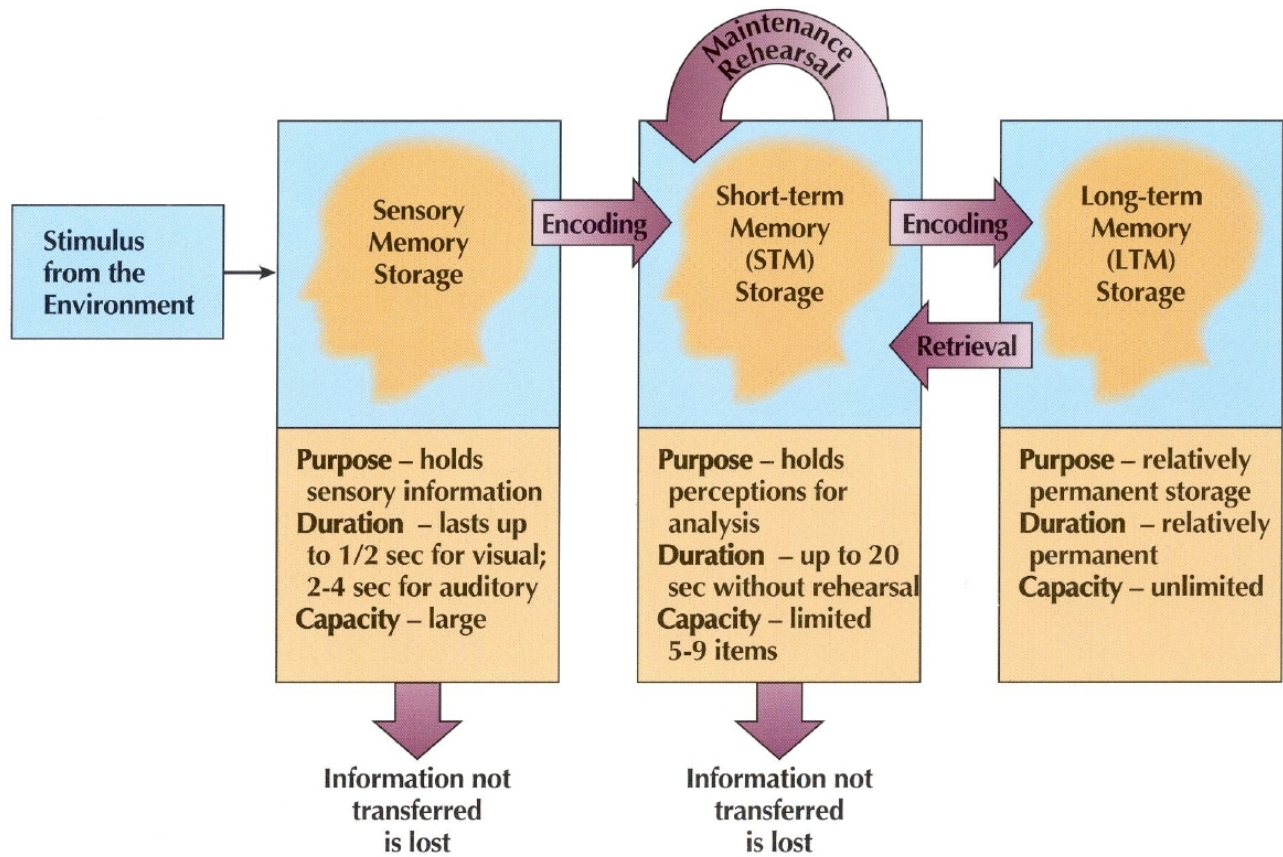# Introductory Psychology – Unit 2

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Cuyamaca College

Memory

Retention - <u>Types of Memory Storage</u>: There are three levels of memory storage, each with unique characteristics.

  Sensory Registers: Information from all sense modalities enters into this initial level of storage. A great deal of information can be stored, but it decays rapidly. For most sense modalities information is retained for approximately one half of a second. Think of this like a series of frames, like a movie. The transition is fast enough that we perceive a fluid, ever changing reality. The term *iconic storage* specifically refers to visual information, *echoic storage* to auditory information. These two have been studied the most.
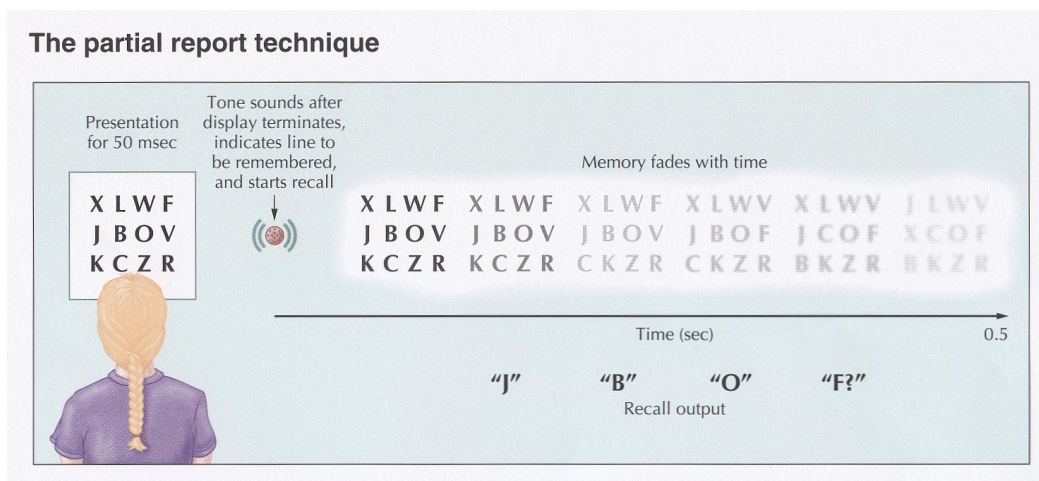

The *partial-report* procedure (<u>Sperling, 1960</u>) demonstrated the relatively large capacity, but short duration of information in the iconic register. A matrix of three rows of four letters is briefly flashed (0.05s), and then one of three tones is sounded after stimulus termination. Each tone is associated with one of the rows, and the subject is to recite the letters that appeared in the designated row. As long as the tone sounded within one half

of a second after stimulus termination the subjects performed quite well. This indicates all twelve letters were in iconic storage, and attention could be directed to any row for recitation, for approximately one half of a second. Ultimately new information constantly enters the iconic register replacing old information almost immediately. Only that which is specifically attended to is then transferred into short-term memory.

   Echoic storage differs from the other modality specific sensory registers in that its duration is longer. These echoes persist for a number of seconds. This is necessary because of the linear nature of auditory information. One must be able to retain several seconds worth of auditory information in order to grasp the meaning of a sentence, or pick up on a melody.

   Actually, across all the sensory registers the information processing is aimed at extracting meaning. Meaningful stimuli capture our attention, even if we were not previously paying attention to the source. For example, we immediately focus in on the tactile sensation of a mosquito biting us. Another example, when multiple conversations are going on at once we attend to the one we are engaged in, but hearing your name mentioned elsewhere generally shifts one's attention to the conversation that is the source (cocktail party effect).
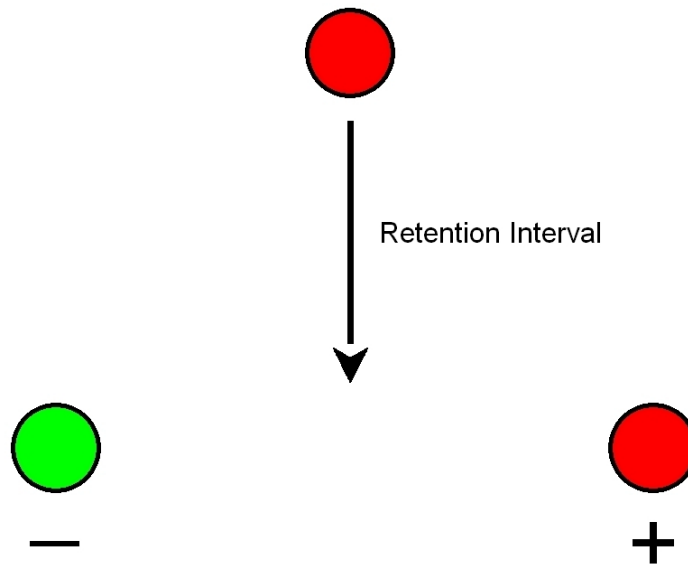
   Short-Term Memory: The information we attend to from the sensory registers enters into short-term memory. Without rehearsal the information in short-term memory steadily decays. After approximately 20 seconds the information is lost. So the information in short-term memory must either be rehearsed more extensively and then passed on to some level of long term storage (via the _hippocampus_) or it will dissipate into oblivion.

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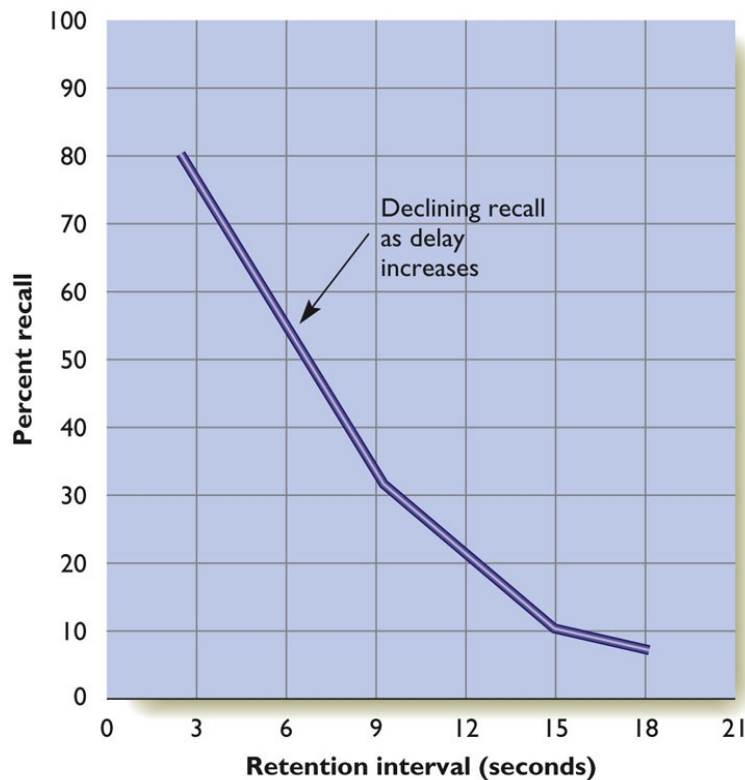
   The _Delayed Matching To Sample_ procedure has been used to assess the short-term memory span of other creatures (and pre-linguistic humans). A sample stimulus (such as a red light) is presented for a limited time. Then there is a delay period (that is systematically varied). Finally, there is a choice phase in which the subject must choose between two alternatives, one associated with the sample while the other is not. The subject must match (choose the alternative associated with the sample) to receive reinforcement. Thus, if choosing between a red and a green light, picking the red one constitutes a match. It's assumed that animals don't have any linguistic or other capacity to allow them to rehearse, so the maximum length of delay reflects the short-term memory span. This also would reflect the window of 'conscious' experience, or present reality of the subject. And just as with adult humans prevented from rehearsing material, the maximum delay is around 20 seconds across a wide range of species (pigeons, chickens, rats, dogs, monkeys, etc.). In all these cases the performance levels are far above chance for delays less than 20 seconds, and rapidly fall to chance levels once the delays

extend beyond 20 seconds (except in very special circumstances which may evoke a sort of rehearsal mechanism).

Delayed Matching to Sample


Retention Interval

−   +

It is also the case that material from long-term storage must be moved back into short-term memory in order to be accessed (and then experienced, manipulated, or compared to new information). This *working memory* is where the information we are thinking about or are aware of at any given moment is held. So whatever we're thinking about, whether it's something that's just caught our attention, something we're trying to retain, or something we've retrieved from our store of long-term memories enters into working memory. So this really entails our *current conscious experience or present reality*. It represents a 20 second window on the world. And we seem to share this 20 second window with a host of other species.

The capacity of short-term memory is limited to approximately five to nine items (Miller's seven plus or minus two). Additional items will replace items already in short-term memory. This relates to why license plates and local phone numbers are kept at seven characters. However, *chunking* can be used to keep more information in short-term memory. It works by using information in long term storage to organize and reduce the necessary number of units, so more can be held in short term storage. In other words, if taken together some of the elements you're trying to remember are somehow meaningful to you then that information may comprise just one of the short-term memory items. So while you may only be able to remember around seven arbitrary digits, you may be able to remember quite a few more if there is a familiar sequence within the set.


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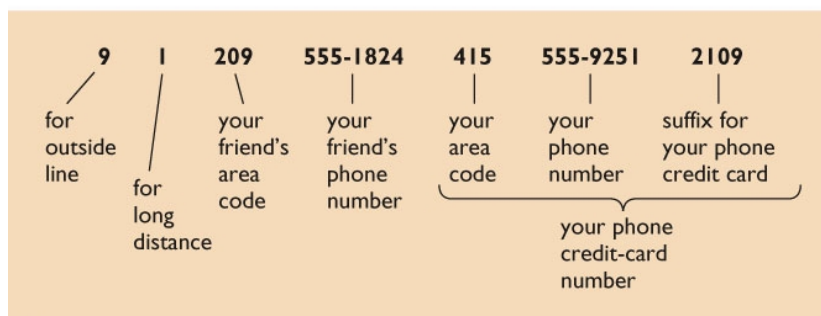
Long-Term Memory: The capacity appears to be unlimited, and the duration relatively permanent. These are the memories we carry for a lifetime. These vary in form from memories of specific events, of stories, of faces, of facts and figures, of how to perform various tasks, and of learned associations. Of course, there is some loss of information. However, that may be tied to the initial period of storage. How much one retains may be affected by how well the material was learned initially as well as how often it is subsequently assessed. Beyond that, the general consensus is that we don't forget things once they are established in long-term memory. So we retain all our memories for life (barring brain trauma). The problem is that we are simply unable to retrieve certain memories.

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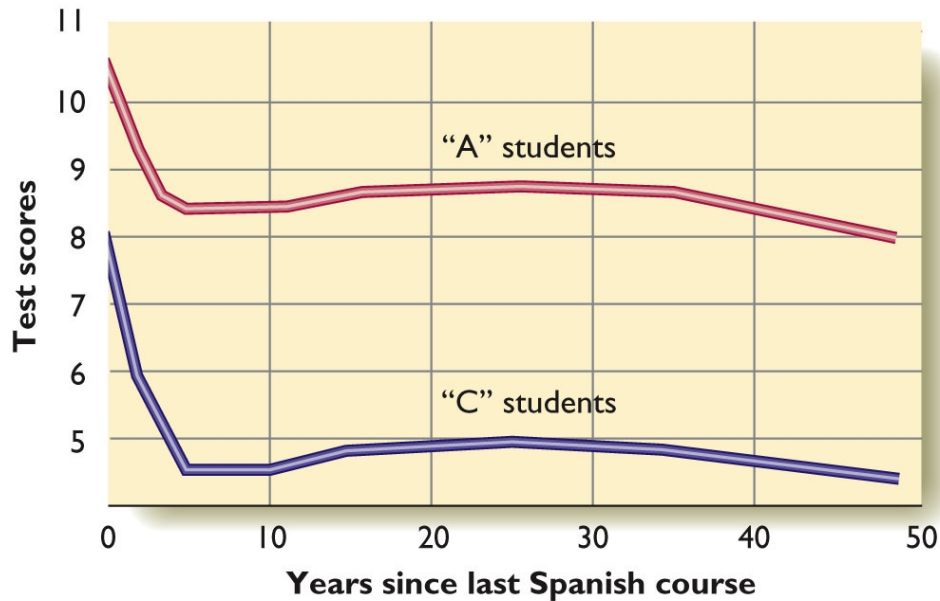
Types of Memories Stored: The types of memories we retain fall into specific categories.

   Episodic Memories: Memories for events, scenes. These are like movies we carry around with us, but they may carry visual, auditory, olfactory, gustatory, and other sensory information. They are vivid and lucid, allowing us to replay events that we have witnessed. The best memories of this type usually involve important, unique, and often life-changing events. Novelty and emotional content play key roles in the retention of these memories. So we remember first instances better than subsequent similar experiences. And we remember experiences that generated strong emotional reactions.

   However, there is also evidence that in other cases we often do not retain a lot of specific details. Instead we make assumptions about what would be appropriate and use these to fill in the blanks, a process known as confabulation. This depends on the event, some being more open to modification than others. And the process of remembering itself, taking into new events and history since last recall, may alter our memories. The reason for this has to do with a changing framework from which we access our memories. Finally, research on eyewitness testimony (Loftus) indicates many of our long-term memories may be quite inaccurate. In some cases we can be lead to 'remember' things that did not even occur.

   Faces: Research done with human infants as well as other primates indicates an affinity for identifying and remembering faces. Babies are more responsive to human faces than other stimuli, particularly their mother's face. There's evidence that an area of the temporal lobe may be devoted specifically to facial recognition.

   Semantic Memories: Facts and figures remembered. We retain meaning, but without context. And so most of us know two plus two equals four, but have no recollection of when and where (the situation) we acquired this knowledge.

   Procedural Memory: We remember how to do things. These memories are developed through training. Once they are well established procedural memories allow us to perform almost automatically, with minimal attention required. And so we can drive a car, ride a bicycle, or type with ease. Most procedural memories are linked to motor skills. But other skills also fall under this category. Games are such an example. Once we develop a certain proficiency at a particular game we can readily perform at that level. And research has shown that people can quickly regain their previous level of performance even years since last playing a particular game, providing the game is not overly demanding physically. Abilities such as being able to quickly scan a complicated journal article, or an elaborate blueprint, and extract the most important or pertinent information

are also forms of procedural memory.

Learned Associations: We retain what we have learned through the process of classical conditioning. As a result we respond to the temporal and spatial cues and signals in the environment that we've learned over the course of our lives. Because elicited responses are fairly automatic we don't think that much about them, and don't commonly regard them as a type of memory. However, we retain them and respond to them throughout our lives. Another unique aspect of these memories is that they appear to be stored in the cerebellum rather than the cortex. This is generally considered a more primitive part of the brain and it may be that remembering this type of association is somehow more basic to survival.

The associations between behaviors and their consequences learned through instrumental conditioning are usually retained as part of either our episodic, semantic, or procedural memory. So these associations seem to be tied to some of the higher levels of memory, and they themselves may represent a more advanced kind of learning. In other words, the capacity to recognize and remember causal relationships may require a more developed cortex.

Priming: We form associations between concepts and memories. Thus, thinking about one thing may give rise to thoughts and memories of related things. Priming also plays a role in procedural memory, engaging in one part of a procedure triggers the memory for the whole procedure. So when we climb on a bike all the necessary procedural memories are primed: keeping balance, pedaling, steering, and so forth.
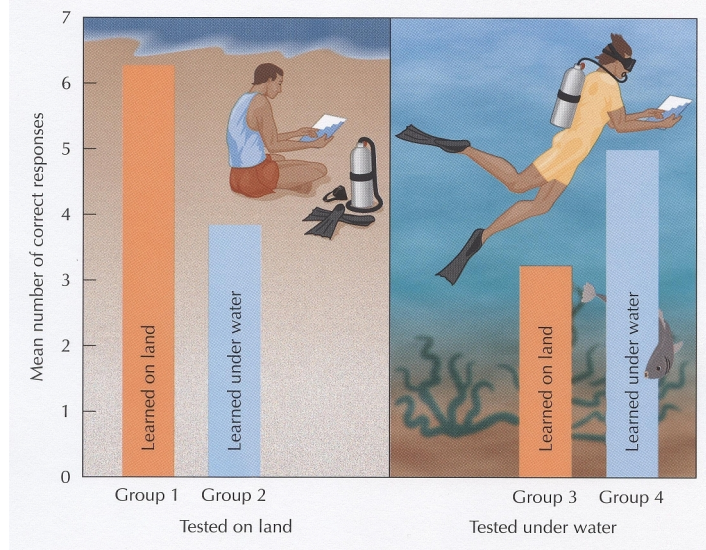
Memory Acquisition:

The Learning Curve: Given some quantity of material, the most learning takes place upon initial exposure, with incrementally smaller gains thereafter until complete mastery. For example, with a list of 10 words we may quickly commit to memory seven of them after just one or two rehearsals. It may then take a number of additional rehearsals before all ten are committed to memory. So the main body of information is acquired rather quickly, with a good deal of additional time and energy needed to acquire a complete and detailed representation in memory. This makes sense when we consider that we have the most to learn initially, and often it's unnecessary to remember every single piece of information. For example, upon an initial encounter we quickly learn that a polar bear is a large, white, and surprisingly fast predator with formidable teeth and claws. The fact that polar bears have webbing between their toes to aid in swimming is another unique feature we could learn with additional study, but unnecessary for identifying and avoiding them in the future.   Note that in so far as forgetting is concerned the pattern is reversed, we may quickly forget a few details but retain the majority of information for a considerable time.

Primacy and Recency Effects: When material is presented in some ordered fashion, such as a list of words, the first and last items are more readily retained in memory. It takes a number of additional trials to commit to memory those items in the middle. The advantage found for the first items is termed the *primacy effect*. These items are encountered before any others so there is nothing to block rehearsal or otherwise adversely affect retention, and they may be rehearsed while additional items are presented. The advantage found for the last items is termed the *recency effect*. These items are encountered last so there are no further items to block rehearsal or otherwise adversely affect retention between learning and testing. Retention and rehearsal of both the first and last items serve to block rehearsal of the middle items. So it is only after the first and last items are committed to longer-term storage that full attentional resources can be brought to the task of rehearsing and acquiring these middle items.

Encoding Specificity: We tend to categorize information. The initial associations we make when first remembering an item affect how that information is subsequently accessed. For instance, if a particular word has multiple meanings then the meaning we're thinking of while trying to remember it (and related concepts) serve as a cue to later recall.

State Dependent and Location Specific Learning: This phenomenon is related to the idea of encoding specificity. During acquisition and the early phases of retention various *cues* can play an important role in the consolidation of memories. These cues can be tied to different bodily states, such as when one is alert, fatigued, or hungry. Also the presence or absence of caffeine, nicotine, alcohol or other substances may also become associated with the material or events to be remembered. The best situation for subsequently accessing these memories is to recreate the same bodily state that existed during acquisition. The same holds for location, unique cues in the environment where acquisition took place may serve to facilitate access to the material. Thus, it is best to study and test in the same location if possible.

Context effects in remembering

Mean number of correct responses (y-axis, 0 to 7)

Learned on land | Learned under water
Group 1 | Group 2
Tested on land

Learned on land | Learned under water
Group 3 | Group 4
Tested under water

Note that if one wants to fully retain information such that it is always accessible, then one may want to study under a number of conditions and in a number of locations so the information is not particularly cue dependent. How often do you get to take exams in your living room where you did most of your studying, much less while smoking and having cocktails? Also, makeup exams and so forth seldom occur in the original classrooms, nor do generalized tests such as the SATs or GREs.

