attempt to provide varied tasks) may be appreciated by some workers, but not others.

MacGregor suggested two types of management styles, and these reflect the two basic approaches to motivational theory. **Theory X** assumes that **workers are lazy** and need to be externally motivated in order to work. Examples of this approach begin with "**Scientific Management**" at the turn of the century under F.W. **Taylor**, who wanted to use fear and greed (higher pay) to get workers to work more efficiently. Skinner's perspective on operant conditioning applies, showing that reinforcement schedules can be manipulated to get more output through piecework and gainsharing. Newer cognitive theories of learning show the importance of expectance (e.g., Porter-Lawler, self-efficacy) in which workers must believe in the connection between their efforts and their rewards. Another cognitive theory is that of equity: if workers perceive that they are being treated unjustly, they may reduce their efforts or honesty.

Theory Y assumes that **workers are essentially good** people, and just need to be treated decently. This approach began with **Mayo's** research at Hawthorne where he found that workers responded favorably to extra attention and group incentives. In later studies, Mayo also noticed that informal groups of workers could also restrict production by establishing norms. **Lewin** pointed out the importance of industrial democracy: workers will improve output and safety procedures if they, as a group, have some input into the decision. **Maslow's** hierarchy of motives says that the lower, physiological, needs have priority, and must be satisfied first. The implication for management is that workers first desire a living wage before considering safety, social interaction, esteem, or self-actualization. As each need is met, the next comes to the fore as the one that is the main motivation.

1	2	3	1	5	9
4	5	6	2	6	10
7	8	9	3	7	YES
YES	0	NO	4	8	NO

*Which of these two keypad designs for data entry would be most efficient?
Only an experiment can find out.*

Human factors engineering is a branch of I/O also known as **ergonomics** and deals with the **physical work environment**. The founders of Scientific Management, Taylor and the **Gilbreths**, emphasized finding the most efficient arrangement of tasks and tools and motions. Safety concerns indicate that while digital displays are best for precise measurement of complex information, analog displays are best for monitoring, and auditory displays (e.g., buzzers) combined with flashing lights might be best for warnings of danger (recall from chapter 5 that permanent hearing loss might be caused by prolonged exposure to over 90 decibels). Tactile coding of controls also prevents errors. Safety procedures are more effective when they are not contradicted by demands for output or informal group norms. Occupational Safety and Health Act (OSHA) contains specific federal guidelines for a safe work environment. Accident proneness is a personality trait in which persons pay insufficient attention to environmental cues of danger.

<i>Advantages of different information displays</i>			
Format	Degree of precision	Ease of monitoring	Effectiveness of warning
<i>Digital</i>	Excellent	Fair	Poor
<i>Analog</i>	Good	Excellent	Good
<i>Buzzer and flashing light</i>	Poor	Fair	Excellent

Burnout is an emotional alienation and exhaustion often attributed to prolonged exposure to job related stress or dissatisfaction. The worker may become frustrated and emotionally disengaged. Aggression and psychosomatic illness are also possible outcomes. Certain careers are considered especially vulnerable for burnout (e.g., emergency services, social work, high school teaching). Police departments which deal with high crime rates and law suits against the police have high rates of burnout, resulting in a high turnover of officers. The individuals most prone to burnout are those who are most prone to be frustrated by the job. Frequently, this would be people who went into the field (e.g., law enforcement, teaching, or social work) because they wanted to help other people, and what they find most frustrating is not the quantity of the workload, but the lack of making a real impact on other people's lives. One of the best lines of defense in preventing burnout in the public sector would be good managers and supervisors who shield their subordinates from unnecessary frustration, and maximize the more fulfilling aspects of the job.

