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## Lecture Notes:

*General Psychology with Lab (PSYC 1101)*

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## 1. Introduction to Psychological Science

What is science? Science is not a thing, it is not an entity. Science is a way of looking at the world. Specifically, science is a method of inquiry. It guides the way we ask questions. It guides the way we think about things. It guides the way we do things. It even guides the way we think about the answers. However, science cannot answer questions of morality (i.e., right and wrong). Science essentially seeks to answer the question: What is real? This is why scientific work is traditionally guided by codes of ethics. For example, the American Psychological Association requires that all of its members follow its Code of Ethics.

Opinions are not a method of inquiry. They are personal ways of knowing based on our experiences, thoughts, and feelings. They are meaningful on a personal level, but not on a public level. They can introduce bias (unfairness) into research. Science requires that we put our opinions aside. Opinions can guide our questions, but never our answers. This is because opinions introduce bias to how we ask questions, and how we think about the answers.

### Critical Thinking

We must use critical thinking in science. Critical thinking is the surest way to eliminate bias. It does not ask us to give up our beliefs. It instead requires us to ignore our biases, at least for the moment. Critical thinking about science prompts us to always ask: "What does the research say?"

Science is really just the scientific method. The scientific method is a set of steps we can take to explore the world. For each discipline (or branch) of science, the scientific method looks a little differently. However, every scientific discipline shares the common assumption that the world can be known through rationalism and empiricism. Thus, we can describe science in the form of an equation:

### Science = Rationalism × Empiricism

To explain a bit more, we can state that:

Science = Rationalism × Empiricism  
(Logic) (Observation/Testing)

Science is therefore the integration of rationalism and empiricism.

### Psychology

So, what is psychology? Psychology is a science. It is the scientific study of behavior. This does not mean there is no "mind." Yet, the concept of mind is very difficult to define. It is even more difficult to study. Thus, we limit our inquiry to questions of behavior, often wondering if we can apply our understanding to "mind."

There are three types of behavior: (a) cognitions, (b) emotions, and (c) actions. Whenever we want to investigate behavior, we have to specify the type(s) of behavior

(s). We can study any animal with psychological methods. Anything with a nervous system behaves. Humans are just one of many behaving species on this planet. So, we can now ask: What does the research say about psychology?

Psychology is a broad and vibrant discipline that focuses on the study of behavior (i.e., cognition, emotion, and action). There are many subdisciplines or subfields of psychology. However, the number of psychologists in each subfield is often disproportionate to the whole. For example, almost half of all psychologists are involved in just one of the three professional psychological fields. The most common research-oriented or academic psychological subfields appear to be social psychology, developmental psychology, and experimental psychology (which itself is comprised of several smaller specialties). However, the popularity of health psychology and neuroscience (a field often related to psychology) seems to be on the rise.

## **History of Psychology**

The history of psychology as a whole is characterized by what are commonly known as the major "schools" of psychology. Psychology officially began as a recognized science when, in 1879, Wilhelm Wünderst opened his psychology laboratory at the University of Leipzig. However, other underpinnings of psychology were already being developed elsewhere in Europe. This other approach was initially developed by Sigmund Freud, a neurologist by training, and has since become known as the first school of psychology.

Within a few decades of Wünderst's founding of his laboratory and Freud's rise to notoriety, many scientifically-oriented psychologists in the United States became frustrated with the psychodynamic approach to understanding the "mind" developed by Freud and his followers. Known as the second school of psychology, a new approach led by Watson and then Skinner was developed based on the newly discovered principles of behaviorism. These principles began with the recognition of classical conditioning, expanded to those of operant conditioning, and later included what is sometimes referred to as social conditioning. This set of ideas would hold sway over much of psychology well into the 1960s. However, psychology continued to develop and change was again afoot.

In the late 1950s and early 1960s, the third school of psychology arose in response to frustrations among many psychologists that behaviorism had become too limiting of an approach to understand human behavior. Hence, psychologists such as Maslow and Rogers pioneered the school of humanistic psychology. This school focused on human potential and an inherent drive in all people to develop toward their full potential. A positive force in the larger society for at least a couple of decades, humanistic psychology nonetheless suffered from poor research. However, this school of psychology continues to develop today (e.g., witness the slow rise in popularity among some psychologists in transpersonal psychology).

A number of authors have suggested that psychology is now experiencing a transition to a fourth school. However, debate exists regarding what will comprise the next direction for psychology. Some psychologists perceive that the discipline will increasingly move toward the neurosciences. Other psychologists think that the field will split, with professional psychology going the way of master's-level counseling. The

future remains unclear for the direction of psychology, but seems certain for the continued development of this dynamic field.