Mnemonic Devices: One device is chunking information based on pre-existing material stored in long-term memory. This can occur fairly automatically as one stores items in short term memory, but one can also systematically use this method to categorize material to be retained in long-term memory. Another device is the use of acronyms, short words or phrases that stand for larger bodies of information. Examples include the ABC's of learning (Antecedent, Behavior, Consequence) and ROYGBIV (Red, Orange, Yellow, Green, Blue, Indigo, and Violet) referring to colors of the visible spectrum by descending wavelength. A final example is the classic method of loci. One imagines traveling about a well known location such as one's home. Then one associates various items to be remembered to specific points or objects in that location. It is important to note that novelty and oddity can enhance later access and retrieval. So when trying to remember a list of groceries put the Pop Tarts in the DVD player, not the toaster. There are a number of other such devices as well.
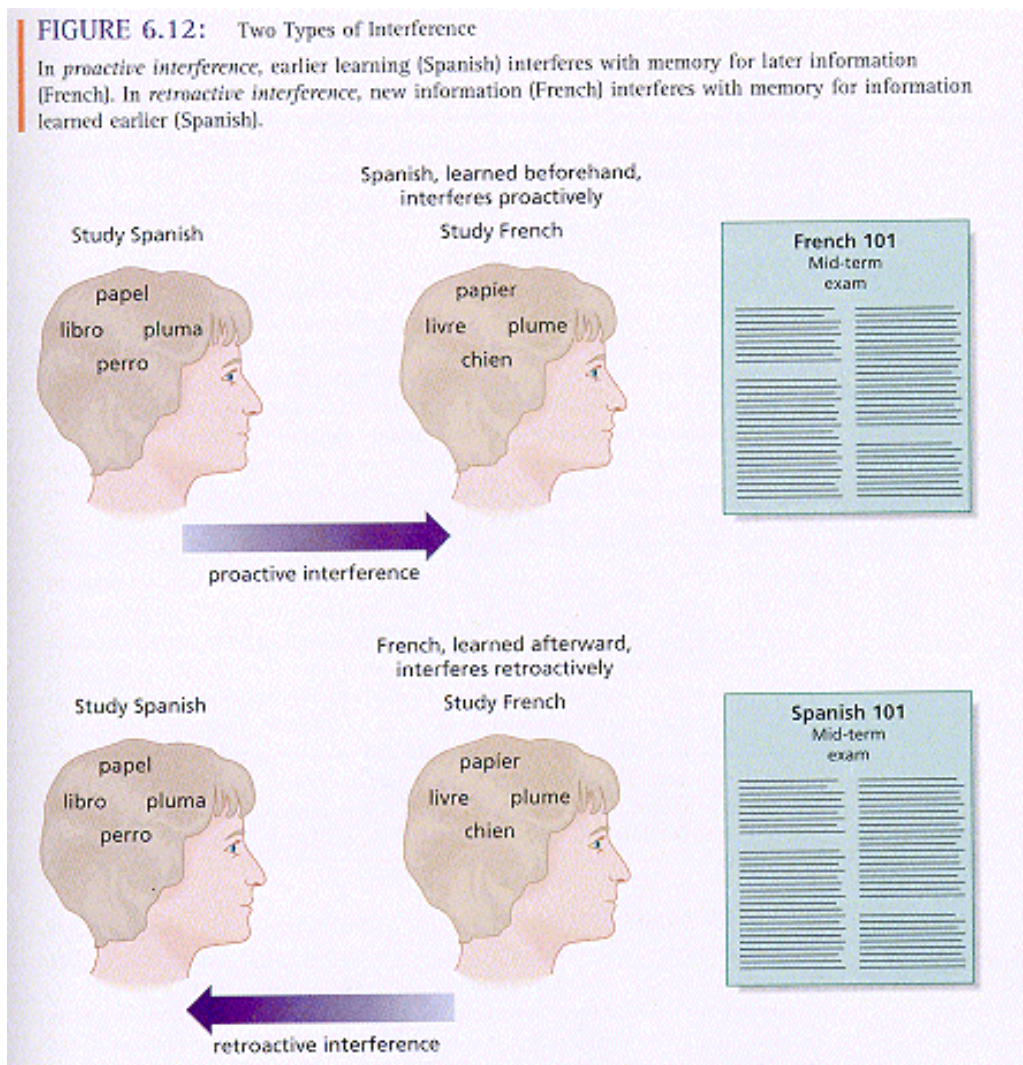
Massed versus Distributed Practice: In general, it is not advisable to study for long periods without rest. It is better to break up one's studying, even if this means less time spent in the actual act of studying. This is the difference between massed versus distributed practice. There are two reasons for this. One is fatigue. Over the course of a massed study session one tires, attentional resources are strained, and concentration is reduced and the result is inefficiency. The other reason has to do with one's ability to tie new information to material already in long term storage. During breaks the new material to be remembered can be compared to that which has already been learned. The result may be the realization that the new material fits in with some pre-existing category, or is an example of some already understood concept, or is a concept that ties together a number of previously remembered examples. Any of these possibilities can serve to enhance the processes of acquisition and retention, but these relationships are seldom discovered while actively rehearsing material. So one needs to take breaks to allow the mind to make these kinds of associations.

Summary - The Best Overall Plan to Maximize Acquisition and Retention. By combining the various findings one can ascertain the best plan for studying and to maximize one's acquisition and retention of new material. First, organize the material. If possible arrange the material hierarchically from most to least important. Initially work only with the material that is most important to take advantage of the learning curve. In later study sessions work with all the material, but begin and end each session with a review of the most important material, to take advantage of the primacy and recency effects. To avoid the over dependence on cues found with state dependent and location specific learning study under a variety of both bodily and environmental conditions, at different times of the day, and in different locations. Use mnemonic devices when applicable, preferably employing novelty and unique associations. And plan ahead so that all the material doesn't have to be acquired in a limited time frame. Distribute studying over several sessions spanning a number of days if

possible. Even during study sessions remember to take frequent breaks. Both of these will take advantage of the benefits provided by distributed practice.

Memory Retention is Indexed by Recall, Recognition, and Savings. The first two are commonly encountered in testing situations. *Recall* is the ability to produce information in response to a question (minimal cueing). One has to come up with the required information pretty much on one's own. Examples are fill in the blank questions and essay questions or assignments. *Recognition* is the ability to correctly choose from a number of alternatives, such as in multiple-choice questions (and to a lesser extent true/false questions). Measures of *savings* are used more often in long term studies of memory (*e.g.* Ebbinghaus during the 19th C.). There are two phases. In the first phase new material is learned, such as a list of nonsense syllables, to some criterion level based on recall or recognition testing. Then a delay period follows with no rehearsal of the material (anywhere from a few hours to several years). The second phase consists of relearning the same material to the same criterion level, with the relearning typically taking less time or fewer trials than the original learning. The difference between either the time or the number of trials needed to reach criterion between the original learning and the relearning of the material is the savings measure. It is believed to reflect how much material was retained in memory over the delay.

   Also of note is that the capacity to recall also depends on the type of memory. In general, episodic memories are more fragile than other forms of memory such as semantic or procedural memory. For example, say you don't play tennis for a few years. It may become difficult to recall details about particular games played in the past. However, you may still remember the rules quite well as well as how to serve and return the ball if you start playing again.

FIGURE 6.12:   Two Types of Interference

In *proactive interference*, earlier learning (Spanish) interferes with memory for later information (French). In *retroactive interference*, new information (French) interferes with memory for information learned earlier (Spanish).

Proactive and Retroactive Interference: Interference affects our ability to access information from memory. Generally, the more similar various bodies of information are the more interference will be generated. Thus, interference effects would be greater when one learns two similar languages such as Spanish and French, versus less similar languages such as Spanish and Russian. *Proactive interference* occurs in a forward direction, when previously remembered material interferes with the retrieval of subsequently remembered material. Having first learned Spanish and then French, the Spanish can interfere with how readily or accurately one then can retrieve French language information. *Retroactive interference* occurs in a backward direction, when later remembered material interferes with the retrieval of previously remembered material. Having first learned Spanish and then French, the French can interfere with how readily or accurately one then can retrieve Spanish language material.

Retrograde and Anterograde Amnesia: These really are two very different phenomena, the former being an inability to access previously stored memories, the latter being an inability to form new long-term memories.


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Retrograde Amnesia: The ability to access previously stored information is disrupted. Retrograde amnesia runs backward in time, usually from some point of physical or emotional trauma. Generally, the more recent memories are most severely affected. In rare cases someone may present with total amnesia, having little or no apparent knowledge of their identity or life experiences. They may also have difficulty recognizing faces, including their own in a mirror. However, amnesia is not found for semantic or procedural memories with people still being able to comprehend language and mathematical relationships, and to type or drive. That is unless there is some degree of overall brain degeneration such as found with various forms of dementia. Interestingly, the common inability to recall much from one's early childhood may also be a form of retrograde amnesia.

Anterograde Amnesia: This type of amnesia is characterized by an inability to add new memories into long-term storage. So once information in short-term storage decays it is simply lost. Although rehearsal can help to keep things in short-term memory for a limited time, no amount of rehearsal will allow for permanent retention. However, already consolidated memories remain intact and accessible. An area of the brain known as the hippocampus is responsible for the transfer of information from short-term to long-term memory. If the normal functioning of this structure is interrupted, long-term memories are not formed. Isolated cases of anterograde amnesia occur in conjunction with trauma and shock, with subjects having no recollection of events slightly before and perhaps for hours or days after some event (auto accidents are a prime example). In these cases the functioning of the hippocampus has been temporarily interrupted. An extreme case was that of a man referred to as H.M. who was studied extensively for years. Damage to his hippocampus resulted in the permanent loss of his ability to form new long-term memories.

Corpus callosum
Prefrontal cortex
Temporal lobe
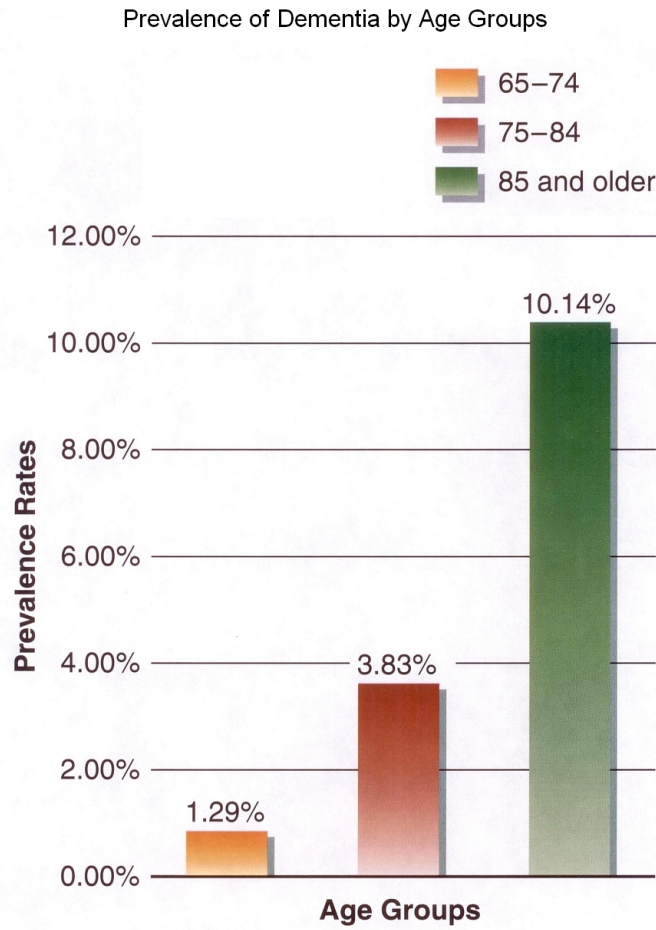Hippocampus
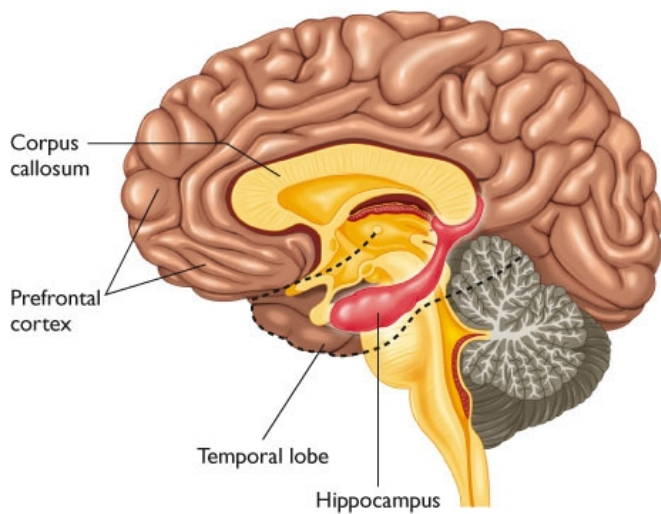
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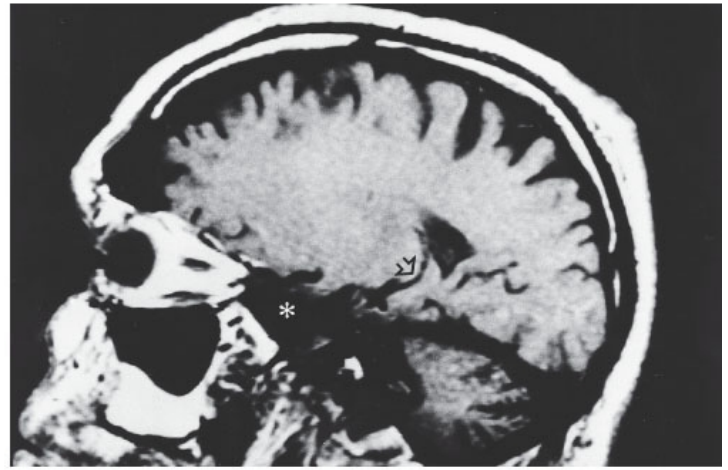
Another cause of anterograde amnesia can be excessive alcohol consumption. In the short run a bout of heavy drinking can produce a drunken blackout (the sedative effects of alcohol can completely hinder the normal processing functions of the hippocampus and frontal lobes for a time). However, in more serious cases of long-term excessive alcohol consumption specific damage to the pathways connecting the hippocampus to areas of the cortex (particularly the mammillary bodies) can result in permanent anterograde amnesia. This condition is known as Korsakoff's syndrome and is actually the result of B-vitamin deficiencies that often accompany chronic long-term alcohol abuse. Once these pathways are destroyed the hippocampus can no longer transfer neural patterns to areas of the cortex for long-term memory storage. The result is that the ability to form long-term memories is lost from some point in time onward. No new material ever gets put into long-term storage, so there is nothing there to retrieve.

The Question of Forgetting: Access and Retrieval Difficulties versus Actual Loss. The question of whether long-term memory lasts forever remains unsettled. Some items are easily accessed even after long periods of time, others are only partially available, and others seem to be completely forgotten. The hippocampus is the primary brain structure responsible for the transfer of material from short term to long-term memory. Presumably it also plays a role in retrieving information back into short-term memory from long-term storage. There may also be some form of localization of storage, with faces and semantic memories being stored in the temporal lobes, episodic memories in the occipital lobes, and procedural memories perhaps in the parietal lobes. The frontal lobes may then play more of a role in categorizing and associating various memories, as well as memory cues. Every time we retrieve a memory from long-term storage we generate new synaptic connections and devote more brain matter to that information, but we may also change it in light of more recent experiences. Some items are more easily retrieved than others, some times only a single detail is elusive (as in the tip of the tongue phenomena). Sometimes things we at one time were quite well versed in seem completely forgotten, such as a paper one wrote several years earlier and now one has no memory of its content or even of having written it.

Dementia: There are two principle forms of dementia. Alzheimer's disease has to do with the formation of protein-based plagues in the brain that disrupt neural connections and eventually lead to the destruction of neural cells. Alzheimer's was originally referred to as early onset dementia since it can develop as early as one's late 40s or early 50s. But Alzheimer's is prevalent in older individuals as well. The other common form of dementia is multi-infarct dementia. It is the result of small strokes occurring in the brain. These may go unnoticed as they don't affect motor function, but they do destroy neural cells and as a result disrupt memory. This form of dementia is more likely to occur as a result of advanced age. Treatments for different forms of dementia vary and it is important to determine the type of dementia so the most effective treatment can be administered.

It should be noted that other conditions in the elderly sometimes mimic the effects of dementia. In particular, urinary tract infections can cause toxins to accumulate in the bloodstream, which in turn affect cognitive processing. The individual may become increasingly disorientated, confused and have problems remembering things. But simple treatment with antibiotics can fully restore mental function.

Although the number of people suffering from various forms of dementia is growing, the main reason for this is the fact that the number of elderly is growing. Percentage-wise the majority of people are still in control of their mental faculties well into their 80s and beyond.

Prevalence of Dementia by Age Groups

- 65–74
- 75–84
- 85 and older

10.14%

3.83%

1.29%

Prevalence Rates

Age Groups

Cognitive Psychology

The essential concept in cognitive psychology is thinking, the nature of thought, particularly in respect to problem solving. At some point the strictly behavioral approach to psychology begins to fall short, encompassing less than what one might consider necessary for a complete understanding. This is especially true when one is considering human psychology, although it applies to animal psychology as well. There just seems to be something more going on than simple automatic responding to certain basic stimuli or learned signals, or responding in order to either gain reinforcers or avoid punishers. Recall that behaviorism as Watson originally defined it was never intended to deny the existence of mental events. It simply didn't require consideration of them in order to predict and control behavior, or explain much of what both animals and humans do. However, at some point we want explanations that go beyond mere prediction and control. Ultimately we want some understanding, not only of our actions, but of ourselves. We want to examine our thoughts and feelings, compare them to those of others, and so forth. And although we may be inclined to attribute many similar processes to other animals, we're also curious about those capacities and abilities that may draw the line between animals and humans. As a result, more and more and more of what has been traditionally within the realm of philosophy is now also studied as part of cognitive psychology.

Expectations: Given past experiences, are specific outcomes expected for behaving in certain ways in a particular environmental context? We do seem to have more than a vague sense that something good (or bad) will follow a certain behavior. Indeed, we usually have a very specific idea of what consequences will follow a particular behavior, and are either surprised or dismayed when that is not the case.

Frustration - Usually displayed as a form of aggression. Animals display signs of frustration if reinforcements are changed, especially if downgraded to less valuable reinforcements. And so birds flap their wings, rats squeal, monkeys throw things. Children throw tantrums. And adult humans succumb to road rage, and batter vending machines that don't deliver. These, and similar outbursts, are all cited as evidence that certain expectations were held, and were violated.

Imitation and Observational Learning - Creatures naturally observe other creatures given the opportunity. Note that this provides an opportunity for learning to occur. After observing others, if a subject is placed into a similar context, and given a chance to make a response, similar consequences as had been observed are expected. Observation tends to bring about imitation because the observed consequences are effective in changing the probability of certain responses in the observer even without first-hand experience. Thus, the effects of reinforcement can influence behavior indirectly through the observation of another's behavior and the subsequent consequences.

Albert Bandura's work in this area has shown that observational learning applies equally well to viewing a video recording as it does to observing others first hand. That raises questions regarding the influence of movie and television programs, especially when violence is depicted. In particular, what happens when characters profit from violent actions? Are viewers more likely to adopt violent methods to further their own interests? Will they become desensitized and more accepting of violent behaviors in general? The answer is yes, in the short-term immediately after exposure. For example, they may be more likely to consider violence as a means to settle a dispute. But the effects are transient. Their behavioral patterns are not permanently altered. It is also the case that whatever effects there may be, they do not seem to be additive. People don't seem to become progressively more prone to violence as they continue to view it in movies and television.

Keep in mind that there are many sanctions in normal society that are in place to curb violent behavior. And unlike what happens in movies and television they represent real world consequences for one's actions. So while violence may appear as an appealing solution to problems in movies and television, in the real world it is not. This is the idea of *deterrence*. When others are punished for committing crimes it is supposed to act as a deterrent, stopping others from committing similar acts. One is supposed to learn form the mistakes made by the criminal. But isn't this deterrent effect negated (at least partially) when it is witnessed by only a few? One cannot learn by observation without actually observing the consequences vested upon the offender. So what is the point of having a death penalty if it is carried out in a private setting and viewed by a limited few?

Latent Learning: Tolman found a *distinction between learning and performance.* One can only infer that learning is taking place, especially if subjects are just allowed to explore their environment and behave randomly, or merely to observe others. The addition of specific consequences can rapidly change the nature of responding, demonstrating that learning had been taking place all along. So it is that we must often look at performance as an index of ongoing learning, as in *testing procedures.* So think of the exams in this class as an invaluable opportunity to demonstrate what you have learned.
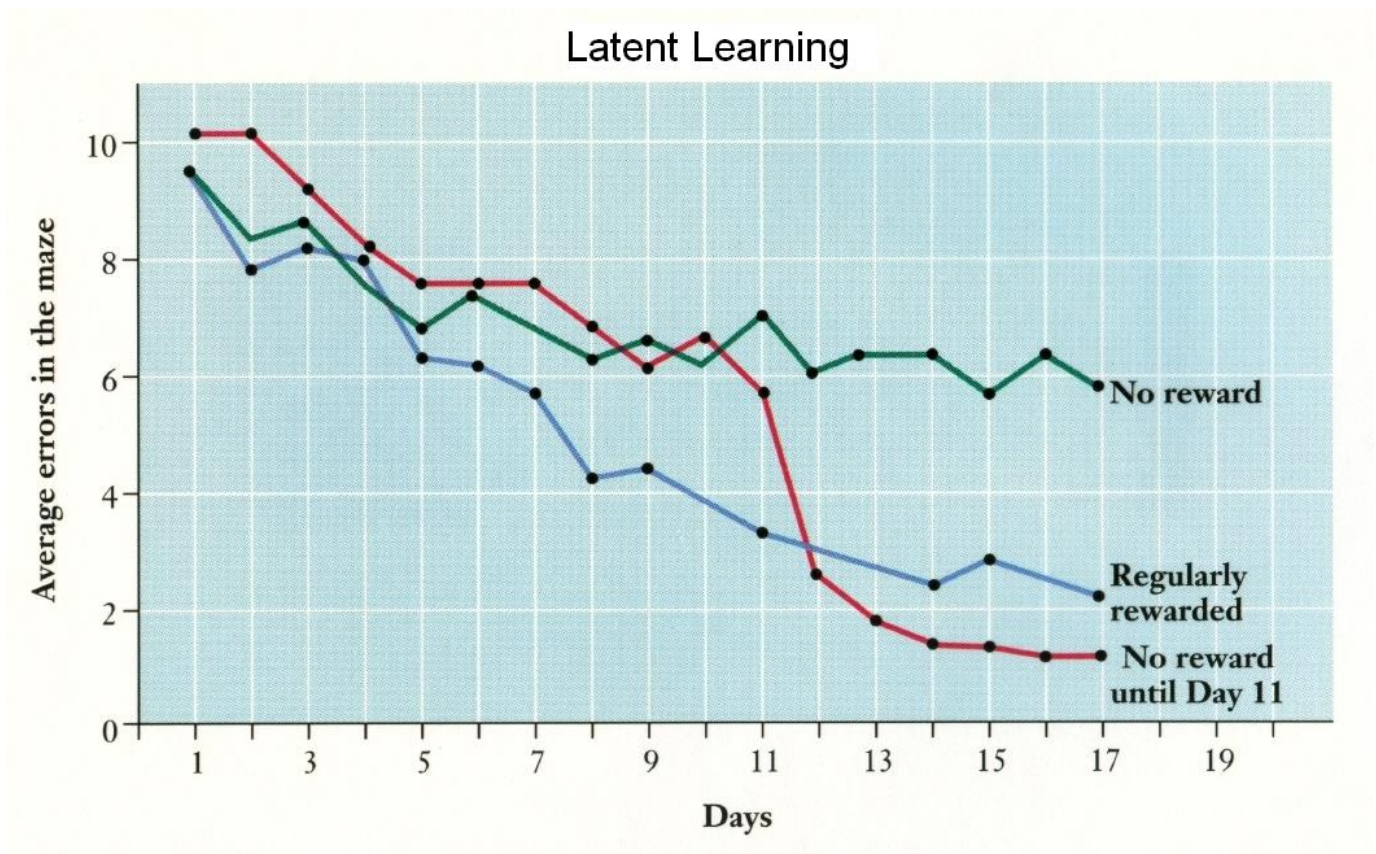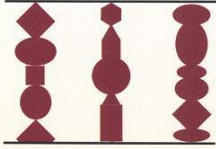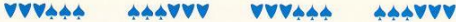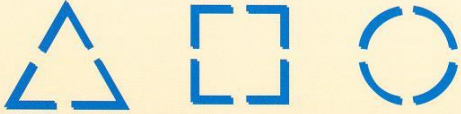
Cognitive Mapping: The idea of a cognitive map goes way beyond just recognizing landmarks and using them to guide ongoing behavior. A cognitive map is an internalized representation of the area in question. Once acquired a cognitive map can aid in recognizing and utilizing new routes, shortcuts, and to effectively deal with detours. Foraging behavior utilizes this capacity both as animals seek food (generally not covering the same place twice) and in recovering hidden supplies.