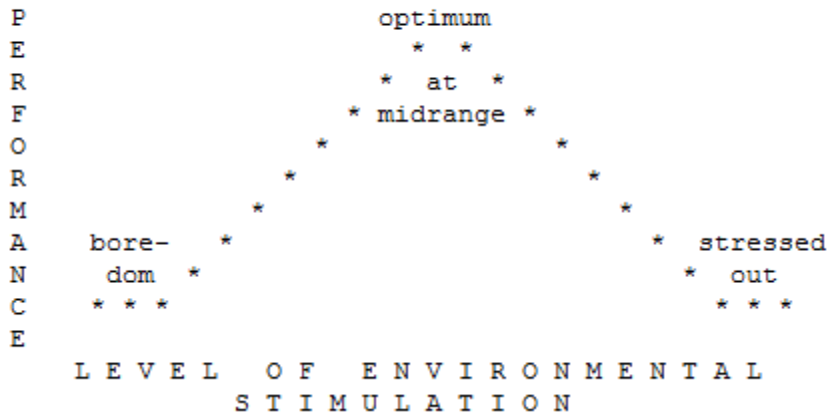
Case Study: Mr. J, now 34, always wanted to be a policeman. When he turned 21, he started with a local Nebraska department. His performance evaluations and job satisfaction were high. At thirty he married and moved to California to help his wife's career. He got a good salary and a promotion at a large metropolitan force, but he found the stress overwhelming. In his new position, it was not so much the stress of the direct interaction with the criminals, but his inability to steer around the bureaucracy. After two frustrating years, he resigned and found a position with a lower rank at a smaller department. His job satisfaction went way up.

Burnout can be prevented and ameliorated in several ways. One is by using realistic job previews as a selection technique. In other words, tell applicants all the bad things about the position. Some applicants will then withdraw their candidacy: that is what we want, removing a future burnout before the organization invests time and money in training. Those who persist through the job application process are now inoculated, and will not be measuring the everyday job frustrations against idyllic standards of what the job entails. Therefore, realistic job previews reduce early turnover.

In dealing with workers subjected to highly stressful situations, the good manager attempts to be as supportive as possible. One important aspect of this is to shield the individual front line worker from bureaucratic hassles. Another strategy is to give the individual worker as much control as possible over her own job flow, so that she can self-regulate the incoming stress. The last resort is to build emotional support for burnt out workers by creating empathic teams and also be being there as an individual when needed.

The assumption that excessive stress is the primary cause of burnout can be traced to the **Yerkes-Dodson law**, which holds that there is an **optimum level of environmental stimulation**: below that point, workers get bored and performance declines, and above that point, workers get overly stressed and performance declines.

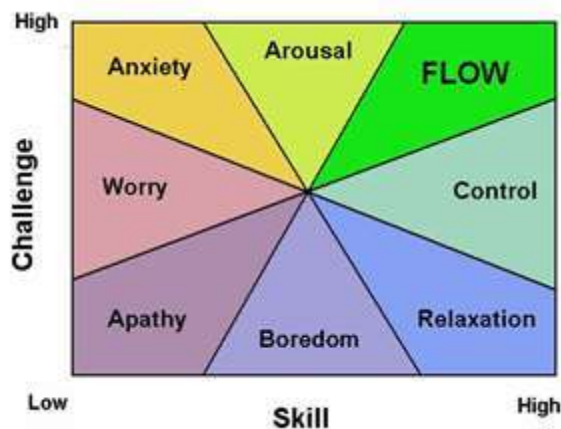
Yerkes-Dodson Law: optimal performance occurs at moderate levels of stimulation



Some industrial psychologists view stress and boredom, not as opposite ends of the same continuum, but as two distinct and undesirable workplace conditions. A given job can be stressful, or boring, or both, or neither. Some jobs (e.g., tending a slow paced station on the assembly line) are low stress, high boredom, while other jobs (e.g., emergency medical services) are definitely high stress and low boredom. However, a job can avoid both stress and boredom, as is known by those professionals have managed to build a practice with their preferred clientele and those university professors and researchers who work in supportive environments with few deadlines. Unfortunately, some jobs can be both stressful and boring (e.g., tending a fast paced station on an assembly line, military on full alert). In selecting a career or a position, an individual worker must decide how much of a priority it is for him to avoid stress, and to avoid boredom.