## 2. Personality

Personality is a pattern of behaviors that is relatively stable over time and across situations. It is the core set of behaviors that defines who we each are as individuals. The genesis of personality resides in the genetic code. For example, there is evidence that an infant will demonstrate a certain behavioral pattern immediately after birth. Such a pattern is known as temperament, the precursor of later personality. However, personality is by no means strictly determined by genetics. Instead, personality develops throughout early childhood as an interaction of this biologically-determined temperament with the environment. In other words, personality is very much a function of experience.

### Prenatal and Early Childhood Development

There is no question that prenatal development affects personality. Thus, let us briefly review the three stages of human gestation before we delve into the theories of personality. First, the zygotic stage (conception - 10 days) is characterized by the fusion of the ovum and sperm, and then the transit of this new zygote down the Fallopian tube to the back of the uterus, where it will implant. The zygotic stage is also known as the germinal stage of prenatal development. Second, the embryonic stage (10 days - 8 weeks) is characterized by a literally explosive rate of growth. During these weeks, the embryo will grow in size from a microscopic glob of cells to something the size of a grain of rice. It will also develop a recognizable "head" and "tail". The embryonic stage is highly susceptible to environmental teratogens. Third, the fetal stage (8 - 40 weeks) is characterized by the growth of the fetus into a shape quite recognizable as human by the time of birth. It is during this stage that the many tissues and organs assume their postnatal appearances. The fetal stage is also the time when the prenatate is most at risk for fetal alcohol syndrome (or the somewhat less pronounced diagnosis of fetal alcohol effects). Indeed, maternal alcohol use during gestation is the single largest cause of mental retardation in the United States. It is also 100% preventable.

Theory and some research suggest that personality forms during the first four or five years of life. This means that early childhood experiences strongly affect who the child will become as an adult. Opportunities for growth, lack of stimulation, and even trauma can have profound effects on personality development during these early years. Similarly, the relationships young children observe will likely direct how they later learn to relate to individuals of both genders. Much indeed occurs during early childhood toward the development of personality.

### Personality Theories

Numerous theories have been proposed to explain how personality develops. However, they must all ultimately be compared with Freud's theory of psychosexual development. Regardless of the fact that debate still exists among psychologists about its validity, Freud's theory remains robust and amazingly capable at explaining personality-based behavior patterns. Erikson's theory of psychosocial development is a

direct extension of Freud's theory. In his theory, Erikson attempted to explore personality development across the lifespan. For the most part, the theory works. However, there are problems. First, the theory fails to recognize that older adults are not easily compartmentalized into only one stage. Second, the theory may or may not be multiculturally applicable.

Still other theories of personality attempt to address either personality development or personality functioning. For example, Rogers's client-centered theory of personality is more a theory of how adults function than it is of why people develop as they do. Perhaps his most powerful concept is the importance of unconditional positive regard. The most recent research, which is quite fascinating, stems from the work of Costa and McCrae. These researchers have developed the Big 5 theory of personality, which demonstrates that people all over the world appear to maintain the same five universal personality traits. The most impressive aspect of this theory is that it is entirely driven by research. It is also interesting to note that the Big 5 demonstrates that personality development is likely the same for people regardless of their cultural, ethnic, or socioeconomic backgrounds.

### **3. Biological Foundations of Behavior**

The neuron is the basic unit of the nervous system. It is thought that there are approximately 100 billion neurons in the typical, adult human brain. On average, each of these neurons communicates via synapses with 1,000 other neurons. This is an amazing degree of complexity. It places the brain as the most complex organ in the body.

#### **Nervous System**

The human nervous system is comprised of two main branches. The central nervous system (CNS) includes the brain and spinal cord. The peripheral nervous system (PNS) involves all of the other many nerves throughout the body. The PNS is further divided into the autonomic nervous system and the somatic nervous system. The autonomic nervous system is comprised of the nerves that allow the brain to control and monitor the many automatic organ functions of the body. The somatic nervous system includes those nerves that allow for sensation and perception, as well as for movement. They are thus used for intentional behaviors. Finally, the autonomic nervous system can be broken down into two smaller components. The sympathetic nervous system mediates the arousal response (i.e., the fight-or-flight response). The parasympathetic nervous system controls the opposite, the relaxation response (i.e., the healing response).

#### **Brain**

For our purposes, most of our attention this semester regarding the nervous system will focus on the brain. Specifically, we are interested in the cerebral cortex, the outermost layer of highly advanced tissue that covers most of the brain. The cortex is divided into two sides, or hemispheres. They are connected by three bridges, the largest being the corpus callosum. Each cortical hemisphere is further comprised of four lobes: (a) frontal, (b) parietal, (c) temporal, and (d) occipital.

Each pair of lobes has certain special functions. The occipital lobe is the primary location for vision. Located at the rear of each hemisphere, this lobe processed basic visual information such as shape and color. The temporal lobe is involved in both hearing and memory, and exists on the side of each hemisphere. Sensory perception is located in the parietal lobe, which rests toward the top of each hemisphere. Its most notable area is the primary somatosensory cortex. It is the frontal lobe at the front of each hemisphere, however, which makes us the most human. The frontal lobe serves two main functions. First, the frontal lobe contains the area known as the primary motor cortex, which directs all intentional muscular action. Second, the areas known as the prefrontal cortex (at the very front of the lobe) and the orbitofrontal cortex (resting above the eye socket) process the executive functions. The executive functions include such abilities as planning and abstraction.