Cognitive Maps - Detour Test

Food box

Block *B*

Block *A*

Start box

Route 1
Route 2
Route 3

CLOVER PATCH

EMERGENCY HOLE

C
A
R
R
O
T
S

MAIN HOLE

Fun and **Games**: Play often involves forethought, planning, and rules. Dolphins in captivity have been observed playing a game in which they pass a bubble ring between each other. In order to play the game they have to purposely generate the ring, indicating planning and forethought. Even a simple game like tag involves a certain level of sophisticated thought. One must understand the concept of being "it" and how to respond appropriately. One avoids the one designated as "it," lest you get tagged and become "it." If that happens you must immediately switch roles and seek to tag another. Yet at no time is the one designated as "it" an actual threat. But during the course of the game the individual is treated as such. This may help to hone strategies for avoiding predators. Hence, a number of animals have been observed engaging in this sort of activity. Squirrels do it, for example, so they may have some level of cognition.

  And, of course, humans at all ages play games. They often improvise when it comes to rules and equipment when playing established games. And they often make up their own games. As they do so they need to anticipate what will happen during the subsequent course of play. And after playing they need to analyze what rules were effective and change those that were not. Children are quite good at all of this. Playing games demonstrates adaptability, inventiveness, forethought, and in humans may actually sow the seeds for cooperative behavior later in life.

Categorization and Organization: This involves the recognition of patterns and the use of assumptions based on experience. These allow us to quickly assess a situation and respond appropriately.   People make categorizations of social situations and of other people (social cognition, schema, and stereotypes).   We conceptualize models examples, prototypes, and ideals (Plato's concept of forms) to better organize our view of the world. In perception we often make assumptions based on previous experience (Helmholtz's conception of the unconscious inference). Normally these assumptions serve us well, but in unique situations they may be misapplied and lead to errors and illusions.

Figure-Ground:
The ground is always seen as farther than the figure

Proximity:
Objects that are physically close together are grouped together

Continuity:
Objects that continue a pattern are grouped together

When you see this

do you see this?

plus this?

or this?

Closure:
The tendency to see a finished unit

Similarity:
Similar objects are grouped together

Chessmasters - These expert players learn to recognize classic patterns so that they can predict with great accuracy where the game is headed. Once the pattern is established it dictates the available options, and the best strategy for winning.

Savants - Musical savants detect the patterns in the music they listen to and play. Music has a numerical quality to it that seems to play a role in this. Some savants perform calendar feats, such as being able to tell you the day of the week for any date hundreds of years past or future in a few seconds. Of course the calendar follows a cyclic pattern that repeats every 400 years, with smaller sub-cycles within that. Other savants are able to perform elaborate counting tasks, such as counting cards in blackjack. They are then able to predict when a particular hand is likely to be a winner. In both these cases patterns emerge. The unique ability of the savant is to be able to recognize and utilize these patterns that most of us don't detect.

Heuristics – We develop rules for interpreting information, making judgments, and solving problems that are quickly and easily applied based on perceived patterns and probabilities. However, we may trade accuracy for efficiency by not analyzing each particular situation more thoroughly.

Problem Solving: The goal is to come to a satisfactory solution. That entails finding the quickest available route to the goal. Reasoning and logic need to be applied to the situation. Our initial approach may involve looking for patterns and elements that resemble previous situations, as it may be beneficial to apply solutions learned in previous situations to the current problem. Or perhaps we'll need to recombine pieces of different learned behaviors to solve a new problem. At other times it may be useful to think outside the box, to try to visualize the problem from different perspectives. This can aid in generating new and novel solutions. Intuition involves having a hunch as to what might work. Insight is the term used for unexpectedly grasping the solution, it just comes to you. Puzzles and bar tricks demonstrate many of these principles. This capacity is what is responsible for creativity, art, and invention.

Language: Language is a major component of our cognitive capacity, as well as an area of study in its own right. It may affect how we categorize and view the world and our experiences. It also may be part of what allows us to deal with abstract concepts. And finally, it may be what separates us from the other animals.

Communication vs. Language - Many animals seem to be able to communicate basic needs, wants, and desires to each other, and even to us. And to some extent they also can communicate fear, danger, appeasement, aggression, anger, rage, distress, sadness, pleasure, and happiness. They can establish and communicate information regarding social hierarchies. However it is communication, not language. Meanings are conveyed without any particular rules of form. And it is rules of form that are required to go beyond mere communication to having a true language.

Deep Structure and Surface Structure – Language involves both of these. Deep structure refers to the meaning that is to be conveyed. Surface structure refers to the form of the message, the rules of grammar and syntax unique to the language. These rules of form define what is, and what is not, an appropriate form of expression. Adoption of these rules of form generally allows for greater precision and clarity. These rules of form allow for things like tenses (past, present, and future). And so it is that language is necessary in order to express anything beyond the immediate time and place. Only by way of the rules of language we can express what was the case yesterday as well as what we expect to be the case tomorrow (past and future tenses). Rules of language also allow us to discuss relational concepts, such as above and below, left and right, bigger and smaller, and so forth. And language allows us to discuss the hypothetical, and compose fiction. There is no conclusive evidence of this capacity in animals, certainly nothing like the fluidity with which human beings can apply language to generate a multitude of utterances.

An interesting facet of language is that there are often different, multiple ways to say the same thing. It is possible to convey the same meaning (*deep structure / semantics*) by way of different grammar (*surface structure / syntax*). Consider these two examples: "This is my pen." vs. "This pen is mine." and "I don't care." vs. "I am indifferent." For each of the examples the specific meanings remain the same (deep structure), but the grammar varies (surface structure).

Another intriguing aspect of language is that it's also possible for a particular utterance to have ambiguous meaning. There may be different meanings (*deep structure / semantics*) for the same grammatical utterance (*surface structure / syntax*). Consider these two examples: "Never threaten someone with a chain saw. It may result in an injury." and "Over the years I have learned that visiting relatives can be a real hassle. Often I have found the preparations to be too much work." In each of the examples there are two completely different

interpretations (deep structure), both equally viable given the way the utterance is phrased (surface structure). In the first example, who might get hurt? Will you hurt someone while wielding a chain saw in a threatening manner, or will you get hurt because you threatened a maniac with a chain saw? In the second example, who is going to visit whom? Am I going to visit the relatives, or are the relatives coming to visit me? Often the first meaning we hit upon blocks perceiving the utterance in other ways. Of course, in most situations the context into which the particular utterance is embedded helps define the intended meaning and clears up the ambiguity. In the first example if I add, "You should always handle a chain saw carefully." then I'm warning you about the dangers when you're handling a chain saw. But if I add, "It just doesn't make sense to threaten someone with a lethal weapon." then I'm warning you about the dangers involved from others wielding chain saws. In the second example if I add, "I hate making travel arrangements and packing," then I'm going to see them. But if I add, "I hate having to get the house all cleaned up and preparing the guest room." then they're coming to see me. Often these are the basis of humorous statements, as well as legal and philosophical confusions.

   Chompsky's Language Acquisition Device (LAD) - Because animal's don't seem to be able to utilize anything like a true language it has come to be considered a uniquely human capacity. Noam Chompsky and others have proposed that we may well be genetically endowed with the capacity for language, a Language Acquisition Device (LAD) of some sort within the brain. This lets us pick up on such things as the appropriate phonemes, surface structure, relational phrases, and other elements of a language. We do so relatively easily, especially during a critical time period in early childhood. Although our learning of language is far too rapid to be due to trial and error, it also seems to go beyond mere imitation. Consider that the type of errors made during the acquisition of a language often reflect an overgeneralization of the basic surface structure rules. These are errors adults would seldom make and so could not be imitated (such as 'runned' or 'eated'). So it would seem that as we pick up on the vocabulary we also extract these rules as part of acquiring a language. Thus, grade school actually does not teach these general rules, it merely defines them while pointing out exceptions.

   Worfian Hypothesis - Once we acquire language it changes how we think about the world. As soon as we attend to anything we frame it in linguistic terms. And we express our thoughts and feelings linguistically. We cannot really break out of this mode once it has been established as there is always an internal dialog. We cannot return to a pre-linguistic mode of thinking, such as seeing the world strictly in terms of a series of images, without verbal description creeping into it. This may be a contributor as to why we rarely have direct conscious access to early childhood memories and experiences. They may exist, but in a form we can no longer process once we become fully linguistic. We just can't think that way anymore.

Abstractions: Humans have a capacity to contemplate things beyond the current time and place. Many of these things do not exist in the immediate present, and many are concepts that have no tangible or concrete reality as such. Nonetheless, we are capable of defining and discussing them, of even debating about them. This capacity and these ideas go way beyond simple behaviors that are increased or decreased in probability due to reinforcement or punishment.

   Mathematical Theory and Concepts - Counting and arithmetic are fairly simple, and arguably could be understood within the realm of immediate and concrete reality. But as more concepts are added, such as zero, integers, decimals, and variables; then the ties to the concrete dissolve. We then enter into the more theoretical world of mathematics, wherein most of the concepts are true by definition alone.

   Logic - The concepts of theoretical logic and the application of logical principles both play major roles in problem solving and prediction. Even simple concepts such as negation, inclusion vs. exclusion, and so forth cannot be understood in behavioral terms. Yet, even a child can easily grasp them.

   Invention - We are able to design and create novel devices and so forth to solve problems or otherwise benefit our lives. People constantly come up with new ways of doing things. Hence we have technology.

   The Distant Past and the Future - We can intelligently talk about things that occurred before we were born. A large part of education is to pass on the culture's history and traditions, as well as the collected knowledge that has been accrued. As a result we learn from the past, and progress. Along with this goes the ability to envision the future. We can predict the consequences of our present actions on the future. And we can anticipate, with varying degrees of accuracy, the likelihood of events that may occur in the future. These determinations can be made based on the lessons of history, current trends, recent advances in technology, and so forth.

   Values and Morality - Although it may be possible to point to examples, the true meaning of most of our philosophical concepts are fairly esoteric. Ethics, truth, justice, loyalty, honor, freedom, beauty, and love are only understood in the fullest sense by way of a combination of both experience and contemplation.

Two-Factor Theory of Emotion: Emotions aren't a fundamental experience. Rather, they are the product of general arousal and our cognitions. We interpret our arousal as emotional responses based on our interpretations of situational factors.

   Common Conception - When we experience an emotional response of some sort, that triggers a state of physiological arousal. Little, if any, thought is required.

   Physiological Arousal - The general state of arousal is much the same regardless of what one is experiencing; be anger, fear, or passion. How then do we know which emotion we are experiencing?

   Situational Attributes - Any number of situations can generate physiological arousal. When this happens we look to the situation to better ascertain what we are experiencing emotionally. It is only then that we label the emotion in order to explain it (anger, fear, passion, or some other emotion). So there is a cognitive element. We take cues from the situation (the environment and our actions) to explain, in terms of emotion, the arousal we are experiencing. So we experience arousal, look around to determine what the arousal is due to, then apply the appropriate emotional label.

   Experiments - Schachter and Singer (1962) gave half of their subjects a mild stimulant and the other half a placebo (on a pretence of testing vitamins). The subjects were then given a questionnaire containing rather personal questions. A confederate acting as a subject pretended to be angry and outraged at the questionnaire. The people who had been given the stimulant (and who hence felt aroused) also got angry. However, the people who had been given the placebo were not particularly angry.

   Dutton and Aron (1974) had an attractive woman interview male subjects. In the experimental condition both were on a swaying rope bridge, 200 feet above a river. In the control condition both were on terra firma. Part way through the interview, the woman gave the subject her phone number. Over 60% from the rope bridge called her back, versus 30% from terra firma. They had interpreted their arousal from fear on the bridge as passion and attraction to the woman. Most likely that interpretation was more acceptable to the male ego than admitting they were actually fearful.

New Technology:

   Explanatory - As technology develops it sometimes provides explanatory constructs for describing how our cognitions may function, and how they are organized. And so a model of our thought processes based on computer functions became popular. Research into *artificial intelligence* developed from this model. However, the *linear* nature of computer functions proved limiting. Unlike computers we are capable of multi-processing and cross-checking a vast amount of disparate information simultaneously. Newer, current theoretical models liken our cognitive capabilities to the internet. The concept of *networking* better resembles our cognitive processing. And it even mirrors the physical substrates, such as *neural interconnections* and the *branching of dendrites*.

   Exploratory - Technology has also lead to advancements in our ability to observe the active brain, and explore changes as a result of cognitive functioning. *Brain wave patterns* from EEG readings have allowed us to monitor and measure *reaction and decision making times*.   PET scans allow us to monitor *blood and glucose utilization* by different parts of the brain, and note changes dependent upon mental activity. And Functional MRI scans now provide detailed information regarding *blood flow and activity levels* within the brain.

Social Psychology

Social cognition entails selecting, interpreting, and using information to make judgments about one's social environment in order to better comprehend and understand it. There are many aspects to our social environment including other people, our relationships with them, and situational factors. The biggest problem is that there is often too much data. So methods for sorting it all out in a timely fashion are needed. Once these methods are established it requires less effort to automatically follow along those lines than to systematically process and reassess based on new information. However, a speed versus accuracy tradeoff often results. So our social cognitions may have utility in so far as they allow us to efficiently deal with our social environment, but they often fall short in terms of accuracy. Other processes such as cognitive dissonance, peer pressure, obedience to authority, perceived roles, and the demand characteristics of certain situational contexts all further affect our social assessments and behaviors.

Controlled Processing: Ideally we should logically and systematically assess every individual and social situation to ensure accuracy. But applying a step-by-step analytic algorithm to assess every individual and situation is time consuming, and often not all that necessary. In many cases an in depth analysis is not required, such as brief and transient encounters (other drivers, sales clerks, etc.)

Automatic Processing (The use of schemas): There are the cognitive shortcuts we use to organize our social experiences. These are referred to as schemas (heuristics) and are often based on intuitive assumptions or emotional reactions. Schemas influence which aspects of an individual or situation that we notice, attend to, and deem significant. Schemas provide the basis of our assessments and interpretations of people and events, as well as subsequent courses of action. Well established schemas also act as filters, screening out inconsistent information. We utilize schemas because they are efficient, can often be fairly accurate and because we are seldom motivated to perform an extensive exact analysis. It's a matter of speed versus accuracy, with speed usually winning out. And as already noted, often an in depth analysis is not required, such as brief and transient encounters. As a result people may become overly reliant upon schemas. A high degree of motivation is needed to take on the task of revising schemas. Only if enough data runs contrary to a particular schema (reducing its utility) do we even perform a cost/benefit analysis to determine if it's worth making any revisions. Rarer still are occasions when we actually do rethink and revise schema. Perhaps we should train people in these skills and encourage them to use them more in order to improve accuracy and do away with prejudicial stereotypes.

Factors Related to the Use of Schemas: Judgmental Heuristics are quick and efficient generic rules related to the use schemas and the justification for that use.   A number of properties govern how schemas are used and maintained in social situations.

   Lack of Skill - We differ in our methodical reasoning capacities, the ability to be objective, and in our critical thinking and assessment skills. Many don't have the necessary skills needed to perform truly accurate assessments of the various people and situations they encounter. As a result we may not even develop ourselves many of the schema we utilize. Some of the schema we employ may be derived from our upbringing, from family and friends. They may be passed on from generation to generation. Recall also that memory can be reconstructive to a certain extent. We remember key elements and fill in details (sometimes not exactly, but as a function of reconstructed context). So our memories may be altered, and subsequent experiences tempered, to be more in line with the overriding schema.

   Availability - We generally employ the schema that most easily comes to mind based on observed characteristics or situational factors.

   Representativeness - We use remembered examples of typical or representative cases to classify new data. Does it fit the prototype? This is often referred to as pigeon holing or stereotyping. Stereotypes, in and of themselves, are not necessarily bad. It's the use to which they are put that can be problematic. If used to justify prejudice or discrimination they can be quite harmful.

Impulsivity - Especially in western societies there is an emphasis on action rather than thought. We are encouraged to make a decision and act, not to contemplate and examine different perspectives. Thoughtful and controlled processing is perceived as requiring too much time and energy, and in the short term it does. In the long term, however, that kind of processing may ultimately save time and energy by averting poor decisions based upon automatic processing. Consider failed romances or business ventures that in hindsight cause one to wonder, "What was I thinking?" Adding to this is the *overconfidence barrier.* We're more certain than we ought to be with regard to an established schema. We think we're better at accessing people and situations than we actually are.

Primary Factors - Particular characteristics may carry considerable weight in evoking a particular schema, overriding everything else. Appearance (attractiveness, gender, age, height, weight, and dress), job title (professor vs. student, CEO vs. farm hand), surroundings (big home or office vs. rescue mission or park bench), property (expensive car vs. city bus) are all very obvious and hard to ignore. And certain further expectations are often tied to them.

First Impressions and the Perseverance Effect - Our initial assessments of people or situations are quite powerful, subsequently filtering all further information. What we actually attend to and remember is tempered by first impressions for quite some time. We often employ a strategy of *Anchoring and Adjustment* to alter new information towards those initial impressions. And we cling to our interpretations of people, events, or situations even when faced with discrediting information. It is easier to ignore new information than revise schema. Often we employ *biased sampling* to find reasons to exclude contrary data. Hence the phrase, 'the exception to the rule.' Sometimes we just discount contrary information altogether. It's simply easier and more expedient to continue thinking as one has in the past.
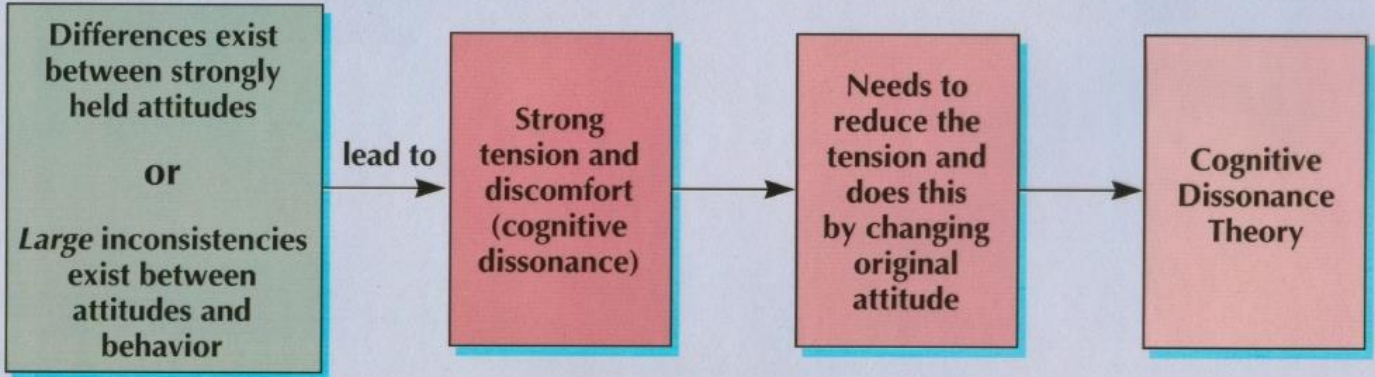
Counterfactual Thinking – Related to *biased sampling*, but in this case what might have been, or very nearly was, becomes just as important as the objective reality. For example, local newscasters invariably mention alcohol when reporting on serious traffic accidents. If alcohol wasn't involved, then they make it a point to mention that, as if it's somehow odd that it wasn't a factor. And so the idea that this was just the kind of accident that often involves alcohol becomes part of the message. Yet they rarely mention how tired one or more of the drivers was, despite that being a major factor in many accidents. Nor does anyone ever report on a bank robbery, adding in that alcohol was or wasn't involved, as such assumptions do not apply to these cases.

Subtle Factors - Very minor, seemingly irrelevant cues may influence our impressions as well. A slight gesture may be interpreted as meaningful, especially if someone is looking for it. Thus, an accidental touch may be interpreted as a sexual advance by someone attracted to you. An offhand remark may be taken as a challenge by someone looking to start a fight.

Names - Consider that before we ever meet someone, their name may trigger certain ideas. Of course, people do make a choice from among the options their name provides, or others apply the one that seems most appropriate (a particular variant of the name, their middle name, a nick name, or initials). But we often attach great significance to that choice. We also make associations based on past experiences with others having had that name, or in the case of unusual names with others having equally uncommon names. And once we've learned someone's name this filters the information coming in to us. Are not different impressions conveyed by each of the following: Elizabeth, Eliza, Beth, or Liz; Jonathan, Jon, John, Johnny, or Jack; Casandra, Sandra, Sandy, Cassy, Casy, or Candy. By the way, consider names like this for your children. It will provide them with an opportunity for self-expression, and allow them to manage the impression their name evokes.

Self-Fulfilling Prophecy - This is the basis of the *Rosenthal Effect*. Our expectations regarding people or situations influence our actions. And those actions, in turn, often cause the reactions of others to reflect those original expectations. This adds further support to our original assessments and the process continues in a cyclical fashion. So if we perceive that someone is going to be hostile in a certain situation we may act in ways that are defensive and actually evoke a hostile response from them. Of course, we then feel justified in both our assessment and behavior, remaining on the defensive.

Cognitive Dissonance Theory

Differences exist between strongly held attitudes **or** *Large* inconsistencies exist between attitudes and behavior	lead to →	Strong tension and discomfort (cognitive dissonance)	→	Needs to reduce the tension and does this by changing original attitude	→	Cognitive Dissonance Theory

Cognitive dissonance

Contradictory behavior

Event
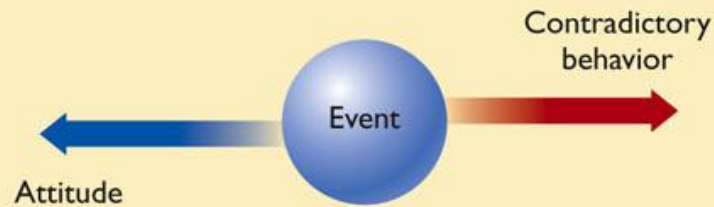
Attitude

Relieving cognitive dissonance

Behavior

Attitude

Event

Change behavior to match attitude

Event

Behavior

Attitude

Change attitude to match behavior

Event

Behavior

Attitude

New attitude

Adopt new attitude to justify behavior
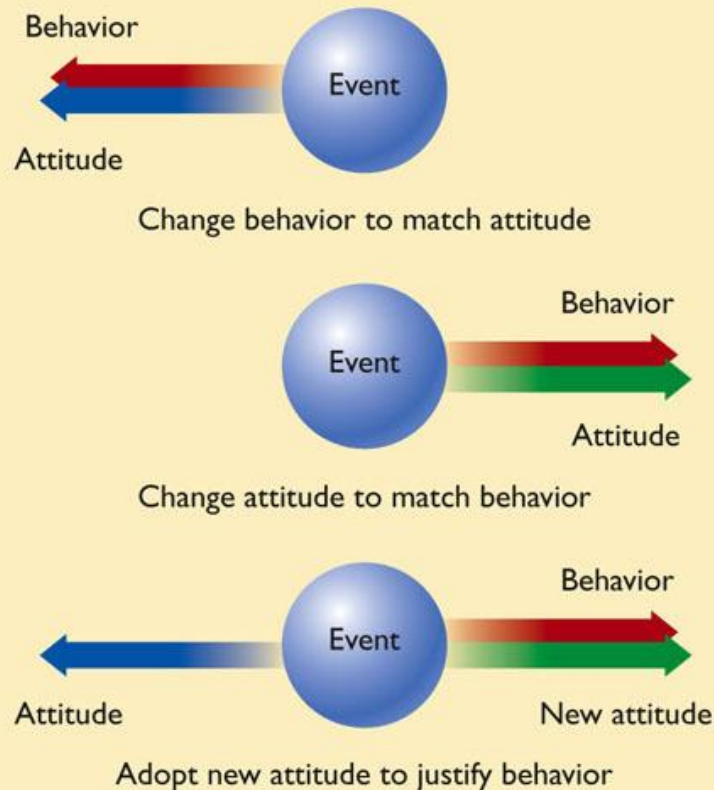
Cognitive Dissonance: (Festinger, 1957) Cognitive dissonance is based on the idea that recognizing inconsistency within ourselves is unpleasant. Discrepancies between strongly held, but opposing attitudes or beliefs generates an uncomfortable degree of uncertainty. If one's actions are incompatible with one's attitudes or self-perception then we are uncomfortable as well. So we make certain adjustments to bring things back in line. When it comes to behavior our mistakes are often difficult to deal with. People prefer to think of themselves as intelligent, not stupid. We like to believe we've made good decisions, and haven't acted foolishly or been conned. And we don't want to admit sacrifices made in vain. These things reduce the otherwise grandiose impression we have of ourselves. We don't want to be humbled, have our egos bruised, or have our self-esteem diminished. Those things indicate we're not always in control and may even invoke a twinge of inferiority. And all of that is unpleasant, even scary. This will not do. So we simply don't admit it. To deal with this the interpretation of events may be altered, often in ways that defy logic, in order to retain an image of intelligence and so reduce dissonance. The tendency is to find anything, any other reason for one's actions, rather than admit personal fault. We also tend to get emotionally invested in the defense of our actions, especially the foolish ones. As a result logical arguments have little effect in swaying us. We desperately want to believe that we've made the right choice, that we are intelligent, and that we are in control.