Relationship between stress and boredom			
		<i>Stress level</i>	
		High	Low
B O R E D O M	High	Military on alert Fast assembly line or office work	Military at peacetime Slow assembly line or office work
	Low	Military in combat Emergency services	Private Practice Research

Another way of looking at work-related challenges is suggested by **Csikszentmihalyi's** concept of **flow**: the idea that the optimum experience is when the challenges of work are matched to the individual's full abilities.



Different organizations have different cultures that determine how they make decisions, what kind of people they hire, and what kinds of people they retain. Max Weber found that older, larger organizations tend to become bureaucracies with well-defined authority and strict rules. The power of managers in bureaucracies is "legitimate" in that it comes from their role within the organization rather than from their own personal characteristics (e.g., charismatic), as is the case in smaller organizations. Some managers exercise coercive power (punishments and threats) while others exercise reward power.

Some organizations have a culture in which they promote from within. This tends to reinforce the corporate culture, but it can also lead to promotion being a reward for behavior in one's current position. The problem with that is that if the positions require different kinds of skills (e.g., sales manager vs. sales representative), then success in a previous position is no guarantee of success at the promoted position. Such organizations run the risk of the Peter Principle: promoting individuals level by level until they reach a level at which they are incompetent, and there they remain.

QUESTION #14.3: What are the career opportunities in psychology?

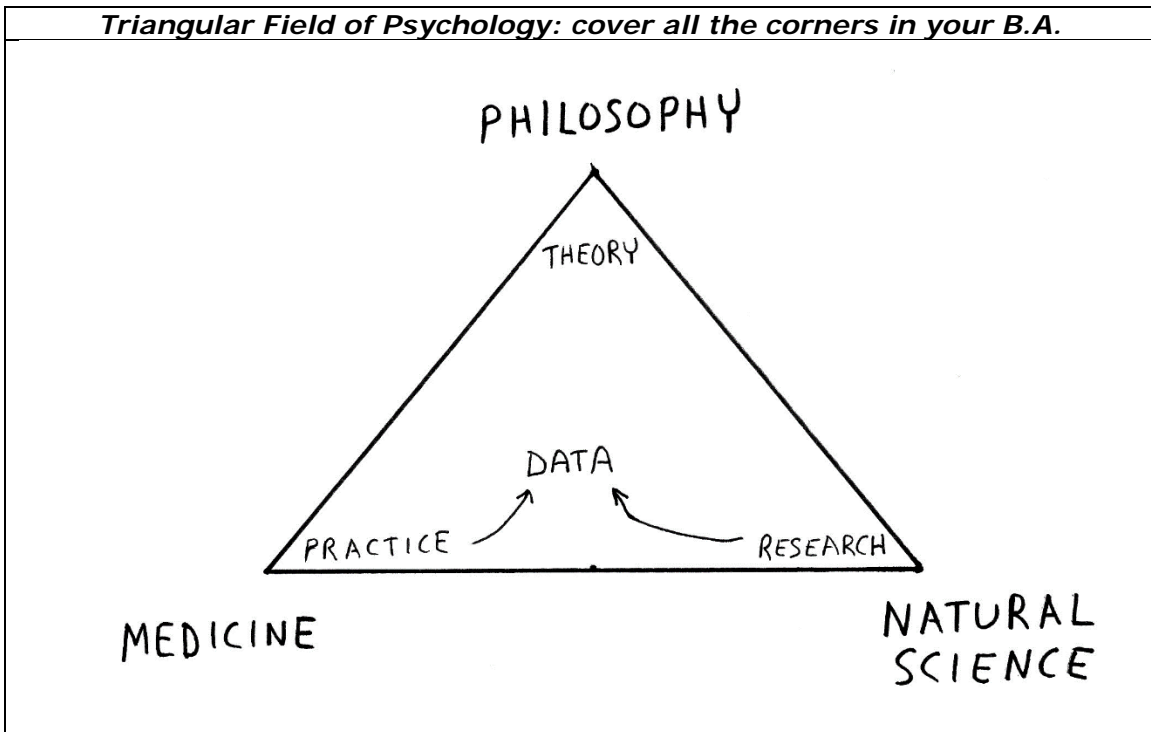
Most of the future opportunities, and the **best pay**, will be in the **applied fields, especially I/O and consumer behavior**. Depending upon how the nation and the states work out a strategy for health care, there could be a large demand for clinical psychologists (if optimal mental health care is funded) or very little demand for clinical psychologists (if governments and private health care providers decide to cut costs by providing cheap medication regardless of effectiveness or diagnosis).