## 4. Sensation and Perception

Sensation and perception are not synonymous terms, and we must take care not to use the terms interchangeably. Sensation implies that some type of environmental energy is being transduced into neural energy. It also implies that the environmental energy has passed the absolute threshold of whatever sensory apparatus is being used. There are five basic forms of sensation: (a) vision, (b) audition, (c) olfaction, (d) gustation, and (e) somatosensation (in the skin). However, there are quite a few additional types of sensation.

### Psychophysics of Sensation

All of the senses operate via the psychophysical law of the just noticeable difference (JND). Also known as the difference threshold, the JND is the minimum amount of environmental energy that is noticed at least 50 percent of the time. Basically, it is understood that the JND worked via Weber's Law. This was an idea that, for each individual sense, the JND varies as a constant. For example, Weber's Law states that the JND for gustation is 20 percent. This means that it takes a 20 percent increase or decrease in stimulation to notice the difference in food. So, if we put a little piece of food on our tongue, it takes a very little bit more to be noticed. However, if we have a mouth full of mashed potatoes, it takes a lot more of the same to notice the difference in taste. Either way, gustation varies by a constant of 20 percent for the JND.

### Perception

We also need to address the concept of perception. Whereas sensation is simply the transduction of environmental energy to neural energy, perception is the process of creating meaning from sensory information. I might sense various shades and hues in the distance, but I perceive a painting. Perception can be understood via two main phenomena. Perceptual organization entails the integration of a figure into a ground. This is a concept from Gestalt psychology. You can demonstrate this for yourself. Hold a pen or pencil at arm's length, and focus your vision on it. Notice what happened to everything else in the room? Now, focus on something in the room past the pen or pencil. What happened to the image, the perception, of the pen or pencil? This is how perceptual organization works in vision.

Perceptual constancy is equally important. Take a look outside where people or automobiles are passing by you. Do you become confused when the images of the people or cars change from their fronts to their sides to their backs? No, the brain has the ability to synthesize those series of images of the people or automobiles from various angles into a conceptual whole. Thus, the brain can hold constant its perceptions, as demonstrated by this example of vision.

### Color Vision

An interesting example of perception is color. In reality, color does not exist in the objective world. There is no such thing as a green shirt. Instead, the cloth of such a

shirt may be dyed with pigments that reflect the middle of the visual spectrum. The "green" cones of the retina are especially sensitive to light of such a wavelength. Thus, more "green" cones than "red" or "blue" cones transduce the light reflected from the shirt. When the brain receives the different levels of information from each cone type, it perceives the shirt to be green.

### **Sensory Adaptation**

One of the key features of the sensory receptors, and thus of the entire process of perception, is the ability to adapt to different levels of environmental energy. Imagine walking into a strange hotel room with the lights on. As you look around this odd-looking room, someone turns off the lights. Since it is nighttime and there is no moon out tonight, the room becomes pitch black. For a minute or so, you can see nothing. Then, slowly, you start to notice the shapes of the various pieces of furniture. In another moment, you begin to see detail. This process is dark adaptation. Our receptors respond by becoming more or less sensitive (i.e., changing their thresholds) when the level of energy in the environment changes. In the current example, our retinal receptors became more sensitive in the low-light room.

### **Perception**

Perception is more, however, than sensation and adaptation. Perception functions via the processes of perceptual organization and perceptual constancy. Perceptual organization allows the brain to interpret meaningful relationships between different aspects of the environment. Perceptual constancy allows the brain to interpret changes in the environment to represent changes in the location or position of otherwise stable objects. Such complex abilities allow us to behave in a meaningful and successful manner within our environments.

## 5. Consciousness

Studies of consciousness typically separate all conscious states into two categories. Waking consciousness involves the normal awareness of the various cognitive processes and environmental events in everyday waking life. In other words, waking consciousness is the typical waking state in which one meaningfully interacts with the world. Conversely, altered states of consciousness represent any state of consciousness other than waking consciousness. Such altered states of consciousness include sleep and dreams; the intentional practices of meditation, visual imagery, and hypnosis; and the effects of psychogenic drugs.

### Sigmund Freud

Consciousness has eluded a concrete definition for more than a century. Nonetheless, we can consider the phenomenon from the perspective of at least two major theorists. Freud thought that there were two discrete categories of consciousness: (a) consciousness (i.e., our experience of being aware of self and environment), and (b) unconsciousness (i.e., all of the many processes that occur in the brain below our waking awareness). Indeed, much of psychoanalysis was developed to address the effects of unconscious processes on conscious behaviors. Unconscious processes are more modernly known as the subconscious.