Scientific Theories - Cognitive dissonance even applies to scientific concepts and their acceptance. Theories seldom cover everything, and further research usually points out more and more shortcomings. But when a new theory is presented often it is not readily accepted, especially by those who have devoted their careers to the old theory. This is despite the old theory's limitations and the new theory's advantages. The tendency is to patch and revise the old theory, some times to the extreme. Those clinging to the old theory do not want to admit that they've been on the wrong track for most of their careers. So often it isn't until the old guard retires and the next generation tasks over that a new theory comes to replace the old, a process known as *paradigm shifts*.

Initial Difficulty - If we have to work hard to get something we tend to value it more once we have it. An education is that sort of thing. Interpersonal relationships can be like this too. We are more inclined to overlook shortcomings in others if it was difficult to establish a relationship with them in the first place. We de-emphasize the bad qualities and over-emphasize the good qualities in order to justify the effort. So it may pay to play hard to get, you'll be able to get away with more.

Value - There is an old adage: A fool knows the cost of everything, but the value of nothing. Cost often has an effect on the value we place on things. If we pay more for something we assess it more positively than something inexpensive. We have to justify the higher expense by extolling the virtues of the item and de-emphasizing or ignoring the faults or problems. But we readily criticize inexpensive items and note that, "you get what you pay for". Brand loyalty develops along these lines. Despite problems we keep buying the same brands, because to do otherwise would be to admit we'd been mistaken all along. And we find further reasons to justify those decisions. Sure this type of car needs a lot of maintenance, but that provides an opportunity to hang out with those great folks at the garage.

Can't Loose Scams - Extended warranties provide an example. You pay extra for these warranties when you purchase a product. If the product doesn't break that's okay, it means you choose a quality product. You ignore the fact that you shelled out for an extended warranty but never got anything out of it. If the product breaks that's okay, you were smart enough to get the extended warranty. You ignore the fact that the thing actually broke, even more so if the service you received was good. Either way, you'll be inclined to buy the same brand again, from the same place. And you're likely to purchase the extended warranty again.

Effect of Payment - How much we are paid to perform a task affects our assessment of the task. If paid well for some task people are less likely to rate the task favorably than if they were not paid particularly well. If paid well, then we did it for the money. But if we are not paid well, then there must have been some benefit to the task itself that kept us going. So in the latter case, we assess the task more positively. This is related to the effects of extrinsic motivation on intrinsic motivation.

Cults - This is the extreme version. Cult members often give up material goods and allow themselves to be used in various ways. Yet, when the cult leader is found to be wrong, lying, unjust, corrupt, or otherwise lacking the evidence is denied. Instead, excuses are offered in explanation. The cult leader continues to be glorified by the followers. The only other option is to admit having been duped by a charismatic individual. So one refuses to believe that one has been conned by the cult leader. Examples: There simply is something wrong with the telescope that prevents seeing the spaceship in the comet's tail as it speeds here to pick up the believers. The Great Pumpkin didn't come because this pumpkin patch just wasn't sincere enough.

Social Pressure and Peer Pressure: We have a tendency to *conform*, to follow the will of the group. In some cases we will even go against what we know is right in order to avoid the discomfort associated with going against the group. This is especially the case if we identify with the group members, either feeling one is a member or wanting to be one. By conforming we are further assimilated into the group. An example of this is the commonly accepted appropriate social distances of our culture.

Socially Appropriate Distances

Appropriate Space	Relationship or Activity
Intimate distance (0 to 18 inches)	Lovemaking, wrestling, cuddling, fighting
Personal distance (18 inches to 4 feet)	Commonly used by friends for casual conversation
Social distance (4 to 12 feet)	Impersonal and business transactions
Public distance (more than 12 feet)	Formal contacts between an individual and the public (e.g., a speaker or actor and the audience)

Source: E. T. Hall (1966).

Obedience to Authority:

> … we know enough, if we know we are the king's subjects: if his cause be wrong, our obedience
> to the king wipes the crime of it out of us. - *Henry V (Act IV, Scene I)*

There is a tendency to discount one's own conscience and deny any personal responsibility when following orders. It is assumed that those in charge are ultimately responsible, rather than the individual actually committing the act. There are some extreme examples of this throughout history, especially military history. Milgram's (1962) study pointed out how even the perception of minor authority, without any real consequences for disobedience, can still lead to unwavering adherence to orders. People can be quite willing to go to extremes if they don't accept personal responsibility for their actions.

SHOCK GENERATOR
TYPE ZLB
DYSON INSTRUMENT COMPANY
WALTHAM, MASS
OUTPUT 15 VOLTS–450 VOLTS

Voltage energizer

Voltage meter

15 — — — — 75 — — — — 135 — — — — 195 — — — — 255 — — — — 315 — — — — 375 — — — — 435 — 450

| VOLTS | 30 | 45 | 60 | VOLTS | 90 | 105 | 120 | VOLTS | 150 | 165 | 180 | VOLTS | 210 | 225 | 240 | VOLTS | 270 | 285 | 300 | VOLTS | 330 | 345 | 360 | VOLTS | 390 | 405 | 420 | VOLTS | VOLTS |
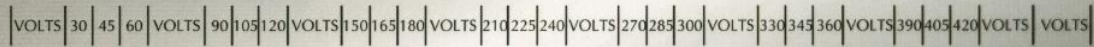
SLIGHT SHOCK — — — — — MODERATE SHOCK — — — — STRONG SHOCK — — — — VERY STRONG SHOCK — — — INTENSE SHOCK — EXTREME INTENSITY SHOCK — — DANGER SEVERE SHOCK — — X X X

TRANSCRIPT OF LEARNER'S PROTESTS IN MILGRAM'S OBEDIENCE EXPERIMENT

75 volts Ugh!

90 volts Ugh!

105 volts Ugh! (louder)

120 volts Ugh! Hey this really hurts.

135 volts Ugh!!

150 volts Ugh!!! Experimenter! That's all. Get me out of here. I told you I had heart trouble. My heart's starting to bother me now. Get me out of here, please. My heart's starting to bother me. I refuse to go on. Let me out.

165 volts Ugh! Let me out! (shouting)

180 volts Ugh! I can't stand the pain. Let me out of here! (shouting)

195 volts Ugh! Let me out of here. Let me out of here. My heart's bothering me. Let me out of here! You have no right to keep me here! Let me out! Let me out of here! Let me out! Let me out of here! My heart's bothering me. Let me out! Let me out!

210 volts Ugh!! Experimenter! Get me out of here. I've had enough. I won't be in the experiment any more.

225 volts Ugh!

240 volts Ugh!

255 volts Ugh! Get me out of here.

270 volts (Agonized scream) Let me out of here. Let me out of here. Let me out of here. Let me out. Do you hear? Let me out of here.

285 volts (Agonized scream)

300 volts (Agonized scream) I absolutely refuse to answer any more. Get me out of here. You can't hold me here. Get me out. Get me out of here.

315 volts (Intensely agonized scream) I told you I refuse to answer. I'm no longer part of this experiment.

330 volts (Intense and prolonged agonized scream) Let me out of here. Let me out of here. My heart's bothering me. Let me out, I tell you. (Hysterically) Let me out of here. Let me out of here. You have no right to hold me here. Let me out! Let me out! Let me out of here! Let me out!

Instructions Used by Experimenter to Achieve Obedience

Prod 1: Please continue. *or* Please go on.

Prod 2: The experiment requires that you continue.

Prod 3: It is absolutely essential that you continue.

Prod 4: You have no other choice; you must go on.

The prods were always made in sequence: Only if prod 1 had been unsuccessful could prod 2 be used. If the subject refused to obey the experimenter after prod 4, the experiment was terminated. The experimenter's tone of voice was at all times firm, but not impolite. The sequence was begun anew on each occasion that the subject balked or showed reluctance to follow orders.

Special prods. If the subject asked whether the learner was likely to suffer permanent physical injury, the experimenter said:

Although the shocks may be painful, there is no permanent tissue damage, so please go on. [Followed by prods 2, 3, and 4 if necessary.]

If the subject said that the learner did not want to go on, the experimenter replied: Whether the learner likes it or not, you must go on until he has learned all the word pairs correctly. So please go on. [Followed by prods 2, 3, and 4 if necessary.]

Taking On Roles: We tend to do what we think is expected of us in different situations. We take on a variety of roles and act accordingly. As a student in class one acts in a certain way, as a parent dealing with a small child one acts differently. These roles can be subtly different or very specific and well defined such as what it means to be a soldier versus an actor or a gang member. Zimbardo's Stanford Prison Study (1970) provides an example of this tendency getting way out of hand.

The Context of the Situation: Often it is the case that certain situations bring out particular behaviors. When assessing the behavior of others it is always necessary to take into account the situational variables in play. We should avoid attributing various traits and qualities to a particular individual, without recognizing that the situation greatly influenced the course of action. Certain situations may cause one to act in ways that are quite contrary to one's overall nature. Both the Milgram study and the Zimbardo study are examples. Those subjects acted in ways they normally would not have acted because the dynamics of the situations were very compelling. The erroneous assessment of individual character, without recognizing the role of situational factors, has been termed the *fundamental attribution error*.

  Decisive Action in Difficult Situations - People are not inherently great leaders, heroes, or despicable villains. But in a certain social context, when decisions need to be made, some people take responsibility and act. Right decisions are looked upon favorably, while poor decisions are not. The results of these judgments are then applied to the character of the individual, not just the particular decision. And often a few such incidents can influence the overall impression we have of the person. So, for example, the person who stands and fights is a hero while the one who retreats is a coward (never mind that if you're in a no win situation standing and fighting is foolish, while retreating is prudent). Although it is generally a mistake is to attribute an overall quality to an individual based on an isolated incident that is what often happens. It is important to understand that the person is simply someone with normal capacity acting decisively in a difficult situation. It has nothing to do with anything being predetermined, immutable, or inevitable. Of course this is contrary to concepts like fate and destiny. But there is no evidence to suggest a grand plan governing all of our actions from birth to death.

  Leaders and Greatness - Given the role that the context of the situation plays we can reject the 'leader principle': that some are born to greatness. This actually seems to be more of a means to justify personal ambition, not a force of nature. And often very capable people fall way short of success, accomplishing little, while those with limited talent sometimes manage to do quite well for themselves. Again it comes down to decisive action. The great leaders and heroes of history were often very average people, sometimes less than average, but at a critical moment they decided and acted. From there history judges them, and keep in mind that it is generally the victorious who write the histories. Some are deemed leaders and heroes, some criminals and traitors, and some are categorized under both headings. Consider a few examples: George Washington betrayed his English heritage and his king to help found the United States. Benedict Arnold went the other way. All of Robert E. Lee's training and expertise was not enough to lead the Confederacy to victory. But in spite of personal tragedies and flaws Abraham Lincoln and Ulysses S. Grant successfully fought to preserve the Union. Schindler was little more than a profiteer before he made his list and saved hundreds from the Nazi death camps. The remainder of Schindler's life was of little note. The point is that *the situations often brought out the best in the individuals*, and in some cases the worst. Moreover, if you don't recognize any of these allusions you are missing a great deal of what history has to tell us about the human condition. The characters of history have much to offer as case studies in psychology.

Helping Behavior and Bystander Intervention: Despite our belief in the inherent goodness of own selves, and of other people in general, we do not always help those in distress.

Kitty Genovese - This woman's murder in 1964 prompted a great deal of research in bystander intervention and diffusion of responsibility. She was attacked and stabbed repeatedly over the course of 45 minutes in front of her apartment complex in Queens, New York. At least 38 residents of the complex heard her screams for help. Many felt that someone should help her, but no one did. No one even called the police.

Urban versus Rural - People are less likely to offer aid and assistance in urban environments. There's a certain degree of stimulus overload so people tend to keep to themselves to avoid being overwhelmed. This has been referred to as the urban *overload principle* (Milgram, 1970). The calmer, less stimulating environment of rural locales might help to lower people's defenses so that they are more likely to notice someone in distress, and to help.

Number of Bystanders - Following the Genovese case researchers Darley and Latane (1970) performed a series of experiments in order to determine what factors have an effect on whether or not a "victim" will receive aid. A major factor was the number of people around. One is less likely to receive help if there is a group of people present. Two reasons for this have been proposed. First there's the idea of *pluralistic ignorance*, we use the reactions of others to judge the seriousness of the situation. If no one else looks particularly concerned we downplay the seriousness of the situation. And if no one else is offering to help then there is no emergency. Of course, if everyone is looking for someone else to act before they deem it a serious situation, then no one acts. Second is the idea of the *diffusion of responsibility*. In the presence of others individuals feel less personal responsibility to act. When it's just you and the victim, either you help or nobody does. When there's a group present, just let somebody else do it. So in the Genovese case everybody thought that, "somebody must have already called the police."

Other Factors - Not Knowing What to Do / Personal Risks (like getting puke or blood on one's clothes, the possibility of disease, legal entanglements) / Liability Issues.

Motivation - Even when we do help others, is it because we're being altruistic or do we gain something by it ourselves? Perhaps we see an opportunity for notoriety, being praised as a hero. Perhaps it distresses us to see someone in need of help because we would like to think that if we were in the same situation someone would help us. Perhaps we help because we know the person in distress and want them to remain part of our lives. Or perhaps we help solely because we care about the welfare of another person, regardless of the consequences to ourselves. It has been argued that the latter case is the least likely scenario in most cases.

Helping Behavior
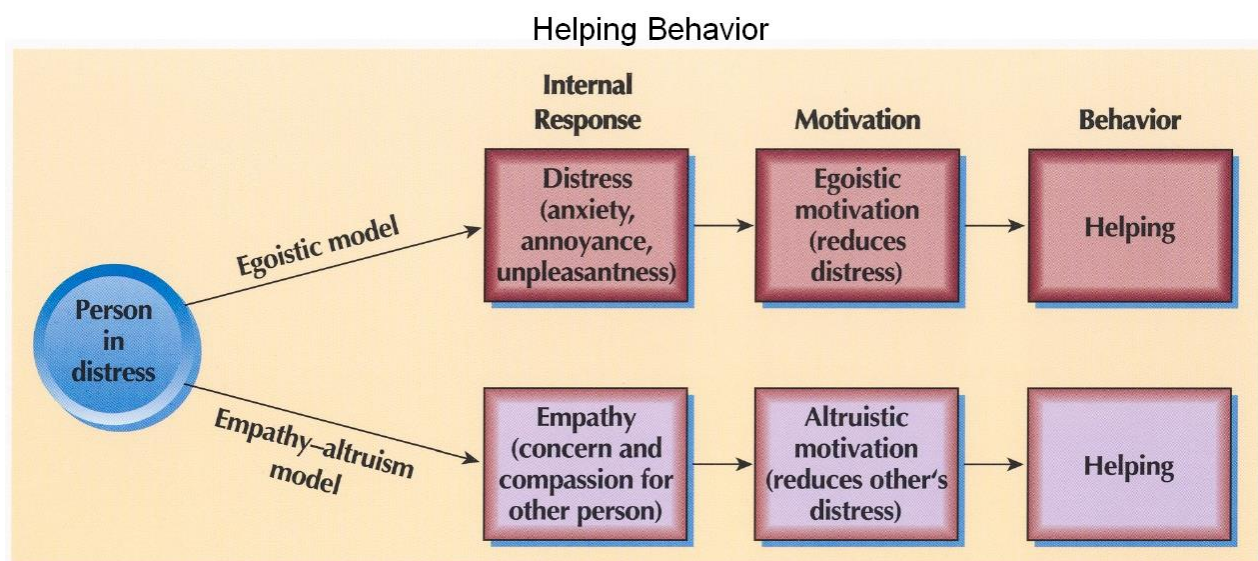
Intelligence -- Cognitive Capacity, Mental Energy, and I.Q.

   Intelligence is an abstract concept, an intangible. It's not something one can reach for and grab. On the other hand, it is something we can recognize when we see an example of it. This has lead to various methods aimed at defining, assessing, and even measuring it. For psychologists and educators the thing of interest has been raw ability, sheer cognitive capacity, untapped potential. The task has been to find ways to assess and measure this potential apart from the effects of education. But it has not been easy as the two are usually intertwined. If such measures could be made they could then be used as an index of an individual's educability.

   Intelligence is a relative term, always inviting some kind of comparison. Most often it is recognized or acknowledged in reference to one individual, or small elite, held in high regard above the remainder of the group. The classic example being the student at the 'top of the class.' However, focusing on this perspective alone oversimplifies and leads to some rather faulty assumptions. One is led to view intelligence as a single overriding characteristic, yet there is no reason to assume this. Unfortunately that is exactly what most early researchers did, compounding that error with an overly emphasized role for inheritance in the transmission of intelligence. And so intelligence was viewed as a general trait, passed on among the elite by way of inheritance.

   The reality is that as soon as more thorough examinations are performed it is readily apparent that there are different levels of intelligence within individuals, as well as between them. No one individual appears to be gifted in every area of inquiry or understanding. However, the more areas an individual is gifted in the more intelligent that individual is assessed to be. And this then leads to the false notion that the individual is possessed of some great defining all encompassing genius.

   It should also be noted that measures of intelligence have been misused. This was often the result of tying these measures to various political agendas. So keep in mind that many aspects of this research are controversial.   Given the broad range and history of unresolved issues tied to this topic, definitive conclusions have yet to be reached on a number of key points.

Examples of Intelligent Behaviors: There are differences in the relative abilities of [different animal species](#), and comparative abilities between individuals of the same species (including humans). Examples of isolated behaviors that hint of intelligence include squirrels playing tag and tool use by chimpanzees in the wild (using sticks to capture and eat termites). We can also include training domestic animals to perform tricks, and the differences in trainability between species. Debates focusing on which pets and domestic animals are more intelligent are common. However, the trainability of dogs vs. cats, or pigs vs. horses, really has little bearing on intellectual capacity. It is more a matter of specific talents and compliance. Similar debates often center around whether grazing animals or predators are more intelligent. It's hard to say which requires greater intelligence, hunting or avoiding predation. Despite interest in all these areas, the overwhelming body of research has focused on human intelligence.

The Nature of Intelligence: It is important to separate the capacity to learn and remember from that of achieving a certain level of education. *Aptitude* is the matter of interest. It can be variously described as raw capacity, basic ability, general faculties, the ease with which one acquires and retains knowledge, or the power to comprehend and deal with abstractions. Consider intelligence more in terms of a dynamic process than that of a relatively stability entity. In this regard intelligence is very much linked to what we term reason. *Achievement* is a very different thing. It is more of an after the fact entity that depends upon, and results from, one's natural aptitude combined with education. It is acquired and reflects what has been learned. However, how one's acquired knowledge is applied in order to solve problems may serve as an index of underlying aptitude. So aptitude and achievement are intertwined. The difficulty has been in separating the two.

Related Terms: There are a number of phenomenon related to intelligence. However, these are generally not considered true aspects of intelligence itself. The distinctions are often quite subtle, and sometimes confusing.

   Talent - A unique ability, but this is not necessarily intellectual in nature. For example, perfect pitch is an ability that is quite useful if one is involved with music. However, having perfect pitch alone does not provide one with the ability to compose music. Nor is it an aid to understanding musical theory, chords, melody, or harmony when thinking in the abstract. And consider that Beethoven was able to conceptualize and compose his ninth symphony after completely losing his hearing.

Skill – This is procedural memory for performing particular tasks. Acquisition has much more to do with repetition and practice than intellectual ability. Developing a skill may be aided by one's natural talent. Learning to play a musical instrument is often aided by having perfect pitch as well as a certain degree of manual dexterity.

Training - Generally this involves little more than a great deal of repetition. This is how one acquires and hones a skill. So a budding musician plays simple pieces over and over again to learn the basic chords and so forth. On certain tasks a particular individual may not require as much training as another, but that often has more to do with natural talent than intelligence. And training also applies to animals. So trainability is generally not considered an index of intellectual capacity. Confusion arises when we talk about training in the use of logic or mathematics. In elementary school children are often drilled on such things as multiplication tables. The capacity to understand such concepts goes beyond the mere ability to memorize rules.

Concrete Reality vs. Abstract Thinking - Talents and skills are generally tied to concrete reality. Intelligence has much more to do with abstract thinking. This distinction may well be what separates talent and skill from intelligence.

Wisdom - The combination of intelligence and accumulated knowledge. This goes beyond initial potential. This is the result of applying one's intelligence to the interpretation of one's life experience. Wisdom involves understanding.

The Perception of Intelligence: Children who readily understand instructions, grasp concepts, and are able to apply what they have learned are perceived to be intelligent.   The faculties allowing for this are likely present, but untapped, in even the very young and the uneducated (regardless of age). Once the opportunity arises to employ this capacity the underlying intelligence of the individual becomes clear. And we recognize in them the potential for further intellectual growth.

Once individuals are grown and educated, intelligence is most apparent among those who manifest both a command of the language and a sizable body of knowledge. The more areas of knowledge someone has mastery over, and can utilize with ease, the greater the perceived intelligence of that person. Note that the real indicator here is command and mastery, the capacity to use the information. Merely memorizing a lot of information, but not being able to do much with it, doesn't really require or imply all that much in the way of intelligence.

Degree of Intelligence vs. Ease of Acquisition and/or Application: Intelligence has most to do with the **degree** to which individuals can come to master information, utilize material, and form strategies to optimally perform or solve problems. This often entails an understanding of underlying processes and principles. The **ease** by which this can be done is not always a great indicator of intelligence itself. Certain factors may hinder the process (yet go unnoticed). Problems with respect to motivation, incentive, concentration, social stigma, reading and other language difficulties (dyslexia), visual as well as auditory impairments may all lead to underachievement. Once these are recognized and either removed or compensated for the individual's true intellectual capacity can be assessed and tapped. Thus, how long it takes to learn something does not always reflect intelligence.

Nor does speed of application apply for similar reasons. It may take certain individuals longer to interpret a problem, but once they do they easily arrive at a solution. So overall, the opportunity to take one's time may be important in assessing real intellectual ability as well as level of achievement. Indeed, timed testing might be far less telling than once assumed. These unnecessary constraints may well mask the abilities of many. And timed testing often generates a speed/accuracy tradeoff. For example, imagine two people taking a 100 question exam. They have ninety minutes to complete the work. One of them answers all 100 questions, and gets sixty of them correct. The other only answers sixty of the questions, but gets all of those sixty correct. So who performed better? And who would you judge to be more intelligent?

Psychometrics - The Measurement of Intelligence: Only in relatively recent times have scientific attempts to measure intelligence been made. Three different approaches have been used.