Case Study: During the late 1970s, Argentina was having an economic crisis of massive inflation. The military overthrew the *Peronist* government and made some simplistic choices about the nation's priorities. Military spending had the highest priority (as the generals prepared for an invasion of the Falkland Islands). Mental health care had the lowest priority. *Hospital Borda*, one of the largest in the world, had very few psychologists or social workers to provide a thorough diagnosis of the patients, or perform any kind of psychotherapy, let alone therapeutic activities during the day. The patients just sat around all day on their filthy beds. Security was inadequate, and patients frequently escaped. The staff did not mind, figuring extra space was needed, and if the patients could make it on their own on the outside, maybe they were not so bad off to begin with. The military dictatorship determined that the cheapest treatment was medication, and that it would be cheaper to have all the patients take the same medication (in this case, generic haloperidol). While this might be a good prescription for most schizophrenics, as well as some bipolars and dementia patients, it would be the wrong medication for depressed patients. Furthermore, the medication supply frequently ran out toward the end of the month, and the medical staff hastily made up some placebos, noting which patients did alright on the placebos, so that next month the real medicine could be saved for the patients who really needed it. The long term impact on clinical psychology in Argentina has been great. Enrollments in such programs went way down, and became almost entirely female. (The men figure that they should study engineering or business because they will have to support a family some day and need to get into a field where there are jobs at the end of the line.)

In most foreign countries, 18 year olds right out of preparatory (high school) choose their careers when they enter the university, going directly into a specific professional school: medicine, law, engineering, dentistry, psychology, etc. In Mexico, psychology is a five-year program leading to a degree known as a *Licenciatura*. When the student graduates, she is a licensed clinical psychologist (or some other specialty). The educational program is more compressed: no electives, no general education. Psychologists only get the math that they will need to interpret psychological tests (statistics) while the civil engineers will study calculus. The advantage of this educational strategy is that one spends fewer years in school before getting into a profession. The disadvantage is that one has to make an almost irreversible decision at age 18.

The U.S. higher educational system is more drawn out, but it gives many opportunities to change one's direction, stop out and restart at almost any point. The best strategy is to start with general education courses, then select a major. Some professions (e.g., engineering, nursing, architecture) may require certain specific courses to be taken in the first year or two of college, but this is not the case with other professions (e.g., psychology, law, business). With psychology, there are not many career opportunities at the A.A. level, or even at the B.A. level. It is best to get a well rounded major which covers each of the three corners of the psychology field: theory, research and practice. That means taking at least one course in history and systems (theoretical models), some practical experience (even as a volunteer),

two courses in statistics, and several in research methods (and try to be involved with several research projects).



Career path for clinical psychology			
Level	Where	Study	Outcome
Lower division	Community college	General education	Get transferable credits or A.A.
Volunteer	Agency	Internship	Get experience
Upper division	U.C. system, Cal State, Private university	Major in psychology	Get B.A. or B.S.
MAKE CAREER DECISION			
Graduate	U.C. system, Private university, Free-standing graduate school	Specialized program	Master's or doctoral degree
Post-doctoral	Agency such as V.A. or state hospital	Internship	Get experience
Licensing	State agency	Take exam	Get license

The decision of which branch to specialize in must be made at the point of selecting a graduate program. It is a very bad strategy to get a graduate degree in one area of psychology, and then try to work in another. If you want to work with patients, get a degree in **clinical**, look for an APA approved doctoral (e.g., Ph.D., Ed.D., Psy.D.) program in clinical psychology. If you want to be a California marriage counselor, look for a master's program approved for that license by the Board of Behavioral Science Examiners.