### William James

James perceived of a stream of consciousness. He used the analogy of a river to explain this idea. Let us say you roll up your pant legs and stand in the middle of a shallow river. As you stand there, you look down and watch the water moving past your ankles and feet. A few minutes pass by, and then someone asks, "Are you still standing in the same river?" James argued that the answer to this question was "yes" and "no." Yes, you are standing in the same river, because the river has not moved. It continues to course along its path. Simultaneously, no, you are not standing in the same river. With each moment in time, the water and its contents that pass by your ankles is different from every moment before and after that point in time. James explained that we could understand consciousness much as a river or stream. Although our overall consciousness of the world and the self remains the same over time, specific brain states and environmental stimuli change every moment. This is indeed a profound idea, one that is increasingly supported by neuroscience research.

### Sleep

Of particular importance to many psychological scientists is the set of phenomena related to sleep. The four stages of non-REM sleep are identifiable with the use of an EEG (e.g., an electroencephalogram) that measures gross brainwave activity. REM sleep, or rapid eye movement sleep, is also demonstrable with an EEG. Research also indicates that total hours of nightly sleep decreases as we age, with REM sleep comprising a proportionately smaller amount of total sleep. Several theories

are even available to help us understand why we dream. However, there is as of yet no scientific consensus on the topic. What is certain from a scientific standpoint, however, is that the majority of books on dream interpretation available in the self-help sections of bookstores are not worth the paper on which they are printed.

### **Parasympathetic Response and Healing**

Meditation, visual imagery, and hypnosis comprise a set of intentional processes in which individuals use the power of the brain to positively affect the body. Various forms of meditation have existed across cultures, especially those of China and India, for thousands of years. Recently, a laboratory at the University of Wisconsin has produced high-quality research on the neuroscience of meditation among expert Buddhist monks. Visual imagery is a technique in which an individual uses imaginary visual scenes or scenarios to enter a state of deep relaxation and healing. Finally, hypnosis is a potentially powerful practice in which an individual learns to focus his attention while becoming very relaxed, thereby opening himself to posthypnotic suggestions. Such posthypnotic suggestions are often used to reduce anxiety, provide encouragement, and otherwise improve health and healing.

### **Neural Correlates of Consciousness**

Currently, the proverbial holy grail in consciousness research is to identify the neural correlates of consciousness (NCC). This is essentially a fancy term for the idea that there exist specific neuronal events underlying specific conscious experiences. For example, during the summers I typically experience a strong sense of happiness whenever I smell the roses in front of my house. Perhaps this is an identifiable group of neurons in the brain that allow me to have the experience I label as "happiness". At least, this is the idea behind research on NCC. The reality is that we really do not know if there are always neural correlates of consciousness, or if the idea only applies to more basic functions such as visual perception.

### **Substance Use**

Finally, drug use can be classified into three levels. Use is defined as the occasional, nonpathological use of a substance. Having a drink once in awhile is use, and typically is not psychologically or physically unhealthy. Abuse is a level of drug use that causes the individual to experience distress and impairment. Dependence is another term for addiction, and is defined as a level of abuse in which the individual experiences cravings for the substance and has impaired functioning because of its use. Tolerance and withdrawal are common symptoms.

## 6. Learning

Learning is the process by which experience or practice results in a relatively permanent change in behavior or potential behavior. That is, anyone can learn something and use that learning, or learn something and use that learning later. Learning is thus implicit in most aspects of live. However, learning is actually a large phenomenon that builds upon the more basic processes of conditioning. It is therefore to conditioning that we must first turn if we are to understand the concept of learning.

### Conditioning

The term “conditioning” denotes a very basic process. Specifically, conditioning is the acquisition of a specific behavioral response in the presence of a well-defined stimulus. A stimulus is any event in the environment that elicits/causes a behavior response. Such behavioral responses include thoughts, feelings, and actions. Conversely, a response is a behavior that is elicited/caused by a stimulus. An example is if you hear a loud noise behind you and quickly turn around to see what happened. The loud noise, out in the environment or world, is the stimulus in the situation. Your turning around is the response. We can graph the idea as a stimulus-response chain.

S → R

There are three types of conditioning: (a) classical conditioning, (b) operant conditioning, and (c) social conditioning. As we will shortly see, the combination of these three types of conditioning allows for real learning. However, we must first visit each type of conditioning in brief to build our case.

### Classical Conditioning

Classical conditioning was discovered in the 1800s by Ivan Pavlov. Interestingly, Pavlov was not a psychologist at all, but a Russian physiologist interested in the processes of digestion. Through his work with dogs, Pavlov realized that conditioning could occur through the association or pairing of something known with something new.

US → UR  
CS + US → UR  
CS → CR

Because its processes take place at a very basic, biological level, classical conditioning is typically subconscious, occurring below one’s level of awareness. In addition, classical conditioning typically requires many, many trials of association or pairing before we can say that a response (i.e., behavior) is conditioned. This type of conditioning is nonetheless the most basic.