Anatomy and Intelligence - There are a number of crude anatomical measures that relate to intelligence. However, they are limited in utility and for the most part are only relevant to comparisons between species. These include relative brain size (compared to body size), relative amount of cortical surface area, and the

number and extent of brain surface convolutions. Comparing brain size between individuals of the same species is not particularly useful in assessing intelligence.

Mental Energy - The strength or efficiency of the nervous system. Sir Frances Galton, first cousin to Charles Darwin, is credited as one of the very first to attempt a scientific approach to the measurement of human intelligence. He believed there were differences between people in the strength and efficiency of the nervous system and the energy reserves available to it. These differences are related to a number of functions and the capacity to sustain activity. Intelligence is but one of many abilities derived from efficient nervous system functioning, along with reaction time, attention span, memory, and so forth. It is a by-product of general nervous system function, specifically the ability to process and utilize information. By this account, any measure of nervous system functioning should also index intellectual capacity to some degree. So measures of muscular control, reaction time, perceptual acuity (jnd and threshold assessments), memory, and so forth should also reflect intelligence. This is due to the fact that all of these, and that includes intelligence, are assumed to be related to the underlying strength and efficiency of the nervous system and it's energy reserves. On this view one's speed of mental processing may be an indicator of the strength and efficiency of the nervous system (and intelligence), but not if it's at the expense of accuracy. There's nothing efficient about quickly making an error or rapidly coming to the wrong conclusion.

Galton also argued the case for intelligence being an inherited characteristic. Conceivably intelligence provides for greater adaptability, a selective advantage. So more intelligent animals would fair better. He believed this to be particularly the case among human beings, as intellectual prowess has replaced physical attributes (fangs and claws) in our evolution. Those with greater intelligence would be expected to be more adaptive and successful. Although his conceptions of mental energy and intelligence were for the most part abandoned after I.Q. tests were developed, the concept of the inheritability of intelligence carried on and affected social policies in various ways.

Measures of Relative Ability - In 1903 [Alfred Binet](#) was commissioned by the Paris school system to devise a means of detecting those school children most in need of remedial educational resources. In other words, he was to provide a way to find those children who needed extra help. By 1905 Binet and Theodore Simon had developed a standardized intelligence test. It was based on the general observation that older children are more knowledgeable than younger children. The original Binet-Simon test used items of increasing difficulty measuring vocabulary, memory, common knowledge, and so forth. However, it was limited in that it only classified the sub-par children into a few categories. Revised versions ordered the questions by level of difficulty, reflecting the approximate age at which most children were expected respond correctly. And so a measure of a *child's mental* age could be determined. Thus, if a child performed as well as the average eight year old, then that was the mental age. If the child was ten at the time, then that child was behind.
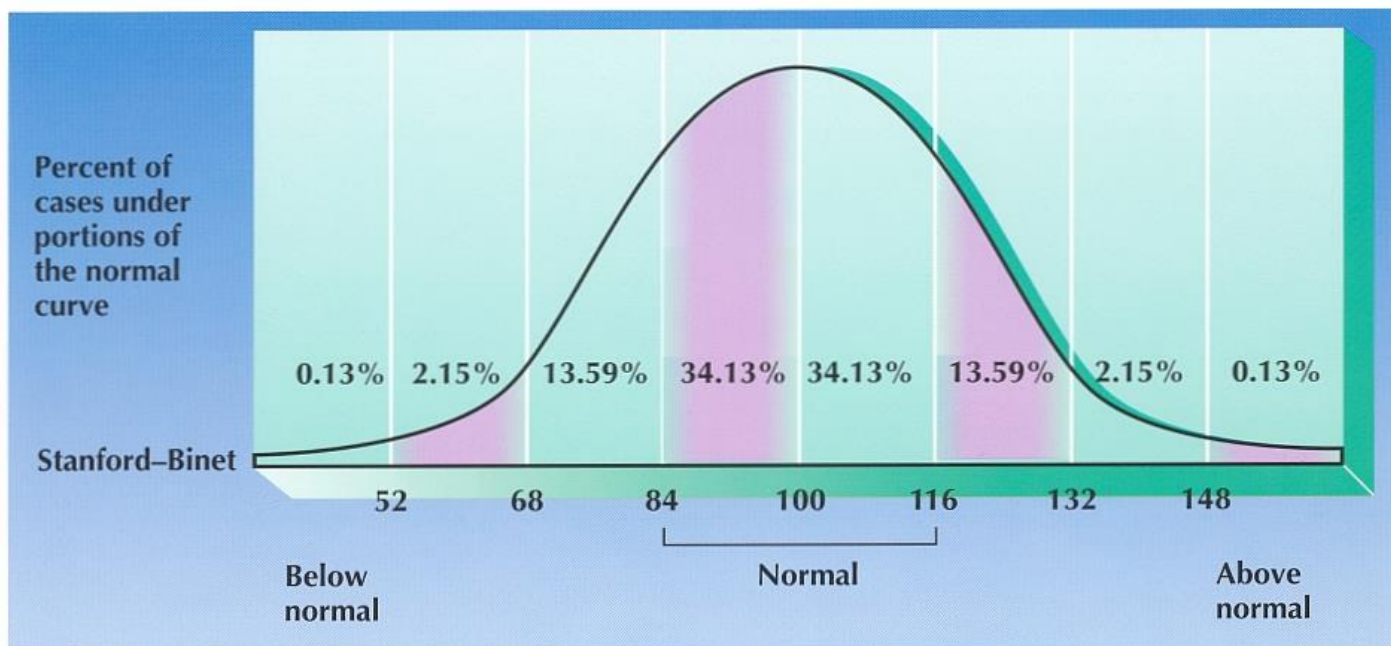
In 1916 Lewis Terman of Stanford University developed a new measure based on the work of Binet and Simon. This Stanford-Binet test reported scores as a function of mental age relative to chronological age. This measure was termed the individual's *intelligence quotient*. This I.Q. was defined as one's mental age divided by one's chronological age, times one hundred (to eliminate decimal increments). If your mental age and chronological age matched, your I.Q. would be 100 (average). If you had a mental age of eight, but were ten years old, then your I.Q. would be 80 (in need of extra educational assistance). However, if you had a mental age of twelve, but were ten years old, then your I.Q. would be 120 (superior and above the norm). So now there was a means of sorting out the brightest children. This was more intriguing than determining who the average or slow children were. As a result, the focus of intelligence testing has been on determining who among us are the intellectually gifted.

The original intention of intelligence tests has been realized in that I.Q. measures are excellent predictors of future academic performance (GPA, SAT, GRE, LSAT). However, there are some shortcomings as well. Childhood measures of I.Q. are not particularly accurate indicators of eventual adult I.Q. This is because brain organization and function are greatly affected by the massive levels of hormones released during puberty. This causes permanent changes that allow the adult brain to better comprehend and deal with abstract concepts and to reason at a higher level. So I.Q. really doesn't stabilize until age 16, after this process is completed. Although they improve with increasing age, earlier measures only provide a hint of the possible adult I.Q. Also, incredibly high I.Q. scores are often erroneous. In very young children they may be the result of extensive advanced preparation. Obviously, children who can read at age three have quite an advantage over their peers and understandably score higher on I.Q. tests. But by age six the disparity is less and the I.Q. scores tend to approach more typical levels. And often children who score exceptionally well at an early age have

memorized a great deal of information. Though helpful for test taking this isn't the same as working knowledge and understanding. So a three year old may be able to recite the multiplication tables, and state that 3 X 5 = 15. However, that same child may not have an answer when you ask: "If you have five apples, five oranges, and five bananas, how many pieces of fruit do you have?" They don't actually understand the underlying mathematical principles behind what they've memorized. Incredibly high adult I.Q. scores are also questionable. These are often the result of statistical anomalies. An individual gets lucky, in one of two ways. Either the version of the I.Q. test given is ideally suited to them, overemphasizing those capacities in which the individual excels, or they just plain guess well. In either case, subsequent testing would yield more typical scores (regression toward the mean). However, most people that score exceptionally well don't take further tests for just that reason.

   A final consideration, how do you compare adults? The use of mental age vs. chronological age works well with children, as their intellectual capacities develop. But intellectual capacity is fully developed shortly after age 16, in the years thereafter we acquire more and more knowledge, but intelligence itself remains the same. So where does the average 20 year old stand against someone who is 40, 60, or 80? Modern intelligence tests such as the Wechsler Adult Intelligence Scale III and the adult versions of the Stanford-Binet are scored based on the presumed normal distribution of intellectual abilities (just as many other attributes are normally distributed in nature). For these tests the score representing the mean of the distribution is assumed to reflect average adult intelligence. That then defines an I.Q. of 100. The standard deviation has been determined to be 16. The majority of the population (68%) is assumed to rank between an I.Q. of 84 and 116. An individual's test results places him or her somewhere within this distribution. Someone scoring one standard deviation below the mean would have an I.Q. of 84, and rank in the lower 16% of the distribution. Someone scoring one standard deviation above the mean would have an I.Q. of 116, and rank higher than 84% of the population.

Distribution of Scores on the Stanford-Binet Intelligence Test

Percent of cases under portions of the normal curve

0.13%   2.15%   13.59%   34.13%   34.13%   13.59%   2.15%   0.13%

Stanford–Binet

52   68   84   100   116   132   148

Below normal   Normal   Above normal

Intelligence

In general, intelligence is the global capacity to act purposefully, to think rationally, and to deal effectively with the environment.

Intelligence Tests

Stanford-Binet Intelligence Scales, 5th ed.
Provides a score for fluid reasoning, knowledge, quantitative reasoning, visual-spatial processing, and working memory.

Wechsler Scales
Provides a performance score (nonverbal) and a verbal score (language or symbol oriented).

Intelligence Quotients

Mental Age
Dividing *mental age* (the level a person answers age-related questions) by *chronological age* and multiplying by 100 gives an IQ.

Mental Giftedness
Individuals who score above 130 on IQ tests are often identified as "gifted." Gifted children typically (although not always) are successful as adults.

IQ and Environment
Most experts agree that improving social conditions and providing a stimulating environment can raise intelligence.

Deviation IQ
Measuring how high or how low a person scores *relative to his or her own age group* gives a different form of IQ.

Intellectual Disability
Mental abilities far below average are identified as *intellectually disabled*.

Causes of Intellectual Disability
Fetal damage, birth injuries, metabolic disorders, and genetic abnormalities may cause intellectual difficulties.

The Misuse of Intelligence and Vocational Aptitude Testing: Two early instances of the extreme misuse of intelligence test results exemplify the danger of tying these results to political agendas.

The Army Alpha and Beta Tests - World War I saw the beginning of widespread aptitude testing (similar to I.Q. tests) by the military. From the test results recruits could be placed in the positions for which they were best suited. Airplanes were high tech for the day, and so pilots would need above average intelligence. However, those with below average intelligence could still serve as foot soldiers or perform support tasks. It was noticed that blacks scored significantly lower than whites. These findings, combined with the current views about the inheritability of intelligence and the eugenics movement, gave rise to the notion that whites were superior to blacks. It was a convenient excuse for continued segregation and discrimination based on racial heritage. And so this interpretation was tied to a political agenda, to justify fewer opportunities for black individuals, and to keep whites on top of the social order. The end result for the military was that the white guys would fly the planes while the black guys would dig latrines. It took a great deal of time before these results were re-analyzed. Ultimately the determining factor was not race, *per se*. These tests were in large part confusing aptitude with achievement. So education played a key role. At the time the best schools were in the Northern and Western states. Those in the Old South were often substandard. Yet the majority of blacks still lived in the Old South, and that's why they were scoring lower. Upon reanalysis, people from *different regions of the country* scored differently, regardless of racial heritage. In fact, the North vs. South effect was even greater than that formerly attributed to black vs. white. This might have been discovered sooner, but the utility of the racially linked findings to promote various political agendas hampered investigations into alternative causes.

Ellis Island - A similar case involved the intelligence testing of immigrants. Those from undesirable countries (a matter of policy based on opinion) tended to score poorly. So quotas and limits were set for the number of immigrants to be allowed entry from countries such as Poland, Greece, and much of Southern Europe. Those from Northern Europe and Great Britain scored well, and far greater numbers of immigrants from those regions were allowed entry. This fit well with then popular ethnic biases, and so became part of a political agenda. It took quite some time before it was admitted that all the intelligence tests were in English. Those coming form places where the native language is nothing like English did not do particularly well. Those who came from countries that spoke English or related languages such as German did well. The administrators who didn't see this as a confounding factor were truly lacking intellectually!

DIGGING DEEPER: Difficulties in the Cross-Cultural Measurement of Intelligence

Given all the problems noted by the textbook with standardized intelligence testing of different ethnic and racial groups *within* the United States, there are even more difficulties when examining intelligence in cultures around the globe. In a review of cross-cultural studies of intelligence, Pick (1980) listed a number of additional difficulties and issues. First, many tests employed to evaluate intelligence are culture-specific, not culturally neutral. There may be differences in the way cultures conceptualize intelligence, and these differences may influence the content and focus of tests. Therefore, differences in test performance may indicate only that members of one culture do poorly on tests designed for another culture, not that intelligence differs. Intelligence test performance may also be affected by factors other than the test itself. Pick (1980) noted that research has indicated that performance on intelligence tests has been found to vary as a function of motivation and attitudes toward test taking, familiarity with test taking, residence in a rural or urban area, educational level, and nutrition (especially a protein-poor diet early in life). These factors make the assessment of intellectual abilities across different cultures, as well as within cultures, difficult. Reported performance differences should be interpreted with a great deal of caution. Segall et al. (1990) argued that performance differences between cultures may only indicate differences at the level of content rather than process or competence. In addition, they caution that differences should be treated in a non-evaluative, purely descriptive way and not immediately assumed to reflect a deficit for one culture.

Pick, A. (1980). Cognition: Psychological perspectives. In H. C. Triandis & W. Lonner (Eds.), *Handbook of cross-cultural psychology: Vol. 3. Basic processes* (pp. 117-154). Boston: Allyn & Bacon.

Segall, M. H., Dasen, P. R., Berry, J. W., & Poortinga, Y. H. (1990). *Human behavior in global perspective: An introduction to cross-cultural psychology.* New York: Pergamon.

The Inheritability of Intelligence: This has been the major issue surrounding intelligence, and the most controversial. Starting with Galton, toward the beginning of the 20th Century, this idea was proposed over and over again. It fit well with the current theories of *Social Darwinism,* according to which the poor were poor because they deserved to be so. They lacked either motivation or intellectual prowess. This also justified and vindicated the wealthy, and any means by which they may have acquired their wealth. They deserved their wealth because they were better than the poor. Survival of the fittest dictates that the superior must grind the inferior underfoot, without remorse. Another conclusion was drawn from this view, resulting in a number of social movements. The first was selectively breeding for the trait of intelligence, *eugenics*. Groups formed in Britain and the United States, aimed at getting those with higher intelligence together, to find potential mates of compatible intellectual abilities. It was believed that this would improve the gene pool for the species as a whole. Along these lines, the next step was the sterilization of those deemed to be intellectually inferior. Tens of thousands of mental patients were sterilized. U.S. Supreme Court Justice Oliver Wendell Holms wrote of the necessity of these procedures, for their own good and that of the population as a whole. They would not be capable of parenting anyway, and this would also prevent them from corrupting the gene pool. The Nazi movement came up with the final solution, just plain murder whoever was deemed unfit for whatever reason. This went way too far, and even the less atrocious measures were abandoned.

General Intelligence vs. Multiple Intelligences: Is intelligence a general overriding characteristic, a single entity that pervades all of what we do? Or is it a collection of various specific abilities, concentrated in a number of particular areas. On this view we would have greater abilities in some areas than others. And people would vary in the number of areas in which they have a certain degree of intelligence. And so one could assume that the markedly intelligent are possessed of this kind of greater ability in a number of more areas than other individuals happen to be.

Most of the research has been interpreted to support the general characteristic view of intelligence. This has especially been the case for those fervently exposing a large inheritability factor to intelligence. Consider that different tests such as I.Q. and SAT often measure much the same thing (the ability to learn the type of academics commonly taught in our schools as dictated by the marketplace). One would expect these scores to be highly correlated, and so they are. Scores on one measure are strong predictors of scores on the other. So the mean I.Q. of 100 is analogous to the mean SAT score of 500. And one would expect someone with an I.Q. of 116 (one standard deviation above the mean) to score similarly on the SAT, around 600 (one standard deviation above the mean).
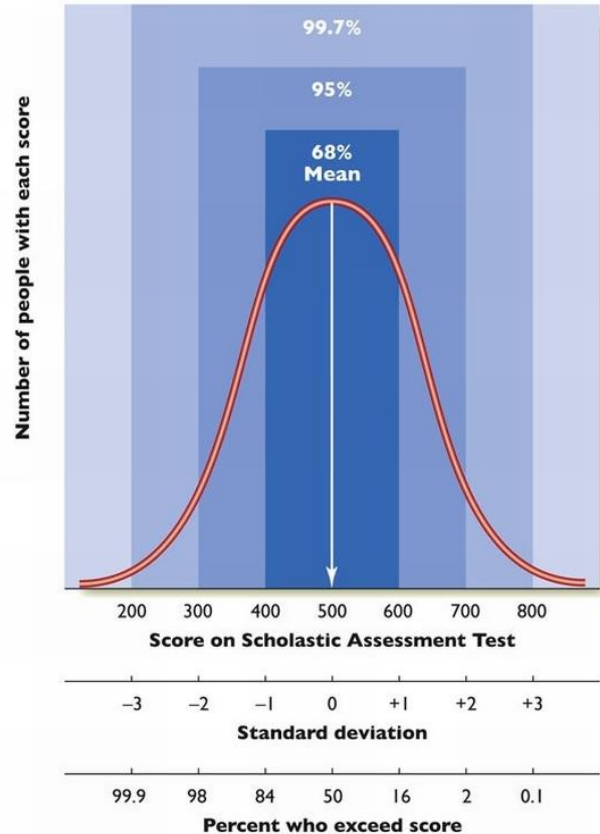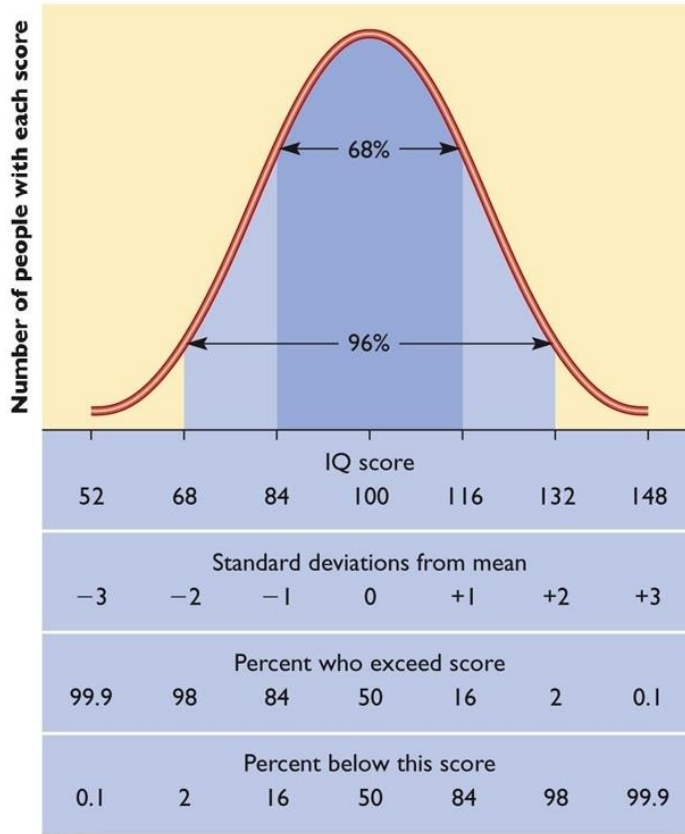
During the development of new test versions, and new types of tests, similar comparisons are made. Often adjustments are made to increase the degree of correlation between new tests and to those already in existence. Eventually comparing all these correlations becomes cumbersome, so a new level of analysis was employed to examine correlations between all of these correlations. The concept of *g* (for *general intelligence*) is an emergent property derived from this type of meta-analysis of multiple correlational comparisons between various different tests. As an explanatory concept g aided researchers in designing other intelligence tests that would tap into similar abilities. But the researchers began to take it too seriously, and committed an error known as reification. Over time the explanatory concept of g has become the thing that needs to be explained. It is the thing to look for, and intelligence tests deemed heavily g-loaded are favored. This view was combined with the ideas about high inheritability was also used to support various political agendas. The result has often been used to justify and maintain the current social order, if not to bolster it further. Those in power have no desire for even the consideration of alternatives. And so family background and 'good breeding' continue to be important determinants of social opportunity.

However, this is not an inevitable conclusion. Most of what are called g-loaded tests, those designed to assess general intelligence, are actually limited in scope. They focus primarily on academic abilities, with little concern for other potential important aspects of intellectual function. The reality is that theories based on multiple areas of intelligence could produce similar meta-analysis results if focusing on just academic abilities. But theories of multiple intelligences go beyond just those academic abilities; recognizing creative and inventive capacity, musical ability, how adept one is at social interaction, and so forth. And consider modern research into the genetic code. As complex a phenomenon as it is a number of different alleles on a number of different genes most likely contribute to intelligence. And that implies multiple different intelligences that may

be independently determined. And of course other factors, such as nutrition, play a role in the degree to which those traits are expressed. Likewise, the concept of localization of brain function coincides with this view as well. We know that different areas of the brain perform different intellectual functions. It's most likely that some of those areas are better organized, leading to higher ability in the type of intellectual function served by those areas. Taken together, logic dictates different realms of intelligence, with those perceived as having greater intelligence simply having enhanced abilities in a greater number of areas. And if this is the case, then nearly everyone may have an area in which they have the potential to excel.

  This also explains why geeks can have a capacity to recognize numerical patterns, and so memorize pi, easily solve Rubic's cube puzzles, and so forth. Yet they cannot converse outside of specialized areas, have little capacity for advanced humor, and have difficulty picking up on the subtleties of social grace. They have highly specialized pockets of great ability, but also grossly extreme deficits in other areas.

The Value of Intelligence: Is intelligence, in and of itself, a good thing?

  Even in the realm of simple biology, evolutionary theory points out that all the great advances seem tied to the greater development of intelligence. Increased intelligence bestows greater adaptability. Hence the more intelligent species tend to dominate. But this only makes the case for the utility of intelligence, an in that limited sense it may be a good thing. But consider human history. Advancement in one area has often been the trigger for undoing in another. Most western nations are overly dependent on fossil fuels. Insecticides have lead to less resistant crops, chemical food additives and preservatives are linked to a number of health concerns, and disinfectants have lead to more resilient strains of bacteria. So although humans have the intellectual capacity to develop technology, there are often unforeseen and unfortunate side effects. And our dependence on technology continues to make us vulnerable.

  Kant proposed that intelligence is neither good nor evil. It is more a question of either the general morality of the individual, or situational factors. It is the use to which intelligence is put, or lends itself to, that determines whether it is good or evil. And this may vary from one situation to another. Thus, an individual may use his or her intellectual prowess to help a friend in need of assistance, or use it to plot a heinous crime.