There are other career paths within the human services, such as nursing, social work, or psychiatry. Psychiatrists in private practice or working for hospitals will usually earn more than psychologists (but maybe not as much as other physicians, such as surgeons).

<i>Career path for a psychiatrist</i>			
Level	Where	Study	Outcome
Lower division	Community college	General education	Get transferable credits or A.A.
Volunteer	Agency	Internship	Get experience
Upper division	U.C. system, Cal State, Private university	Major in chemistry, biology, or neuroscience	Get B.A. or B.S.
<i>MAKE CAREER DECISION</i>			
Graduate	U.C. system, Private university, Free-standing medical school	Specialized program	M.D. or D.O.
<i>DECIDE MEDICAL SPECIALTY</i>			
Post-doctoral	Agency such as V.A. or state hospital	Internship & Residency	Get experience
Licensing	State agency	Take exam	Get license and board certification

Social workers usually do not earn as much as psychologists or registered nurses.

<i>Career path for a social worker</i>			
Level	Where	Study	Outcome
Lower division	Community college	General education	Get transferable credits or A.A.
Volunteer	Agency	Internship	Get experience
Upper division	U.C. system, Cal State, Private university	Major in psychology, sociology or social work	Get B.A. or B.S.W.
<i>MAKE CAREER DECISION</i>			
Graduate	U.C. system, Cal State, Private university	Specialized program	M.S.W. or D.S.W.
Post-degree	Agency such as V.A. or state hospital	Internship	Get experience
Licensing	State agency	Take exam	Get license

Compared to many other human service professions, nursing gives more career and educational options in terms of levels and specializations.

Career path for a nurse			
Level	Where	Study	Outcome
Lower division	Community college	Pre-requisites	Get transferable credits
Volunteer	Agency	Internship	Get experience
Lower or upper division	Community college or C.S.U. or Private University	Major in nursing	Get A.S.N. or B.S.N.
Licensing	State agency	Take test	Get license
Work	Hospital, clinic, or agency	Paid employment	Get experience
MAKE DECISION TO GO BACK			
Upper division	C.S.U. or U.C. Private University	Major in nursing	Get B.S.N. or B.A. in other field
MAKE DECISION TO GO BACK			
Graduate	U.C. system, Cal State, Private university	Specialized program	M.S.N. or masters in other field
MAKE DECISION TO GO BACK			
Graduate	U.C. system, Private University	Specialized Program	D.S.N. or doctoral in other field

There are many new emerging fields within psychology (e.g., sport psychology) or related to psychology (e.g., gender studies), but it is not always clear what the career path is going to be for persons who get an advanced degree in those fields. For example, many students have earned master's or doctoral degrees in **gerontology**, under the assumption that the growing aging population will guarantee a demand for such specialists. However, never assume that real human needs translate into government decisions about funding priorities. In the field of gerontology, for example, when most Veterans Administration Hospitals and other government agencies hire people to work with the aged, what they are looking for is specific qualifications that match careers such as physician, clinical psychologist, social worker or nurse. Someone with a gerontology degree may not fit either the job description or the job specification.

Careers in the human services			
Career	Degree needed	Pay	Job market
Psychiatric technician	Certificate	\$	Fair
Psychiatric Nurse	A.S.N.	\$\$\$	Good
Psychiatrist	M.D.+	\$\$\$\$	Good
Psychoanalyst	M.D. / Ph.D. ++	\$\$\$\$	Poor
Social worker	B.S.W.	\$\$	Fair
Marriage counselor	M.A.+	\$\$	Fair
School psychologist	M.A.	\$\$\$	Fair
Clinical psychologist	Ph.D.+	\$\$\$	Good
Industrial psychologist	M.A.	\$\$\$\$	Excellent
Consumer psychologist	Ph.D.	\$\$\$\$	Excellent
Sport psychologist	Ph.D.	?	?
Research psychologist	Ph.D.	\$\$\$	Fair