## Operant Conditioning

Operant conditioning was discovered and developed by a number of people, most notably John B. Watson, Edward Thorndike, and B. F. Skinner. John B. Watson, perhaps the original father of the concept, went so far as to state that, if allowed to raise a child in a completely controlled environment, he could determine the future interests and behaviors of that child. Although we now know this to be impossible, the point remains that operant conditioning is a very powerful influence on behavior. This was demonstrated through the work of B. F. Skinner. Skinner maintained that behavior is conditioned through reinforcement and punishment. A reinforcer is any stimulus that makes a behavioral response more likely to be repeated in the future. For example, if a loved one says to you, "I love you," and you smile at them, they are more likely to say it again to you in the future since your smile is likely a reinforcer (i.e., a reward). Conversely, a punisher is any stimulus that makes a behavioral response less likely to be repeated in the future. Receiving a speeding ticket for driving too fast, at least in my opinion, is punishment. Thus, after receiving an expensive speeding ticket, I am less likely to speed again.

Much as with classical conditioning, the processes of operant conditioning can be graphed. However, notice that it seems to be reversed in operant conditioning.

R	R
+	+
$S_R \rightarrow R$	$SP \rightarrow R$

Operant conditioning largely occurs at a subconscious level. However, some of it is very plainly conscious, accessible to our everyday awareness. For example, attending college undoubtedly results in very obvious rewards toward one's personal and professional growth. The behaviors of attending classes, studying, and participating are thus reinforced on a regular and clear basis.

## Social Conditioning

The third and final type of conditioning is social conditioning. Social conditioning works via imitation and modeling, and is often labeled as a form of "cognitive learning". As discovered by Albert Bandura, people can be conditioned simply by observing others being conditioned. This occurs through the processes of vicarious reinforcement and vicarious punishment. These processes are vicarious because the conditioning is happening "through" another person. This was very poignantly demonstrated by Bandura's original research on children and aggression. In other words, the children in the study observing the video were reinforced to imitate the adults' behaviors, even though they were not specifically told to do so. Similarly, recent research on television viewing demonstrates that children who watch much television are more likely to be aggressive, to struggle with their schoolwork, and to maintain traditional gender stereotypes. Social conditioning is, indeed, a powerful form of conditioning that can result in long-term learning, be it positive or negative.

To summarize, each type of conditioning builds upon the type(s) before it. Classical conditioning, conditioning by association, allows us to associate some things as reinforcers and other things as punishers. This leads to operant conditioning. Operant conditioning allows us to respond to, and shape, our environments. And social conditioning allows us to adapt to what we see, hear, and our taught all without having to immediately participate in the behaviors. When one is conditioning through these embedded levels in a meaningful way, learning takes place. Such learning allows us to benefit from reading a book, having a conversation, or even just going for a walk and observing nature.

## 7. Memory

Memory is the ability to remember real and imagined events and learning. Mnemonic research began with Ebbinghaus in the 1800s. Although he used himself as the sole subject in many of his studies, his results nonetheless continue to concur with modern research. Currently, mnemonic processes are often conceptualized within the information-processing model. This model stipulates that the brain processes information much as a computer (i.e., information is inputted, processed, and then outputted). The brain actually processes information in much more complex ways. However, the information-processing model does provide us with a common point of reference to begin our exploration into memory.

### Encoding, Storage, and Retrieval

Memory appears to demonstrate three parts. Information from an environmental stimulus is initially received via the sensory register. In the presence of sufficient attention, this information is then encoded by the hippocampus into short-term memory. Rehearsal or a strong emotional component will both tend to move the memory into long-term memory. Considered from a slightly different stance, memory can be considered as manifesting three main processes: (a) encoding, (b) storage, and (c) retrieval.

### Explicit Memory

There are several types of memory, which can be grouped under the two main categories of explicit versus implicit memory. Explicit memory is also known as declarative memory, and entails those memories for the "what". In other words, explicit/declarative memory involves anything that one can verbally explain. Stating that George Washington was the first president of the United States is an example of explicit memory. Explicit memory includes semantic memory (for facts and concepts), episodic memory (for personal events), and prospective memory (for thoughts of future events). Explicit memory is the result of the hippocampus directing engrams (i.e., memories, or memory traces). Here is how it works:

**Stimulus → Sensory Register → STM → LTM → Response**

### Implicit Memory

Implicit memory is also known as procedural memory, and entails those memories for the "how". In other words, implicit/procedural memory involves anything that one learns to do motorically (i.e., with the muscles). Knowing how to ride a bike is an example of implicit memory. Interestingly, have you ever forgotten how to ride a bike? I doubt it. Unlike explicit memory, which can fade with time, implicit memory appears to be highly resistant to decay.