Intelligence Scales and Terms

Degrees of Mental Retardation			
Level of Retardation	IQ Scores	Percent of Population	Characteristics
Mild	50–70	80–85%	Usually able to become self-sufficient: may marry, have families, and secure full-time jobs in unskilled occupations.
Moderate	35–49	10–12%	Able to perform simple unskilled tasks; may contribute to a certain extent to their livelihood
Severe	20–34	4–7%	Able to follow daily routines, but with continual supervision; with training, may learn basic communication skills.
Profound	below 20	1%	Able to perform only the most rudimentary behaviors, such as walking, feeding themselves, and saying a few phrases.

stu·pid (st›"p¹d, sty›"-) *adj.* **stu·pid·er**, **stu·pid·est**. **1.** Slow to learn or understand; obtuse. **2.** Lacking or marked by a lack of intelligence. **3.** In a stupor; stupefied. **4.** In a dazed or stunned state. **5.** Pointless; worthless: *a stupid job.* **--stu·pid** *n.* A person regarded as stupid. [Latin *stupidus*, from *stup¶re*, to be stunned.] **--stu"pid·ly** *adv.* **--stu"pid·ness** *n.*

SYNONYMS: stupid, slow, dumb, dull, obtuse, dense. These adjectives mean lacking or marked by a lack of intellectual acuity. *Stupid,* the most inclusive, means wanting in intelligence: *Despite a lack of formal education, she was far from stupid. Slow* and *dumb* imply chronic sluggishness of perception, reaction, or understanding: *The school offers special tutorials for slow learners. It was dumb of him to say yes. Dull* suggests a lack of keenness of intellect: *"It is the dull man who is always sure"* (H.L. Mencken). *Obtuse* implies a lack of quickness, sensitivity, or perceptiveness: *At the time, I was too obtuse to grasp the true implications of her behavior. Dense* suggests impenetrability of mind: *The woman kept signaling that it was time to leave, but her escort was so dense that he just kept sitting there.*

id·i·ot (¹d"¶-…t) *n.* **1.** A foolish or stupid person. **2.** A person of profound mental retardation having a **mental age below three years** and generally being unable to learn connected speech or guard against common dangers. The term belongs to a classification system no longer in use and is now considered offensive. [Middle English, ignorant person, from Old French *idiote*, from Latin *idi½ta*, from Greek *idi½t¶s*, private person, layman, from *idios*, own, private. See **s(w)e-** below.]

cre·tin (kr¶t"n) *n.* **1.** A person afflicted with cretinism. **2.** *Slang.* An idiot. [French *crétin*, from French dialectal, deformed and mentally retarded person, from Vulgar Latin **christi³nus*, Christian, human being, poor fellow, from Latin *Chrºsti³nus*, Christian. See CHRISTIAN.] **--cre"tin·oid"** (-oid") *adj.* **--cre"tin·ous** (-…s) *adj.*

im·be·cile (¹m"b…-s¹l, -s…l) *n.* **1.** A stupid or silly person; a dolt. **2.** A person whose mental acumen is well below par. **3.** A person of moderate to severe mental retardation having a **mental age of from three to seven years** and generally being capable of some degree of communication and performance of simple tasks under supervision. The term belongs to a classification system no longer in use and is now considered offensive. **--also im·be·cil·ic** (¹m"b…-s¹l"¹k) *adj.* **1.** Stupid; silly. **2.** Well below par in mental acumen. [From obsolete French *imbécille*, weak, feeble, from Old French, from Latin *imb¶cillus* : *in-*, not; see IN-1 + possibly *bacillum*, staff, diminutive of *baculum*, rod; see **bak-** below.] **--im"be·cile·ly** *adv.*

mo·ron (môr"¼n", m½r"-) *n.* **1.** A person regarded as very stupid. **2.** *Psychology.* A person of mild mental retardation having a **mental age of from 7 to 12 years** and generally having communication and social skills enabling some degree of academic or vocational education. The term belongs to a classification system no longer in use and is now considered offensive. [From Greek *m½ron*, neuter of *m½ros*, stupid, foolish.] **--mo·ron"ic** (m…-r¼n"¹k, mô-) *adj.* **--mo·ron"i·cal·ly** *adv.* **--mo"ron"ism** or **mo·ron"i·ty** (m…-r¼n"¹-t¶, mô-) *n.*

ig·no·rance (¹g"n…r-…ns) *n.* The condition of being uneducated, unaware, or uninformed.

ig·no·ra·mus (¹g"n…-r³"m…s) *n., pl.* **ig·no·ra·mus·es**. An ignorant person. [New Latin *ign½r³mus*, a grand jury's endorsement upon a bill of indictment when evidence is deemed insufficient to send the case to a trial jury, from Latin, we do not know, first person pl. present tense of *ign½r³re*, to be ignorant. See IGNORE.]

ya·hoo (yä"h›, y³"-) *n., pl.* **ya·hoos**. A person regarded as crude or brutish. See Synonyms at **boor.** [From *Yahoo*, member of a race of brutes having human form in *Gulliver's Travels* by Jonathan Swift.] **--ya"hoo·ism** *n.*

boor (b‹r) *n.* **1.** A person with rude, clumsy manners and little refinement. **2.** A peasant. [Dutch *boer*, from Middle Dutch *gheboer*. See **bheu…-** below.]

   SYNONYMS: *boor, barbarian, churl, lout, vulgarian, yahoo.* The central meaning shared by these nouns is "an uncouth and uncultivated person": *tourists acting like boors; a barbarian on the loose in a museum; consideration wasted on a churl; is both a lout and a bully; married a parvenu vulgarian; a yahoo and a blowhard.*

in·tel·li·gence (¹n-tµl"…-j…ns) *n. Abbr.* **int., I 1.a.** The capacity to acquire and apply knowledge. **b.** The faculty of thought and reason. **c.** Superior powers of mind. See Synonyms at **mind. 2.a.** *Theology.* An intelligent, incorporeal being, especially an angel. **b. Intelligence**. *Christian Science.* The primal, eternal quality of God. **3.** Information; news. See Synonyms at **news. 4.a.** Secret information, especially about an actual or potential enemy. **b.** An agency, a staff, or an office employed in gathering such information. **c.** Espionage agents, organizations, and activities considered as a group: *"Intelligence is nothing if not an institutionalized black market in perishable commodities"* (John le Carré).

gen·ius (jen"y…s) *n., pl.* **gen·ius·es**. **1.a.** Extraordinary intellectual and creative power. **b.** A person of extraordinary intellect and talent: *"One is not born a genius, one becomes a genius"* (Simone de Beauvoir). **c.** A person who has an exceptionally **high intelligence quotient, typically above 140**. **2.a.** A strong natural talent, aptitude, or inclination: *has a genius for choosing the right words.* **b.** One who has such a talent or inclination: *a genius at diplomacy.* **3.** The prevailing spirit or distinctive character, as of a place, a person, or an era: *the genius of Elizabethan England.* **4.**, *pl.* **ge·ni·i** (j¶"n¶-°"). *Roman Mythology.* A tutelary deity or guardian spirit of a person or place. **5.** A person who has great influence over another. **6.** A jinni in Moslem mythology. [Middle English, guardian spirit, from Latin. See **gen…-** below.]

su·per gen·ius (soo-pur jen"y…s) *n., pl.* **super gen·ius·es**. **1.a.** Awesome intellectual and creative power, nearing the point of omnipotence. Simply brilliant. **b.** A person of awesome intellect and talent: *"I am not merely a genius, I'm a super genius"* (Wile E. Coyote). **c.** A person who has an exceptionally **high intelligence quotient, typically off the scale entirely**. **2.** Only a few exceptional individuals meet these criteria: Wile E. Coyote, Uncle J.R.

Development

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The majority of developmental theories in psychology are stage theories. The important point is not so much at what age a particular stage of development is reached, but that the stages follow a necessary sequential order. Often children will take longer than usual getting through one stage, only to later pass quickly through subsequent stages. However, the stages are followed in order, as each builds upon those preceding. Part of this has to do with simple physical development. Newborns are still firming up their muscles, honing their sensory capacities, and learning to coordinate their movements. As they mature they are more capable physically, and become more confident emotionally. Children also are capable of dealing with increasing complexities (social and cognitive) as they grow older. Nurturing, affection, and security are necessary to proper social development. Maturation and experience result in changes in the reasoning capacity of the brain. There are especially influential changes that take place after puberty due to hormonal influences on the brain. The adult brain is better equipped to deal with abstract concepts than the brain of a child. This is why I.Q. measures don't really stabilize until around age 16. It is only after puberty that the full potential of the brain, in its adult form, is obtained.

The **germinal period** begins with conception, when the sperm from the male unites with the egg from the female (**Figure 4.3a**). This union creates the zygote, the first cell of a new life. The zygote begins to divide rapidly into 2 cells, then 4 cells, then 8 cells, and so on (**Figure 4.4a**). A placenta begins to form to nourish and protect these cells. Just 7 or 8 days after fertilization, implantation occurs in the uterine wall, and the next stage of development begins. If any abnormalities occur during this earliest stage of development, the result is usually a miscarriage before the woman even knows she is pregnant.

(a)   (b)   (c)

FIGURE 4.3
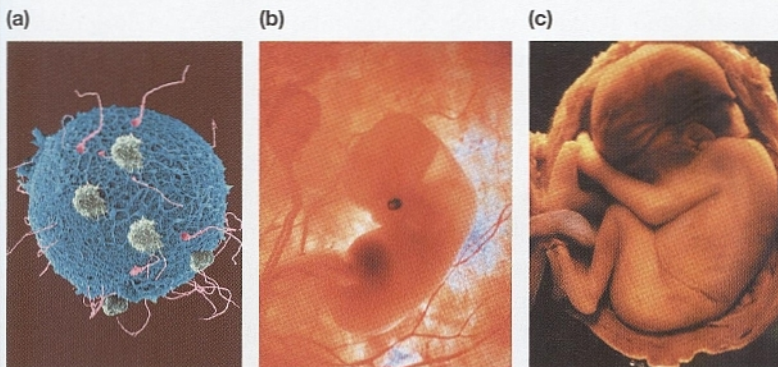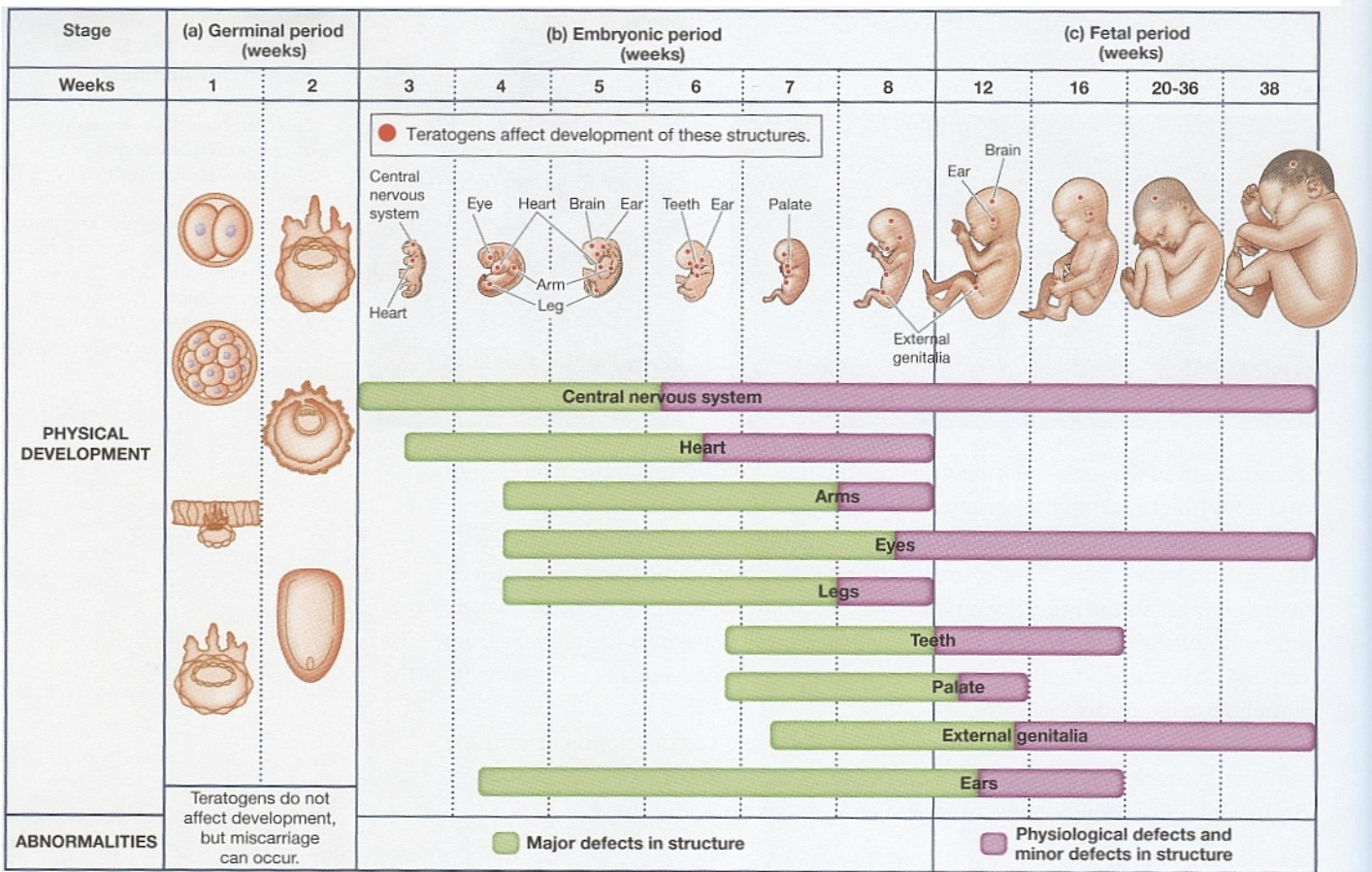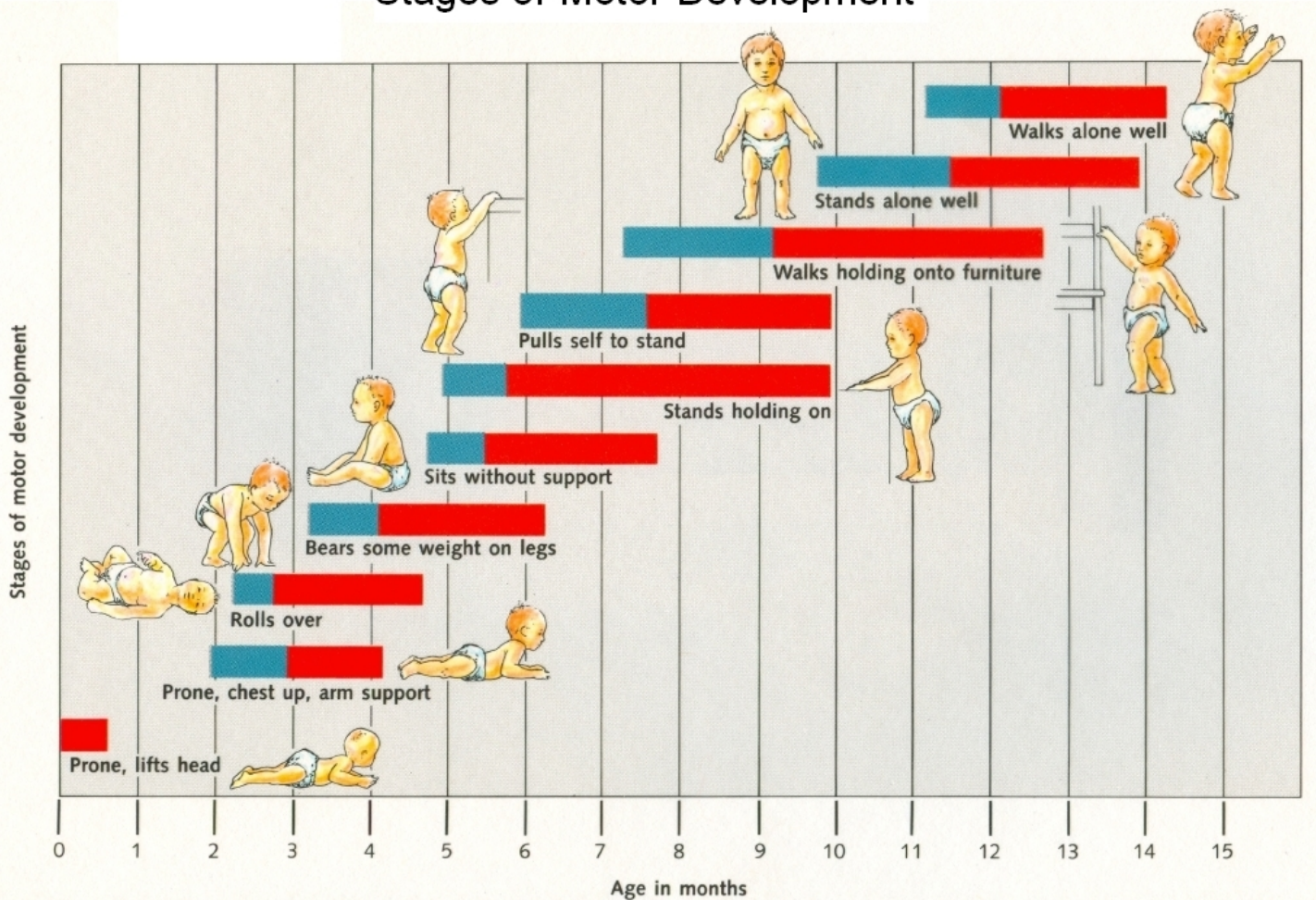**Development in the Womb**
(a) In the germinal period, the union of egg and sperm forms a zygote that implants in the uterine wall within 2 weeks. **(b)** In the embryonic period, the organs develop in the embryo. **(c)** The fetal period, from 2 months until birth, is a time of tremendous physical growth and brain development that prepares the baby to survive outside the womb.

Stage	(a) Germinal period (weeks)		(b) Embryonic period (weeks)						(c) Fetal period (weeks)			
Weeks	1	2	3	4	5	6	7	8	12	16	20-36	38

● Teratogens affect development of these structures.

Central nervous system — Eye — Heart — Brain — Ear — Teeth — Ear — Palate — Arm — Leg — Heart — Brain — Ear — External genitalia

PHYSICAL DEVELOPMENT

Central nervous system
Heart
Arms
Eyes
Legs
Teeth
Palate
External genitalia
Ears

ABNORMALITIES — Teratogens do not affect development, but miscarriage can occur.

■ Major defects in structure   ■ Physiological defects and minor defects in structure

Stages of Motor Development

Walks alone well
Stands alone well
Walks holding onto furniture
Pulls self to stand
Stands holding on
Sits without support
Bears some weight on legs
Rolls over
Prone, chest up, arm support
Prone, lifts head

Stages of motor development

Age in months

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

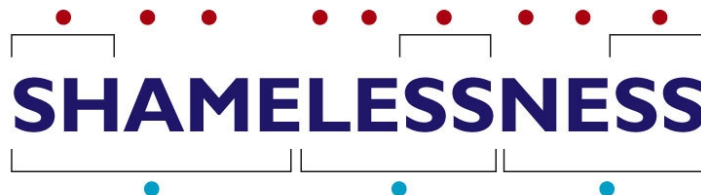**Language Development:** Human children readily acquire language. Recall that Chompsky and others proposed that we may be genetically endowed with the capacity for language, a built in Language Acquisition Device (LAD) within the brain. This lets us pick up on such things as the appropriate phonemes, surface structure, relational phrases, and other elements of a language. We do so relatively easily, especially during a critical time period in early childhood. And our learning of language is far too rapid to be due to trial and error, it also seems to go beyond mere imitation. The first stage is to recognize the unique sounds of one's native language, which are called phonemes. Initially children are capable of producing approximately 70 different vocalizations. As they babble their primary caregivers tend to pay more attention to those sounds that are part of the native language. These are repeated more often, while those that are not part of the language drop out of the repertoire. From there they learn which combinations convey aspects of meaning, morphemes being the basic components of language. From there they begin to acquire a vocabulary. As language development continues children extract the surface structure rules of grammar and syntax.

Phonemes
(units of sound):

SHAMELESSNESS

Morphemes
(units of meaning):
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Sentences
Example:
*Stephanie **ask**ed for some milk.*

Phrases
Example:
asked for some milk

Words
Example:
asked

Morphemes
Examples:
ask, ed

Phonemes
Examples:
/a/, /s/, /k/, /t/

babbling
Intentional vocalization, often by an infant, that does not have a specific meaning.

telegraphic speech
The tendency for toddlers to speak by combining basic words in a logical syntax, but not a complete sentence, to convey a wealth of meaning.

overregularization
The tendency for young children to incorrectly use a regular grammar rule where they should use an exception to the rule.
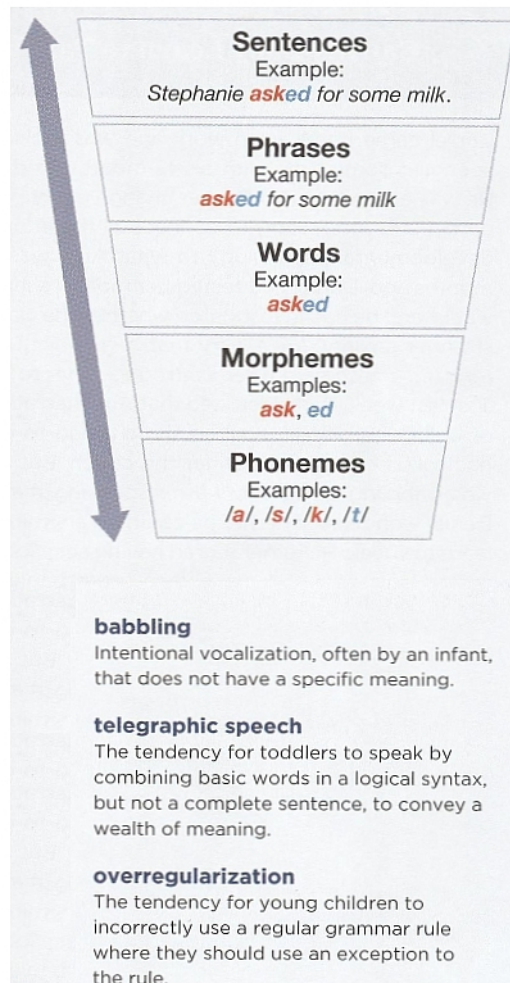
TABLE 8.2 Stages of Language Development

Age	Typical Language Abilities (Much Individual Variation)
3 months	Random vocalizations.
6 months	More distinct babbling.
1 year	Babbling that resembles the typical sounds of the family's language; probably one or more words including "mama"; language comprehension much better than production.
1½ years	Can say some words (mean about 50), mostly nouns; few or no phrases.
2 years	Speaks in two-word phrases.
2½ years	Longer phrases and short sentences with some errors and unusual constructions. Can understand much more.
3 years	Vocabulary near 1,000 words; longer sentences with fewer errors.
4 years	Close to adult speech competence.

Freud's Theory of Psychosexual Development: Freud was one of the first to realize the importance of childhood experience, and the impact it has on later life. The prevailing wisdom of the past was that most of one's childhood is forgotten, so how could it have any effect. It was also the case that parents tried to not get overly attached to their newborn offspring. Infant mortality was high, so it was better to not get overly invested emotionally until the child made it through the first few years. This is also why there were larger families, as there was a real need for 'spares'. Freud's theories recognized the importance of those early years and changed the way we look at childhood experience.

   Freud believed sexuality to be a major force in all aspects of human functioning, and that it played a major role in development. His theory is based on the sexual stimulation children derive from different sources over the course of development. At each stage the primary focus shifts from one principle source of sexual (sensual) stimulation to another. Problems, such as inadequate satisfaction, during any one of these stages can result in fixation. Fixation results in the individual continuing to seek gratification related to that stage of development, and that source of sexual stimulation, throughout adult life. However, the manifestations of these fixations may appear to be rather far removed from actual sexual stimulation.

   In the context of Freud's theory the anal stage is of particular importance. This is when toilet training takes place, so the focus is on that area as it is the source of attention for both baby and parents. But this is the first time that the wishes of the child and those of the parents come into conflict. Before this baby could do no wrong. Now baby wants to eliminate when and where he or she pleases, but the parents only want baby to do it on the toilet. If handled badly this can become an epic battle of the wills. Fixation can lead to later problems with authority, excessive preoccupation with cleanliness, or excessive sloppiness and disorder. So it is important that the child be old enough to deal with the situation, and properly encouraged to cooperate. Mistakes made by parents during the phallic stage can also be serious for later development. At this stage children often play with their genitalia. Parents that are overly severe dealing with this are especially likely to generate a number of sexual problems in the child's later adult life. The child may grow up to be sexually repressed, or sexually deviant.
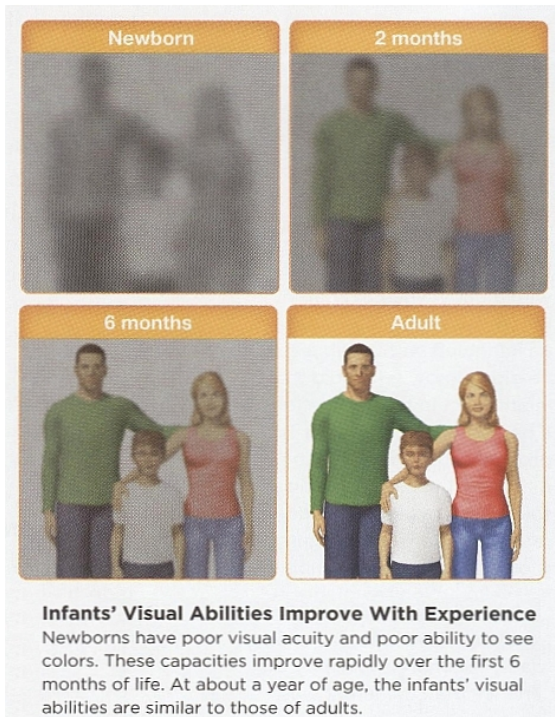
Freud's Stages of Psychosexual Development

Stage	Approximate Age	Erogenous Zone	Key Conflict or Developmental Task	Healthy Personality	Maladaptive Personality
Oral	0–18 months	Mouth	Weaning (from breast or bottle)	Participation in sexual relationships only on lustful desire, not on respect and commitment	
Anal	18 months–3	Anus	Toilet training		
Phallic	3–6	Genitals	Overcoming the Oedipal complex (by identifying with same-sex parent)	Development of a value system inconsistent with society	
Latency	6–puberty	None	Interacting with same-sex peers	Development of anal retentive or anal sadistic personality characteristics	
Genital	Puberty to adult	Genitals	Establishing intimate relationships with the opposite sex	Development of oral incorporative or oral aggressive/sadistic personality characteristics	

Personality Development

Regression or Fixation

Development of Self-Control: At some point children learn to delay gratification, forgoing a small immediate reward in favor of a larger reward later. The Marshmallow Experiment, wherein a small child is given the option of eating a single marshmallow or waiting 10-15 minutes in order to get two of them, exemplifies this capacity. Those capable of this kind of self-control at 4-5 years of age have been found to do better in school, are more likely to go to college, eventually get better jobs, and have more stable adult relationships than those who couldn't wait.

During the 1920s and 30s John Watson wrote extensively on child development. In its time his book, *Psychological Care of infant and Child* (1928), was quite influential as a guide to parents. One of the things he promoted was fostering the development of the child's capacity for self-control. He believed that parents should give children the opportunity to make decisions for themselves, including poor decisions. So when a child insists on having a candy bar right now while in the grocery store give him or her a choice between that versus having ice cream with the family after dinner that night. If the child chooses the candy bar let him or her have it. But when the family goes out for ice cream later that night, remind him or her that they had to have that candy bar earlier so now they aren't going to get any ice cream. No doubt the child will be upset, but the child will also learn the value of foregoing a small immediate reward in favor of a larger one later. And better they should learn it from parents early on rather than once they enter into the world on their own.
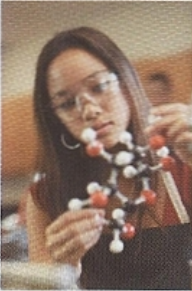
Piaget's Theory of Cognitive Development: Piaget focused on the child's increasing cognitive capacities over the course of development. Simply put, children become better thinkers over time. They are capable of grasping ever more complex concepts as they mature.

Infants' Visual Abilities Improve With Experience
Newborns have poor visual acuity and poor ability to see colors. These capacities improve rapidly over the first 6 months of life. At about a year of age, the infants' visual abilities are similar to those of adults.

Babies Are Born Able to See High Contrast

Table 8.4	PIAGET'S FOUR STAGES OF COGNITIVE DEVELOPMENT
Birth to 2 years	**SENSORIMOTOR** ABILITIES—Uses senses and motor skills to explore and develop cognitively. LIMITS—Beginning of stage lacks *object permanence* (understanding things continue to exist even when not seen, heard, or felt).
Ages 2–7	**PREOPERATIONAL** ABILITIES—Has significant language and thinks symbolically. LIMITS: • Cannot perform "operations." • *Egocentric* thinking (inability to consider another's point of view). • *Animistic* thinking (believing all things are living).
Ages 7–11	**CONCRETE OPERATIONAL** ABILITIES: • Can perform "operation" on concrete objects. • Understands *conservation* (realizing thoughts and changes in shape or appearance can be reversed). LIMITS—Cannot think abstractly and hypothetically.
Ages 11 and up	**FORMAL OPERATIONAL** ABILITIES—Can think abstractly and hypothetically. LIMITS—*Adolescent egocentrism* at the beginning of this stage, with related problems of the *personal fable and imaginary audience.*

Piaget's Four Stages of Cognitive Development

| Stage	Characteristics
1 Sensorimotor (birth–2 years)	• Starts to mentally represent information acquired through the senses and motor exploration. • Begins to act intentionally—for example, pulls a string to set a mobile in motion or shakes a rattle to make a noise. • Achieves object permanence by realizing that things continue to exist even when no longer present to the senses.
2 Preoperational (2–7 years)	• Learns to use language and to represent objects by images and words. • Thinking is egocentric, where the child has difficulty taking the viewpoint of others. • Can think intuitively, not logically. • Classifies objects by a single feature—for example, groups blocks by color regardless of their shape.
3 Concrete operational (7–12 years)	• Can think logically about concrete objects and events. • Achieves conservation of number, volume, mass, and weight. • Flexibly classifies objects by several features and can order them in a series along a single dimension, such as size.
4 Formal operational (12 years and up)	• Can think logically about abstract propositions and test hypotheses systematically. • Becomes concerned with hypothetical issues, the future, and ideological problems.

Assimilation and Accommodation

Assimilation

Correctly add information to schema of "BIRDS":
- They have wings.
- They fly.

"Is it a bird?"
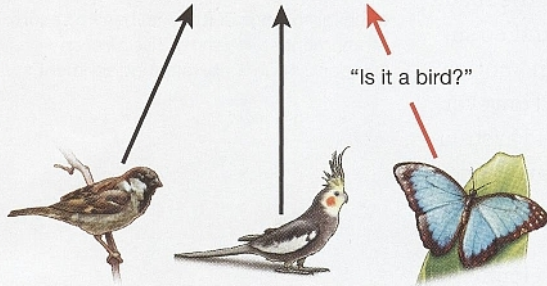
Accommodation

Update schema of "BIRDS" to include new information:
- They have wings.
- They fly.
- They have beaks.

"No, it's not a bird."

Accommodation

Create new schema of "FLYING ANIMALS":
- They have wings.
- They fly.
- But they don't have beaks.

"It's another type of flying animal."

assimilation
The process we use to incorporate new information into existing schemas (mental representations).

accommodation
The process we use to create new schemas (mental representations) or drastically alter existing ones to incorporate new information that otherwise would not fit.

Concrete Operations: The Test for Conservation of Volume

Two glasses are filled with the same amount of water. The child sees that they contain an equal amount.

The water of one glass is poured into a tall glass. The child is asked whether each glass contains the same amount of water.

Erikson's Psychosocial Development: Erikson believed development does not stop once we reach adulthood. He proposed that we face a number of crucial trails over the entire lifespan. We need to address and resolve the relevant issues at each juncture. And so we make life altering decisions at each of these points. These decisions subsequently alter our characters from that point onward.

Erikson's Eight Stages of Psychosocial Development

STAGE	AGE	MAJOR PSYCHOSOCIAL CRISIS	SUCCESSFUL RESOLUTION OF CRISIS
1. Infancy	0–2	Trust versus mistrust	Children learn that the world is safe and that people are loving and reliable.
2. Toddler	2–3	Autonomy versus shame and doubt	Encouraged to explore the environment, children gain feelings of independence and positive self-esteem.
3. Preschool	4–6	Initiative versus guilt	Children develop a sense of purpose by taking on responsibilities, but they also develop the capacity to feel guilty for misdeeds.
4. Childhood	7–12	Industry versus inferiority	By working successfully with others and assessing how others view them, children learn to feel competent.
5. Adolescence	13–19	Identity versus role confusion	By exploring different social roles, adolescents develop a sense of identity.
6. Young adulthood	20s	Intimacy versus isolation	Young adults gain the ability to commit to long-term relationships.
7. Middle adulthood	30s to 50s	Generativity versus stagnation	Adults gain a sense that they are leaving behind a positive legacy and caring for future generations.
8. Old age	60s and beyond	Integrity versus despair	Older adults feel a sense of satisfaction that they have lived a good life and developed wisdom.

SOURCE: Erikson (1959).

Kohlberg's Theory of Moral Development: The reasons people give for their moral choices change systematically and consistently with age. This reflects changes in the reasoning capacity of the brain, especially changes that take place after puberty due to hormonal influences on the brain.

Pre-conventional Level - Birth to Age 9: Moral reasoning is not yet based on the conventions and rules of society.

  Stage 1: Moral decisions are based solely on avoiding punishment.
  Stage 2: Morality is based on personal self-interest and advantage.
             Focus is on bargaining and fair exchanges.

Conventional Level - Age 9 to Age 15: Moral reasoning reflects belief in social conventions, rules, and laws.

  Stage 3: Morality centered around conforming to the standards and
             expectations of significant others (family and friends) in
             order to get approval.
  Stage 4: Law and order mentality governs moral choices. Conformity
             marked by strict adherence to the rules, codes, and laws of society.
             Duty and honor requiring moral absolutes, following the 'letter
             of the law'. There is a black and white orientation wherein
             something is either right or wrong with no room for interpretation.
             Everyone must follow the law, without exception, or society could
             collapse. Many never progress beyond this stage.

Post-conventional Level - Age 15 Onward: Moral reasoning based on personal standards and universal principles of justice, equality, human rights.

  Stage 5: Social contract morality. Concern with social standing and the
             role one plays. One acknowledges the impact of personal decisions
             on the society as a whole. Also, one's choices must be considered
             with respect to the welfare of others and the context of the situation.
             Realization that rules and laws may have limits, that extreme cases
             may be exceptions, and that some principles outweigh others.
             Understanding that laws are subject to interpretation.
  Stage 6: Development of personal ethic based on individual conscience.
             Personal morality based on universal principles of equality,
             reciprocity, justice, and respect for human rights. Realization
             that rules and laws are arbitrary, though they protect human welfare
             overall. Moral decisions are based on analysis of alternatives after
             examining the problem from different perspectives. One seeks to
             find a balance between human rights and the laws of society.
             Few reach this stage.

JR's Eclectic Combined Theory of Development: Each of these theories has something to offer. There's no reason to limit ourselves to just one perspective. Ultimately the best approach is to take the best elements from each of these theories and combine them to make one all encompassing theory.

Eclectic Combined Theory of Development

Piaget's Sensorimotor: Birth to 2 Years.
  • Refines visual acuity. Visual contrast is important to this (black on yellow).
  • Learns defining properties of objects - Edges, points of intersection, prototypical
   arrangements (e.g. facial features).
  • Hand and eye coordination - Can move toward and touch visual objects.
  • Develops motor skills - Reaching, rolling over, crawling, standing, walking.
  • Eventual development of object permanence.
  • Native language phonemes strengthened by reinforcement, others drop out of repertoire.

Freud's Anal Stage: 18 months to 3 years.
  • Toilet training - Child's desires come into conflict with parents' desires.

Piaget's Preoperational: 2 to 7 years.
  • Language development - Internalize rules of syntax.
  • Egocentric thought - Inability to consider another's point of view.
  • Animistic - Attributing feelings, thoughts, intentions, and motivation to inanimate objects.
  • Logic based upon images, mental symbolism.
  • Mental fantasy and play.

Development of Self-Control: 4 to 5 years.
  • Demonstrates the capacity to delay gratification, forgoing a small immediate reward in favor of a larger
   reward later.

Piaget's Concrete Operations: 7 to 11 years.
  • Conservation - Transformation of form does not alter quantity, area, or volume.
  • Beginning logic - Relations between objects, mental transformations, mental rotation,
   and reorganization of object categories.
  • Basic arithmetic (add, subtract, multiply, divide, fractions).

Puberty: 10 to 14 years.
  • Gender identity and gender roles.
  • Transfer from protected role of child to responsible role of young adult.
  • Major changes in family roles.
  • Major changes in peer relations, power of peer pressure.

Piaget's Formal Operations: 11 years and beyond.
  • Abstract thought and logic - Can grasp hypothetical concepts (objects, situations).
  • Symbolic logic, argument, higher mathematics (factoring, exponents, roots, algebra,
   geometric proofs, calculus, probability, statistics).

Kohlberg's Law and Order Morality: 15 years.
  • Black and white orientation.
  • Strict adherence to rules, codes, duty, and honor.
  • Moral absolutes.

Erikson's Young Adulthood: 20 to 30 years.
  • Decision between intimacy and commitment versus solitary life and emphasis on
   personal goals, ambitions, and advancement.

Kohlberg's Social Contract Morality: Young to Middle Adulthood, If At All.
• Concern with role in society, social standing, larger impact of personal decisions.
• Greater pragmatism, welfare of others, context of moral decisions.

Erikson's Adulthood: 30 to 70 years.
• Generative versus stagnant life styles
• Generative - Nurture children, devotion to career, works for greater common good, is a
  productive member of society. Develops social ties to others and community.
• Stagnation - Increasing isolation, self-centered, inactivity.

Kohlberg's Universal Ethics: Later Adulthood, If At All.
• Develop personal standards and individual conscience.
• Kant's conception of categorical imperative with respect to universal law.
• Mill's conception of utilitarianism with respect to value of higher pleasures.
• Sartre's conception of forming and choosing one's own standard of conduct.

Erikson's Mature Individual: 70 years and beyond.
• Period of reflection.
• Face death with integrity, acceptance, and dignity knowing life had meaning versus
  despair and regret from unaccomplished goals and poor decisions.

Death: End of Life.
• Fear of the unknown.
• Vain attempts at redemption trying to compensate for a life of greed and selfishness.
• According to Freud, the final release from all tension and conflict - Reason for risk taking,
  destructive behavior, war.
• Religious conceptions of peace, enlightenment, transcendent realities.

Personality

Personality, like intelligence, is an abstract and intangible concept. Overall the study of personality has never been particularly exact. More often than not it has been based on inference and speculation. Personality refers to the notion that each individual has a consistent pattern of social behaviors and that that pattern differs from those exhibited by others. We describe personality as a set of characteristic feelings, behaviors, and thoughts that a person consistently exhibits across a wide variety of situations. Personality is what defines us, and separates us from others. However, it's difficult to isolate the particulars. What exactly is it that makes some people likable and others less so? And what makes the same behavior a desirable quality in some and undesirable in others? For example, constant questioning and making suggestions for improvement can result in a person being perceived as helpful and supportive or as critical and irritating. One may argue it's all in how it's done, but what defines that? And as for consistency, social psychology has found that people often act in ways incongruent with their overall personalities in certain situations. Beyond that, what about personality changes? Some people display radical mood swings, so their reactions may be quite unpredictable. So which reflects their true personality, their good moods or their bad moods? And then there are those that undergo rather permanent and drastic changes in personality. For example, a person who is predominately angry and violent, who tends to lash out at the slightest provocation, may change. An anger management class that teaches how to deal with issues regarding anger and rage, finding solace in religion, or entering into a relationship with a loving and supportive person all may result in a transformation. So although personality can be rather consistent in some individuals, it should be regarded as a dynamic rather than a static entity.

Personality has always been of interest to people. We want to be able to understand what makes people act in the ways that they do, and personality seems to play a major part in that. So a number of theories have been proposed as to what determines personality.

Theory of bodily humors: An early theory of personality, the idea was that a preponderance of one of the four bodily fluids would manifest itself in specific personality traits. This theory was elaborated and spelled out by the physician Galen (130-200 A.D.) during the early roman empire. The four principle fluids and their associated personality characteristics were as follows:

  Blood - Warm, red, sweet and so associated with best of human qualities including courage, generosity, cheerful, overall good nature.

  Phlegm - Mucous, snot, lymph fluid (burns), and sweat which are essentially cold, colorless, and odorless. Associated with qualities such as being apathetic, unemotional, aloof, cold, and uncaring.

  Yellow Bile - Urine, vomit, and other digestive enzymes which are yellow/orange, acidic, and caustic. Associated with qualities such as impulsivity, irritability, overly aggressive or competitive, combative, nasty, and quick-tempered.

  Black Bile - Diarrhea which is dark in color and smells of rot, putridity, and decay. Reminds one of death and decay because of smell. Associated with regret, remorse, sadness, melancholy, and depression.

  Now by today's standards this theory seems rather preposterous, yet it was the predominate theory of personality for well over 1,000 years. Part of this may be attributed to the fact that it inspired physical treatments such as blood-letting and various forms of purging based on the assumption of excess fluids. These unpleasant treatments lead to patients claiming improvement (if they survived), thus providing evidence that the theory must be correct. Also consider the fact that a number of personality disorders can be traced to a deficiency or excess of particular neurotransmitters or hormones, which are bodily fluids.

Psychodynamic Theories: Sigmund Freud (1856-1939) described personality as the interplay of conflicting forces within the individual, including some forces that the individual may not consciously acknowledge. Freud emphasized people's sexual motivations. Other psychodynamic theories were later developed. Carl Jung emphasized a cultural unconscious influence. Alfred Adler emphasized ambitions, and a striving for success or superiority. All agree that there are both conscious and unconscious aspects to personality and that these are often in conflict. It is these conflicting forces that motivate behavior, but we are often unaware of their influence. A common metaphor for these theories is an iceberg. The one eighth of an iceberg that lies above the water that we can plainly see represents the *conscious mind*. The part visible just below the surface represents the *preconscious mind*, those things that are not currently conscious but can come into consciousness.

The vast majority of the iceberg that lies well below the surface represents the *unconscious mind*, all the memories, thoughts, feelings, and urges that we are wholly unaware of. According to psychodynamic theories the unconscious mind is what drives behavior.
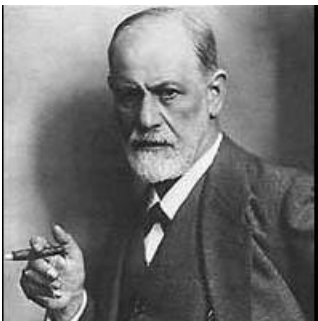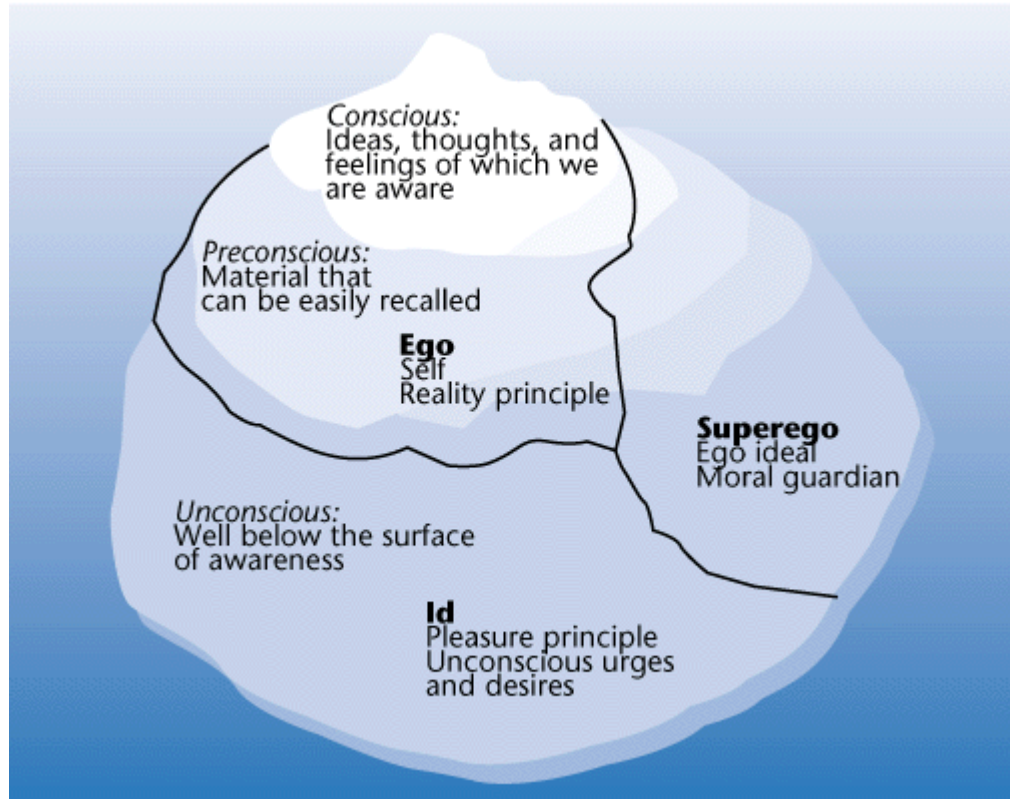
Sigmund Freud based his theory on the results he obtained from the psychoanalysis of his patients. He made inferences from patient reports of dreams, physical symptoms, and so forth. He also relied on his own experiences as a basis of theory. Freud proposed that there were three aspects of personality. The *id* consists of our biological drives; the *ego* is the rational, decision-making part of personality; and the *superego* acts as a kind of conscience, containing the memory of our parents' rules and prohibitions. This conception is quite similar to Plato's conception of the tripartite nature of the soul, from which Freud probably got the idea. According to Freud the id is fueled by *libido*, sexual energy ultimately based on the biological need to procreate, the basic life force. But libido can manifest itself in various ways that result in our deriving sexual (or sensual) stimulation in a multitude of ways. For Freud all of our behaviors, and the motivations for them, are tied to libido. The superego represents the internalization of the moral codes imposed by society. Freud believed that there was constant conflict between these two forces with the id struggling for satisfaction while the superego strived for propriety. Most of this occurred unconsciously. Caught in the middle was the ego, which represents our conscious selves constantly seeking a balance between satisfying the demands of the id in ways acceptable to the superego. It is important to remember that Freud was a product of his times. The first half of his life was spent in Victorian era Europe. During this time there was a great deal of sexual repression pervading all aspects of society. This was when the terms white meat and dark meat for fowl were introduced because it was deemed improper to refer to breasts and thighs. In the English countryside wives were covering up the piano legs because the curves were considered to be too provocative. But there was also a great deal of inconsistency, so in London prostitutes were estimated to outnumber men by as much as three to one. So sexuality, or the repression of it, was a dominate force in that society.

The majority of Freud's patients were upper middle-class women suffering from various forms of what was called hysteria. He used hypnosis, dream analysis, and free association (a technique he developed) to delve into their unconscious conflicts and motivations. He believed much of what he uncovered could be understood in terms of symbolic representation. And much of the interpretation involved his own inferences, often driven by his preconceived theoretical ideas of what was going on. Since he believed the unconscious motivates much of

our behavior he also examined slips of the tongue, or "*Freudian slips,*" on the assumption that they can help to reveal unconscious thoughts and motivations.