## **Short-term Memory**

An interesting feature of short-term memory is that it can be improved via chunking. Alternatively, long-term memory for information can be improved via the use of elaborative rehearsal. According to the research on serial position effects, information learned during the beginning (primacy effect) and the end (recency effect) of a session is more likely to be remembered than information learned during the middle of the session.

## **Mnemonic Skills**

Much can be done to improve memory, especially when studying for classes. The research indicates that at least four mnemonic strategies tend to work. First, the use of external cues such as stickies and calendars is an easy and efficient way to aid in memory. Second, rehearsal is the key to learning anything of detail. In other words, it pays to study and study and study. Third, organizing the information you wish to learn can help with memory. For example, when I take notes, I arrange the information on the page as I write. Fourth, elaboration through meaning and humor is potentially a very powerful mnemonic tool.

## 8. Intelligence

Research indicates that neural plasticity is the primary biological factor underlying the development of intelligence (this is also largely true regarding memory). Neural plasticity is the brain's ability to adapt to environmental stimuli. The dendrites and synaptic buttons of any given neuron have the ability to redirect to new synapses. These physical changes occur over hours to days. However, what I think is even more remarkable is that the dendritic spines change by the minutes. Dendritic spines appear as very, very small hairs along the lengths of the dendrites. As an individual learns new information, the dendritic spines change shape and location along the dendrites.

### **Spearman's g**

With the ability to accurately test, we can better understand the concept of intelligence. Intelligence was perhaps best defined by Gardner as an individual's psychobiological potential to solve problems. Historically, intelligence has been understood according to Spearman's idea of "g", or a general factor of intelligence. His research supports the notion that the many abilities of the brain can be summarized into such a general factor, and then more specifically explored by considering each "s", or specific factor. This approach was soon expanded to include the specific factors of verbal (V) and nonverbal, visuospatial performance (P) intelligence. Indeed, the most common series of intelligence tests (the Wechsler scales) yield separate scores for V and P. Statistically combined, these scores result in an overall score known as the Full Scale score. In other words, intelligence testing can meaningfully yield an intelligence quotient (IQ), a number that summarizes an individual's general cognitive ability

### **Gardner's Multiple Intelligences**

However, two other theories of intelligence have been developed in more recent decades. Gardner's theory of multiple intelligences posits that there are instead eight separately identifiable types of intelligence. These intelligences include: (a) linguistic, (b) logical-mathematical, (c) spatial, (d) kinesthetic, (e) musical, (f) intrapersonal, (g) interpersonal, and (h) naturalistic. Gardner has also proposed a ninth possible intelligence, existential intelligence, but research has yet to support its inclusion in the theory. Conversely, Sternberg's tripartite theory of intelligence suggests three types of intelligence: (a) analytical, (b) practical, and (c) creative. According to both theories, individuals may demonstrate any pattern of strengths and weaknesses across the respective types of intelligences.

### **Socioeconomic Status**

Low socioeconomic status (SES) has a negative correlation with academic achievement in childhood and can bias intelligence test results. Consequently, there exists a range of special educational services available to children in many school districts. There also exist a few larger programs. Specifically, the federally-funded Head Start program has demonstrated major utility. Participation in this program

(actually designed for children in early childhood) has been found to correlate with improved academic and social outcomes for children from low SES homes.

## **Intelligence and Age**

As adulthood progresses, there is a risk toward cognitive decline. Fluid intelligence, which tends to peak near age 30, typically demonstrates an accelerating decline over subsequent decades. Conversely, crystallized intelligence can remain quite intact well into late adulthood. Research indicates that cognitive exercise can notably preserve functioning. Thus, continued involvement in cognitively demanding tasks throughout adulthood may yield improved cognitive capacities well into late adulthood. Such preservation may manifest itself via the characteristics of expertise or wisdom.

## **Creativity**

Creativity is the ability to approach and solve problems from a novel perspective. Guilford labeled creativity as divergent thinking. Whether primarily determined in the individual via genetics and/or experience, creativity seems to peak during the late 20s or early 30s. This is similar to the general peak witnessed at the same point in the lifespan for general cognitive abilities. Perhaps it is not surprising that those abilities seemingly dependent upon intelligence tend to peak at the same time of life.

## **9. Motivation and Emotion**

The study of motivation typically involves a consideration of a few related concepts: (a) motive, (b) drive, and (c) arousal. The umbrella term for these concepts is the motive. A motive is an internal state that guides behavior to achieve a goal. It can be intrinsic or extrinsic. We can explore this idea and the related concepts from the perspective of two theories. According to the psychodynamic perspective, a drive is an internal state of tension or arousal that motivates behavior to satiate that drive. For example, thirst can be considered a drive. When one is thirsty, one is motivated to drink. The act of drinking results in a satiation or satisfaction of the original drive. The presence of drives furthermore suggests that organisms seek homeostasis, an internal state in which the physiological and/or psychological processes are in balance. This set of processes is known as the drive-reduction theory.