Freud believed sexually based influences shaped the development of personality. Over the course of development libido focuses on different parts of the body, referred to as *erogenous zones*. Freud used the term *psychosexual pleasure* to include any pleasure or excitement arising from any channel of bodily stimulation. And this is also extended to sexual fantasies associated with any of these channels of stimulation. This is the basis of his psychosexual theory of development. Recall the stages discussed earlier pertaining to developmental theories: During the *oral stage* infants derive intense psychosexual pleasure from stimulation of the mouth, particularly while breastfeeding. While children are in the *anal stage*, when they get psychosexual pleasure from controlling or not controlling their bowel movements (as the case may be). It is during the *phallic stage* that children begin to experience pleasure from playing with their genitals. At this time that boys experience an *Oedipus complex*, in which a sexual interest develops toward the mother, mixed with aggression toward the father. Freud believed that it is essential for boys to successfully deal with this dilemma by coming to identify with the father. This part of his theory may stem from his own childhood, given the disparate difference in age between his father and mother, and his father's authoritarian behavior. Freud also proposed that an analogous situation occurred with girls, which he called the Electra complex, but never really elaborated fully. During the ensuing latent period sexual interest is suppressed and same-sex interaction predominates in the social world of the child. This is when the child fully adopts the gender role appropriate to his or her sex as determined by the prevailing cultural norms. The *genital stage* begins in puberty, and is characterized by taking a sexual interest in other people.

The way we deal with psychosexual development is critical in determining our personality. If normal sexual development is blocked at any stage, the libido becomes *fixated* at that stage and continues to be preoccupied with the pleasure area associated with that stage. Excessive talking, overeating, heavy drinking, and/or smoking manifest oral fixation. Anal fixation is manifested by excessive neatness, often bordering on obsessive-compulsive behavior, or sloppiness and disorder. Fixation at the phallic stage can lead to fear of castration (in boys) or penis envy (in girls). It is implicated in a preoccupation with sex, excessive masturbation, promiscuity, and exhibitionism. Freud believed male homosexuality resulted from a failure to properly resolve the Oedipus complex by identifying with the father. Successfully passing through the latent stage and reaching the subsequent genital stage results in achieving a normal level of satisfaction from heterosexual intercourse (whatever that means).

The result of all of this is that we are driven by sexually based impulses based upon the course of our psychosexual development, which the id wants satisfied regardless of consequence. However, many of these urges and impulses are repugnant to the superego as they are contrary to accepted social behavior. To deal with the discrepancy the ego uses *defense mechanisms* for protection against conflicts and anxieties by relegating unpleasant or unacceptable thoughts and impulses to the unconscious. Freud elaborated on a number of these defense mechanisms:

Repression – A central concept in Freud's theory and the most basic defense mechanism. Repression could be defined as motivated forgetting. Unacceptable or traumatic thoughts, feelings, or events are pushed aside and "repressed" into the unconscious. Consciously the individual is totally unaware of those thoughts, feelings, or events to the extent that they are unaware that they ever existed.

Denial - The refusal to believe any information about the situation or one's behavior and feelings that provoke anxiety. Our perception of reality is altered to protect us from the anxiety it might create. Even when confronted, the individual simply refuses to accept that the feelings or behavior ever happened. How often have you had to deal with someone who absolutely refuses to admit something they said or did?

Compartmentalization – Contradictory impulses and feelings are assigned to separate different areas of the mind so as to avoid conflict. We don't allow ourselves to acknowledge the discrepancies. We actively avoid making connections between opposing positions we may hold, and seldom (if ever) think about them at the same time. And so an individual can harbor vastly different views on related issues. Thus we have celebrities promoting research to cure AIDS, yet opposing the animal research that finding such a cure depends upon. This is related to the concept of cognitive dissonance discussed by social psychologists.

Intellectualization – One ignores the emotionally charged and anxiety provoking aspects of a situation by becoming coldly unattached and focusing on the more abstract elements. For example, when a relationship breaks up one ignores (or blocks out) the emotional pain by logically assessing the reasons for the breakup and the pros and cons of being single again.

Rationalization - This is a strategy wherein people attempt to prove that their actions are rational, justifiable, and acceptable using whatever convoluted logic is necessary. For example, smokers often rationalize by noting that they may be killed by any number of accidents or other misfortunes before the long-term effects of smoking ever strike and that it's important to enjoy life to the fullest right now. This is also related to the concept of cognitive dissonance discussed by social psychologists.

Displacement – This involves re-channeling a behavior, thought or feeling away from its actual target toward a less threatening target. For instance we may vent anger at non-threatening people and objects rather than the true source of our rage. And so your boss yells at you, you yell at your spouse, your spouse yells at the children, the children yell at the dog, and the dog pees on the cat.

Regression - This refers to a resumption of behaviors, thoughts or feelings related to a more juvenile level of functioning. It reflects the stage of psychosexual development in which the individual felt most comfortable and secure. So people reprise those behaviors that seemed to work best in the past. That's why adults often cry or throw tantrums to get their way, just as they did in childhood. These kinds of behaviors often occur as a result of frustration, when all other avenues have been unsuccessful.

Projection – This is when we attribution our own undesirable characteristics (faults, unacceptable desires or attitudes) to other people rather than admitting them in ourselves. This may well operate in conjunction with repression or denial. Hence the phrase, 'I don't have a problem, you do.' So rather than admitting you're being stubborn you accuse the person you're arguing with of being stubborn.

Reaction Formation - This is when people present themselves as the opposite of what they really are. If you believe you have an unacceptable thought or feeling you vehemently state or act as if you don't. This often results in lashing out at those who do hold those beliefs to prove that you do not. It has been suggested that a lot of gay bashing is due to latent homosexual feelings on the part of those doing the attacking.
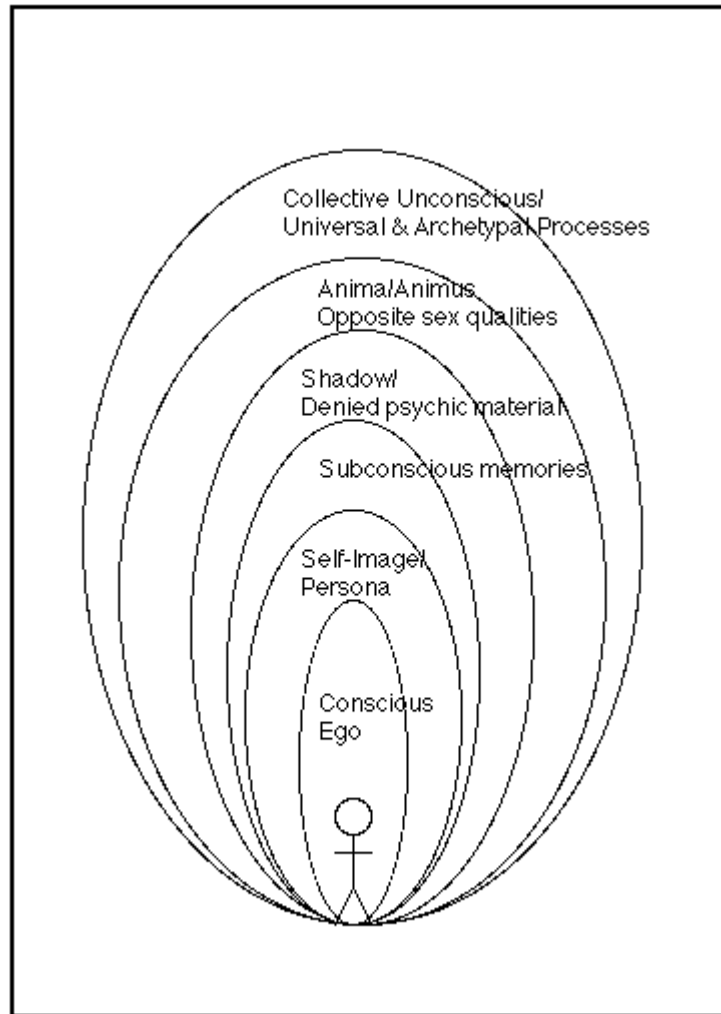
Sublimation – This strategy involves the transformation or channeling of an unacceptable impulse into an acceptable or constructive form of behavior. The psychic energy is redirected and transferred to acceptable forms of behavior allowing for partial release of tension and some measure of satisfaction. According to Freud a great deal of art and architecture is the result of sublimation. Rather than admit a preoccupation with sex, those impulses are channeled into creative rather than procreative endeavors. And so artists paint nudes, and architects design tall buildings and tunnels.

However, these defense mechanisms are imperfect solutions that also require great amounts of *psychic energy* to maintain. Ultimately some form of release must occur or the building tensions may become unbearable and lead to some sort of dysfunction. According to Freud a process he called *catharsis* alleviates our pent-up emotional tensions by allowing us at least partial expression of our unacceptable impulses. And so rather than engaging in violent behavior we drive aggressively and flip people off at the slightest provocation, or we watch football and action movies letting others behave violently for us. This provides partial release and acts as a safety valve to prevent us from reaching a critical level of internal tension.

Overall, the Freudian approach is more myth than science. From the very beginning it was based upon inference and speculation rather than empirical investigation. Even so far as Freud's theories are based on a nativistic approach to deriving truth and knowledge there are problems. The logic behind many of his claims is often convoluted, sometimes circular. And at times his theories tend to be self-contradictory. Yet his theory has yielded some useful and enduring contributions. The unconscious aspects of mental life, conflicting or unacceptable motives, the role of childhood experiences in personality development, the re-emergence of childhood themes in later relationships, and the importance of sexuality in development and adjustment all retain their utility in the work of clinical psychologists.

[Carl G. Jung](#) was originally associated with Freud, but then their ideas diverged. Although Jung's theory incorporated many of Freud's ideas, he placed less emphasis on sexual motivations and greater influence on people's search for spiritual meaning in life. Jung proposed that the structure of personality is quite complex, with a number of different layers all having a certain influence. There is the conscious ego, our everyday self, known to us and to others. Beyond that is the persona, which represents the idealized version of one's self-image known only by the individual. He that we all have a dark side, which he referred to as the shadow, comprised of all the denied and unacceptable thoughts, feelings, desires, and impulses buried within us. Each of us also has both masculine and feminine qualities (the animus and anima, respectively). The masculine side motivates things like competitive behavior while the feminine side motivates things like nurturing behavior. His conception of the *collective unconscious* refers to the cumulative experience of preceding generations of
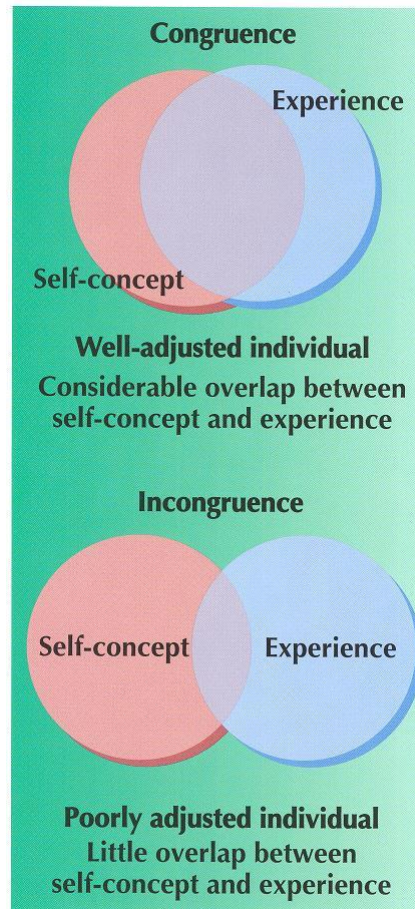
humanity. The collective unconscious contains *archetypes*, which are images and themes that we all inherit from the experiences of our ancestors. These images are cross-cultural and virtually universal. Jung found many of these archetypes reflected in alchemy and mysticism, which he researched extensively.

Collective Unconscious/
Universal & Archetypal Processes

Anima/Animus
Opposite sex qualities

Shadow/
Denied psychic material

Subconscious memories

Self-Image/
Persona

Conscious
Ego

Humanistic Psychology: The focus here is on the individual's struggle to reach his or her full potential. Humanistic psychology emerged as a protest against the deterministic and reductionistic approaches of psychoanalysis and behaviorism. Humanistic psychologists believe that people make conscious decisions about what to do with their lives, and what they want to ultimately achieve. They seldom conduct traditional scientific research, instead relying on studies of unique individuals and unique experiences. Of special interest are *peak experiences*, the moments in life when a person feels truly fulfilled, content, and at peace.

   Alfred Adler was also originally associated with Freud, but felt Freud put too much emphasis on sexual motivations as well. Adler emphasized ambition and believed people experience a *striving for superiority*, the desire to seek excellence and fulfillment in life. Each of us attempts to create a *style of life* that embodies our personal plan for the attainment of that vital sense of superiority. He also contended that some people live with an *inferiority complex*, which is an exaggerated sense of their own weakness, inadequacy, and helplessness. As a result these people tend to overcompensate for their perceived shortcomings, often by belittling others in order to feel superior to them. His focus was on what he termed *individual psychology*. He believed that psychology should view the person as a whole rather than a composition of parts. Each of us has an ideal of how they would like to be and how to get there. He was also the first to characterize mental health as a positive state, and not just the absence of impairments. Finally, Adler believed people must develop a *social interest*, a sense of belonging and identification with other people. He characterized psychological disorders as resulting from people having set immature goals, having faulty styles of life, or showing little social interest.

Carl Rogers believed humans to be basically good, and that they have a natural drive for *self-actualization*, the achievement of their full potential. This is the ultimate goal we are all seeking. Early in life, children develop a *self-concept*, an image of who they really are, and an *ideal self*, an image of the person that would like to be. However, people who perceive a great discrepancy between their ideal and actual self experience *incongruity* and distress. Rogers also emphasized the importance of *unconditional positive regard* in important relationships. This entails complete, unqualified acceptance of a person as he or she really is, regardless of any faults they may have. An example might be the love of a parent towards a child. When a child behaves badly we point out we are displeased and disappointed by those actions, but not disappointed in the child. We don't stop loving our children just because they occasionally act badly.

Congruence

Experience

Self-concept

Well-adjusted individual
Considerable overlap between
self-concept and experience

Incongruence

Self-concept   Experience

Poorly adjusted individual
Little overlap between
self-concept and experience

Abraham Maslow proposed that there is a hierarchy of needs motivating our behaviors, the highest of which is *self-actualization*. Maslow attempted to describe the self-actualized (fully developed) personality. The characteristics he observed in those he believed had obtained this level included an accurate perception of reality, independence and creativity, self-acceptance, a problem-centered (as opposed to self-centered) outlook, enjoyment of life, and a good sense of humor.

The Cognitive-Learning Approach: On this view much, if not most, of our personality is learned on a situation-by-situation basis. We learn what patterns of behavior we are expected to follow in a given situation in accordance to the social norms of society. Children learn proper conduct and the appropriate roles to assume from both parental examples and from other children. This implies that much of personality is fairly malleable, at least initially.

Personality Traits: The main idea here is that there are consistent personality characteristics that exist in people and can be identified, measured and studied. Psychologists investigate individual differences in two different ways. The *nomothetic approach* is the general-to-specific approach; it identifies general laws about how some aspect of personality affects individual behavior, while the *idiographic approach* works from the specific to the general. It uses intensive case studies of individuals to identify general traits. A particularly important question is when personality traits are established. Do colicky babies grow up to be ill-tempered

adults, while happy babies grow up to be affable adults? The answer has a great deal of bearing on the respective roles of heredity versus environment in the shaping of personality.

   Personality Traits versus States - A *trait* is a consistent and relatively permanent tendency in behavior. Examples of such traits are characteristics such as shyness, hostility, or talkativeness. A *state* is a temporary manifestation of a particular behavior. Traits are believed to be pervasive, affecting behavior across a variety of situations over the course of the lifespan. States are transitory, and may not reflect the overall personality of an individual. The problem is to determine whether behavioral fluctuations are the result of transitory states affecting otherwise stable personality traits or whether personality is not really as stable as trait theories suggest.

   The "Big Five" Model of Personality - In 1965 Raymond Cattell identified 35 specific traits based on common terms referring to personality characteristics, but there was a large degree of overlap. Psychologists used *factor analysis* to determine which traits overlapped and which did not. Based on this approach, researchers identified what are termed the "big five" personality traits: *Neuroticism* refers to a tendency to experience unpleasant emotions relatively easily; *extraversion* describes the tendency to seek activity and to enjoy the company of other people; *agreeableness* refers to a tendency to be compassionate rather than antagonistic or indifferent toward others; *conscientiousness* refers to a tendency to show self-discipline, to be responsible, and to strive for achievement and competence; *openness to new experiences* refers to a preference for novelty, especially in intellectual experiences and ideas. Note that all of these have an opposite and can be expressed on a scale ranging from one extreme to the other. Many claim that the five-factor description can characterize personality for both men and women, and in a variety of languages and cultures. Although personalities seldom change drastically during adulthood, there is sometimes variation within the big five traits across the lifespan.

  The big five theory is primarily criticized because it is based on language rather than human behavior. Some of the critics claim that there are traits that have been overlooked. Still other psychologists say that even five traits are too many. Other problems cited with the big five theory include its basis on written questionnaires, its lack of theoretical grounding, and the arbitrariness of choosing five traits. The cross-cultural evidence for the five traits is decidedly mixed.

   The Origins of Personality - Heredity and environment both seem to be major influences on personality. Results from family studies indicate a moderate influence of hereditary factors, but the nature of these factors is unclear. So although it is believed that hereditary factors influence personality, how this occurs is unknown. The environmental factors influencing personality are also poorly understood. It is apparent that children learn little of their personality by imitating their parents. It is more likely that variations in people's personalities may relate to the *unshared environment*. These are the aspects of environment that differ from one individual to another, even within a family. Examples include school, time spent with friends, and time alone pursuing personal interests.

   Change versus Stability Over Time - Although personality seldom changes radically over the lifespan, it appears to become even more stable with increasing age. The older people get the slower they undergo personality changes. Hence the expression, "Becoming set in your ways." There are similarities in how all people's [personalities change with age](#). There is a gradual decline in social vitality (going to parties and clubs) and sensation seeking (experimenting with drugs, various physical activities) for most people, as they get older. Older people tend to be more stable emotionally and more agreeable (less argumentative and competitive). The most pervasive finding has been that as people grow older they become more conscientious, they follow through on their commitments and promises. This may reflect the need for greater responsibility in order to hold a job and support oneself and one's family.

Personality Assessment: The first thing to note is that personality assessment is not aimed at identifying basic personality characteristics. It is aimed at isolating and detecting personality disorders. Note also that it is a rather inexact science, often based on highly subjective data. And people have a tendency to accept vague descriptions of themselves as correct, they see how it might apply. Hence the popularity of horoscopes, often any of the twelve on any given day might apply to some extent to anyone.

   Standardized Tests - These are administered according to specified rules and the scores interpreted in a prescribed fashion. An important step is determining the distribution of scores for a large number of people, in order to determine general trends and therefore assess the degree of deviation. This establishes the necessary theoretical basis for the interpretation of such a test. Most tests in popular magazines are not standardized. The results of such tests should be viewed with skepticism. Unfortunately, it is also true that many of the best-

known and standardized personality tests used in psychology were developed with almost no theoretical basis.

Objective Personality Tests - The Minnesota Multiphasic Personality Inventory (MMPI) is the most widely used objective personality assessment tool. It consists of a series of true-false questions designed to measure certain personality dimensions. The MMPI was also constructed with certain safeguards, such as items specifically designed to identify people who are misrepresenting themselves. These items ask about thoughts and feelings that are unflattering, but common to all people. Those claiming never to have harbored such thoughts are feelings are mostly likely lying, and therefore the rest of their answers are also suspect. The MMPI was originally derived empirically through trial-and-error testing. It was found that persons with specific disorders tended to answer particular questions in the same way. So different patterns of answers to particular groups of questions can aid in diagnosing a personality disorder. It is also useful for researchers who want to correlate various personality traits with other traits or theories of personality development. The original group upon which its norms were based was not particularly diverse and so not representative of the general population to which the test has since been administered. Later revisions of the MMPI have been standardized on a more diverse base and have omitted now obsolete terms and references. The means and ranges for the MMPI scales are about the same for different ethnic groups, but psychologists must exercise caution in interpreting the scores of racial minorities. Although useful, the MMPI is criticized for its inefficiency, as a great deal of effort is required on the part of the subject in order to get precise results.

Projective techniques - These are designed to facilitate a person's "projection" of his or her personality characteristics onto a series of ambiguous stimuli. As they describe their impressions of the stimuli it is presumed that those descriptions reflect aspects of the individual's personality. The two most commonly employed are the *Rorschach Inkblot Test* and the *Thematic Apperception Test*. Graphology (handwriting analysis) has also been used as a projective technique to measure personality, and has been determined to have no validity for these purposes.

Criminal Profiling - This is an example of the questionable use of personality tests. No consistent relationships have been found between personality characteristics and types of criminals. So far the profiles of criminals that have emerged from these efforts differ little from those of members of the general and non-criminal public. So they are of little utility in narrowing the range of possible suspects, and of even less utility as far as suggesting what kind of person to look for when there are no clear suspects. Note also a fundamental flaw, the majority of data used to develop these profiles comes from convicted criminals. That tells us virtually nothing about the successful criminals who were never apprehended.

Psychological Disorders

TABLE 15.1 Some Major Categories of Psychological Disorders According to Axis I of DSM–IV

Category	Examples and Descriptions
Disorder usually first evident in childhood	**Attention deficit hyperactivity disorder:** impulsivity, impaired attention **Tourette's disorder:** repetitive movements such as blinking, twitching, chanting sounds or words **Elimination disorders:** bedwetting, urinating or defecating in one's clothes **Stuttering:** frequent repetition or prolongation of sounds while trying to speak
Substance-related disorders	Abuse of alcohol, cocaine, opiates, or other drugs
Schizophrenia	Deterioration of daily functioning along with a combination of hallucinations, delusions, or other symptoms
Delusional (paranoid) disorder	Unjustifiable beliefs, such as "everyone is talking about me behind my back"
Mood disorders	**Major depressive disorder:** Repeated episodes of depressed mood and lack of energy **Bipolar disorder:** Alternation between periods of depression and mania
Anxiety disorders	**Panic disorder:** Repeated attacks of intense terror **Phobia:** Severe anxiety and avoidance of a particular object or situation
Somatoform disorders	**Conversion disorder:** Physical ailments caused partly by psychological factors but not faked **Hypochondriasis:** Exaggerated complaints of illness **Somatization disorder:** Complaints of pain or other ailments without any physical disorder
Dissociative disorders	Loss of personal identity or memory without brain damage
Sexual disorders	**Pedophilia:** Sexual attraction to children **Voyeurism:** Sexual arousal primarily from watching others undress or have sexual relations **Exhibitionism:** Sexual arousal from exposing one's genitals in public
Eating disorders	**Anorexia nervosa:** Refusal to eat, fear of fatness **Bulimia nervosa:** Binge eating alternating with severe dieting
Sleep disorders	**Sleep terror disorder:** Repeated sudden awakenings in a state of panic **Insomnia:** Frequently not getting enough sleep to feel well rested the next day
Impulse control disorders	Frequently acting on impulses that others would inhibit, such as stealing, gambling foolishly, or hitting people

TABLE 15.2 Some Major Categories of Psychological Disorders According to Axis II of DSM–IV

Category and Examples	Descriptions
Mental Retardation	Intellectual functioning significantly below average; inability to function effectively and independently
Personality Disorders	
Paranoid personality disorder	Suspiciousness, habitual interpretation of others' acts as threatening
Schizoid personality disorder	Impaired social relations and emotional responses
Schizotypal personality disorder	Poor relationships with other people; odd thinking; neglect of normal grooming. (Similar to schizophrenia but less severe.)
Antisocial personality disorder	Lack of affection for others; high probability of harming others without feeling guilty; apparent weakness of most emotions
Borderline personality disorder	Lack of stable self-image; trouble establishing lasting relationships or maintaining lasting decisions; repeated self-endangering behaviors
Histrionic personality disorder	Excessive emotionality and attention seeking
Narcissistic personality disorder	Exaggerated opinion of one's own importance and disregard for others. (Narcissus was a figure in Greek mythology who fell in love with his own image.)
Avoidant personality disorder	Avoidance of social contact; lack of friends
Dependent personality disorder	Preference for letting other people make decisions; lack of initiative and self-confidence
Obsessive-compulsive personality disorder	Preoccupation with orderliness and perfectionism. (Similar to obsessive-compulsive disorder, but less severe.)