### **Drive-reduction Theory v. Arousal Theory**

However, the drive-reduction theory does not explain everything about motivation. For example, what about those situations in which it is advantageous to be aroused? If I am walking down the street one evening and hear a loud noise behind me, perhaps it would be better to become agitated and walk more quickly. In order to explain such situations, we can turn to arousal theory. Arousal theory suggests that there is an optimal level of arousal for any specific task. As demonstrated by the Yerkes-Dodson Law, the optimal level of arousal is inversely correlated with the complexity of the task. In other words, it is better to be relaxed when doing something complex. It is conversely better to have more energy when doing something simple.

### **Primary and Secondary Drives**

We can further explore the processes of motivation (using the older terminology, but from a modern standpoint) by considering the two types of drives. Primary drives motivate behavior to obtain water, food, and sex. There is also debate among psychologists that affection should be included as a primary drive. Secondary drives motivate behavior to obtain any other thing previously associated with a primary drive. If this sounds familiar, then you are thinking along the correct track. Primary and secondary drives are essentially the flip-side of the reinforcement coin. Primary drives are satiated by primary reinforcers. Secondary drives are satiated by secondary reinforcers. We now have the other half of the picture regarding how operant conditioning really works.

### **Abraham Maslow**

Perhaps the most famous theory of motivation was that developed by Abraham Maslow. In his hierarchy of needs, we can identify a logical sequence of things that motivate human behavior. Although the research behind the theory is mixed, the concept is nonetheless thought-provoking and worthy of discussion. Indeed, the theory

is widely accepted today by psychologists. As an aside, most people seem to think they are farther along the pyramid than they really are.

## **Emotion**

Emotions are feelings. When one feels happy, sad, or angry, that person is experiencing an emotion. Quite contrary to what many lay people have written over the years, it appears that emotions may function as an initial attempt to understand one's environment. For example, having a "gut feeling" about something is actually a complex neural process that, while more basic than true thought, is nonetheless responding to environment cues that may be subliminal. The integration of emotion with cognition can potentially yield a powerful way to accurately understand the world.

There are a number of theories of emotions, but the research appears to support the Schachter-Singer theory of emotion. This theory emphasizes the importance of a cortical response to environmental cues during the creation of an emotion. There are also basic emotions. Similarly known as the universal or primary emotions, these minimally include: (a) happiness, (b) sadness, (c) surprise, (d) anger, (e) fear, and (f) disgust. The research behind these basic emotions is especially profound because it demonstrates yet again that humans across the globe are fundamentally the same.

## 10. Social Psychology

Social psychology is the study of the behavior of individuals within groups. This is a rather perspective compared with the other subdisciplines of psychology, all of which study the behavior of individuals. Alternatively, the science of sociology is the study of group behavior. The focus of individual behaviors within groups has resulted in a range of interesting studies. Indeed, few branches of psychology have made such an impact on society as social psychology.

Persuasion is an intentional effort to change another individual's attitudes. Richard Petty and John Cacioppo developed the elaboration likelihood model to describe how information that challenges an individual's attitudes can be processed via central or peripheral routes. Similarly, our impressions of others is affected by a number of psychological factors. For example, impressions of others are often guided by our subconscious responses to their nonverbal behaviors. Such "body language" includes matters of kinesics, proxemics, and haptics. Nonverbal interactions are not unique to humans; think of the last time you observed two dogs meeting one another while being walked.

A great deal of research has been devoted toward the elucidation of attributions. An attribution is an individual's causal explanation for events. Research tells us that our attributions are often biased. This can be observed in the just world hypothesis and the fundamental attribution error. Stereotypes are an especially insidious influence on interpersonal behavior. Individuals tend to perceive all others as either belonging to their own in-group or to one of many out-groups. Such a dichotomous view of self and others can result in prejudice and discrimination.

Group behavior presents another interesting set of phenomena. According to Robert Zajonc, social facilitation often occurs simply because one is in the presence of a group of individuals. Conversely, group dynamics often foster social loafing, and can even result in group polarization. A much greater risk to personal and group safety, however, can result from deindividuation and the power of social norms to foster conformity and obedience in the behavior of individuals.

Aggression has been a topic of psychological investigation for nearly a century. Its study dates to the early 20th century. However, the focus on aggression became all the more relevant after the atrocities of World War II and the Holocaust. John Dollard suggested the frustration-aggression hypothesis to help explain why individuals in modern society still readily become irate. Interestingly, levels of aggression appear to vary as a function of culture.

## **11. Health and Well-being**

Stress is a psychological tension or strain. In everyday life, we attempt to cope with stress through any number of activities. However, we can better understand stress through the lens of behaviorism. In this light, a stressor is any even that elicits a stress response. And stress is that stress response elicited by a stressor. Stressors come in many varieties. A traumatic experience can certainly cause a stress response. However, the reality is that most people experience stress in response to life changes and daily hassles. The study of stress and its interaction with psychological and physical health is known as health psychology.

### **Kurt Lewin**

In the 1930s, Kurt Lewin proposed that individuals must often settle psychological conflicts, such as whether to accept one job over another. He specifically stated that there exist three psychological conflicts: (a) approach-approach, (b) approach-avoidance, and (c) avoidance-avoidance. Essentially, approach means "win", and avoidance implies "lose". We therefore are faced with win-win and lose-lose situations in life. However, it is the approach-avoidance conflict that tends to be the most difficult to solve. Such conflicts present both win and lose characteristics. An example might be when an individual wishes to break up with a significant other. He no longer wishes to remain in the relationship, yet he does not want to emotionally hurt his partner. This is an example of an approach-avoidance conflict.

### **Karen Horney**

Alternatively, Karen Horney considered that coping is typically accomplished through three primary methods: (a) confrontation ("let's solve the problem"), (b) compromise ("maybe there is some way to get close enough to solving the problem"), and (c) withdrawal ("let's avoid the problem"). Although all three methods can be effective, an overreliance on withdrawal can result in greater emotional upset.

### **Stress and Psychoneuroimmunology**

According to Lazarus and Taylor, who worked separately, whether an individual manifests a stress response to any given stressor is largely dependent upon that individual's appraisals of the stressor. In other words, there exists an important cognitive component to the experience of stress.

The study of the interaction between the nervous system, the immune system, and the endocrine system is known as psychoneuroimmunology (PNI). Selye was one of the earliest pioneers in this area of research, as demonstrated by the development of the General Adaptation Syndrome in response to chronic stress. Indeed, research demonstrates links between chronic stress and heart disease. There is even question about the effect that stress may play in cancer. Much more research remains to be done in the discipline of PNI, but much headway is already in progress.

There are many methods by which we can learn to reframe perceptions of stress and therefore better cope. My experience suggests that engaging in activities that relax us may be the best route. For example, you might learn guided visual imagery or meditation. Perhaps you find long walks in the woods to be calming. Whatever it is, I encourage you to find one or more approaches to feeling healthier and hopefully living happier.

## 12. Psychological Disorders

A psychological disorder is basically defined as any set of behaviors that interferes with two or more areas of daily functioning. Such behaviors may include intrusive thoughts, ongoing sadness, repetitive movements, and many others. They may interfere with relationships, work, school, and/or others aspects of life. The concept of psychological disorders has garnered many labels over the years. Currently popular is the notion of mental illness. I personally do not favor this label of psychological disorders, as it is based on the medical model. The medical model asserts that an illness is something wrong with a system that must be fixed. Alternatively, regardless of the level of problems, viewing a set of behaviors as a psychological disorder provides for what I think is a more balanced consideration of an individual's conscious and subconscious efforts to manage his or her stress. To note, the study of psychological disorders is known as psychopathology. It is thought by some professional psychologists that most symptoms (unhealthy behaviors) are actually maladaptive attempts to cope with stressors.

### Models of Psychopathology

Historically, there are a number of models with which we can consider the psychological disorders. The biological model states that psychological disorders are caused by problems at the physiological or even genetic level. The cognitive-behavioral model states that psychological disorders are the result of learning to think and act in unhealthy ways. The diathesis-stress model states that some people maintain a specific genetic vulnerability to specific stressors that result in psychological disorders when triggered. Finally, the systems model suggests that psychological disorders develop as a result of the interplay between biological, psychological, and social processes. In actuality, each model allows us to understand most psychological disorders from different perspectives. This integrative approach thereby helps us to choose the best level of analysis for each presenting problem.

### The *DSM* and Its Disorders

There are many categories of psychological disorders recognized in the DSM-IV-TR. Known as the "DSM", this is the common source used by all professionals trained to diagnose psychopathology. By far the most common psychological disorder categories are anxiety and depression. Anxiety disorders are marked by a level of anxiety, which may or may not be outwardly exhibited, that is incongruent with the actual stressors in the environment. For example, an individual with a General Anxiety Disorder tends to feel quite apprehensive all of the time, even though there are no threats in his environment. The depressive disorders are officially known as the mood disorders. Mood disorders are characterized by disturbances in mood. The most common type of mood disorder is Major Depressive Disorder, which is what most people think of when hearing the term "depression." However, there are also such mood disorders as Bipolar I Disorder, which is marked by variable periods of depression, mania, or a simultaneous combination of the two.

Although not a set of problematic behaviors, Mental Retardation is primarily noted by a level of intelligence at least two standard deviations below the population mean of 100. Thus, individuals with Mental Retardation have IQs of 70 or below. Personality disorders are enduring, inflexible, and maladaptive patterns of behavior that cause significant impairment in daily functioning. As opposed to the other categories of disorders, these disorders are ego-syntonic. In other words, individuals with personality disorders are typically unaware of their problematic behaviors and often blame others for treating them inappropriately.