

PSY 201 Session 3.

Topics: Learning. Memory. Thinking, Intelligence, and Language

Learning:

Classical Conditioning

Also called "*Pavlovian* conditioning" is a type of learning based on the association (or pairing) of two stimuli (signals).

Operant Conditioning

The type of learning based on the modification of behavior brought about by the consequences (reward or punishment) that follow upon the occurrence of the behavior.

Cognitive-Social learning

The type of learning based on complex social and psychological factors including understanding, acceptance, imitation, choice, calculation, etc.

Development of psychological views on learning:

There is nothing in our experience and behavior that has not been learned at some point in the past (John Watson, Rosalie Raynor).

Certain behaviors and experiences are retained by people because these behaviors and experiences allow them to cope effectively with the environment (Ivan Pavlov, Burrhus Frederic [B.F.] Skinner)

People learn by (a) choosing particular "environments" and (b) by observing and imitating the behavior of other people within these environments (Albert Bandura).

People acquire certain cognitive styles, which they use to learn about their environment (Julian Rotter).

Learning disabilities can be divided into three broad categories:

Developmental speech and language disorders

Developmental Articulation Disorder

Developmental Expressive Language Disorder

Developmental Receptive Language Disorder

Academic skills disorders

Developmental Writing Disorder

Developmental Reading Disorder

Developmental Arithmetic Disorder

"Other," such as certain coordination disorders and learning handicaps not covered by the other terms

Developmental Speech and Language Disorders

Speech and language problems are often the earliest indicators of a learning disability. People with developmental speech and language disorders have difficulty producing speech sounds, using spoken language to communicate, or understanding what other people say. Depending on the problem, the specific diagnosis may be:

Developmental Articulation Disorder. Children with this disorder may have trouble controlling their rate of speech. Or they may lag behind playmates in learning to make speech sounds, such as saying "wabbit" instead of "rabbit" and "thwim" for "swim." Developmental articulation disorders appear in at least 10 percent of children younger than age 8. These disorders can often be outgrown or successfully treated with speech therapy.

Developmental Expressive Language Disorder Some children with language impairments have problems expressing themselves in speech, such as calling objects by the wrong names, speaking only in two-word phrases (4 y.o.), or not answering simple questions (6 y.o.)

Developmental Receptive Language Disorder Some people have trouble understanding certain aspects of speech, such as not responding to his or her name, when it is called, giving "wrong" objects (a preschooler who hands you a bell when you asked for a ball), or not following simple directions. Their hearing is fine, but they cannot make sense of certain sounds, words, or sentences they hear. They may even seem inattentive. Because using and understanding speech are related, many people with this disorder also have an expressive language disability.

Academic Skills Disorders

Developmental Reading Disorder

Developmental Writing Disorder

Developmental Arithmetic Disorder

Memory

Memory can be explained as a sequence of three processes:

Encoding, Storage, and Retrieval of information

Three stages of memory:

- Sensory (up to 3 seconds)
- Short-term (up to 30 seconds)
- Long-term (potentially permanent)

Memory-related problems

Amnesia (serious memory loss)

Traumatic Memories (memory associated with a traumatic experience)

False Memories (sincere yet incorrect recollections)

Amnesia: Any serious dysfunction of memory that causes significant psychological distress and affects daily functioning of an individual.

Types of Amnesia:

- Temporary (as in Dissociative Amnesia)
- Permanent (as in Dementia of the Alzheimer's type)
- Retrograde (backward-acting amnesia)
- Anterograde (forward-acting amnesia)

Intelligence

Examples of questions included in intelligence tests

This is a child of your father, but this person is not your sibling (neither brother nor sister)? Who is this person?

If two mice can eat two crackers in two minutes, how many mice will it take to eat 18 crackers in six minutes?

Which of the following is closest in meaning to the saying, "A man is known by the company he keeps"?

"One swallow doesn't make a summer." Or: "Birds of a feather, flock together." Or: "Don't judge a book by its cover."

Which vowel comes between J and T?

EXAMPLE:

man

board = Man overboard

WHAT IS IT?

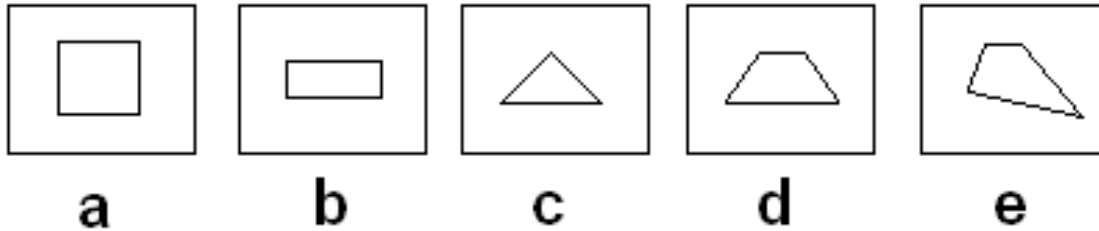
knee

light

ground

feet
feet
feet
feet
feet
feet

Find the odd one out:



Today is Wednesday. What will the fourth day from yesterday be?

- a) Sunday b) Monday c) Friday
d) Thursday e) Saturday

What do these people have in common?

Peter Jennings, Mike Myers, William Shatner, Keanu Reeves, Dan Aykroyd, Jim Carrey, Michael J. Fox, Pamela Anderson, k.d. lang, Neil Young, Alanis Morissette, Paul Shaffer, Shania Twain, Alex Trebek, Lorne Michaels.

How IQ is calculated

Children:

$$\text{IQ} = \frac{\text{Mental Age}}{\text{Chronological Age}} \times 100$$

Adults:

$$\text{IQ} = \frac{\text{Personal Score}}{\text{Average Score}} \times 100$$

Mental Retardation

Major symptoms appearing together:

- failure to meet intellectual developmental markers
- persistence of infantile behavior
- lack of curiosity
- decreased learning ability and inability to meet educational demands of school
- a score below 70 on a standardized IQ test

Causes of mental retardation can be roughly broken down into several categories:

- unexplained (This category is the largest and a catchall for undiagnosed incidences)
- trauma (prenatal and postnatal)
- infectious (present at birth and postnatal)
- genetic and chromosomal abnormalities
- metabolic
- toxic
- nutritional
- environmental (social or educational deprivation)

Mental Retardation. Types:

Mild mental retardation

Approximately 85% of the mentally retarded population is in the mildly retarded category. Their IQ score ranges from 50-75, and they can often acquire academic skills up to the 6th grade level. They can, in some cases, live independently, with community and social support.

Moderate mental retardation

About 10% of the mentally retarded population is in this category. Moderately retarded individuals have IQ scores ranging from 35-55. They can carry out work and self-care tasks with moderate supervision. They typically acquire communication skills in childhood and are able to live and function successfully within the community in a supervised environment such as a group home.

Severe mental retardation

About 3-4% of the mentally retarded population is in this category. Severely retarded individuals have IQ scores of 20-40. They may master very basic self-care skills and some communication skills. Many severely retarded individuals are able to live in a group home.

Profound mental retardation

Only 1-2% of the mentally retarded population is classified as profoundly retarded. Profoundly retarded individuals have IQ scores under 20-25. They may be able to develop basic self-care and communication skills with appropriate support and training. Their retardation is often caused by an accompanying neurological disorder. The profoundly retarded adolescents need a high level of structure and supervision.

Sometimes people with diminished intellectual functions don't comprehend sophisticated legal terms. Here is an example of the Miranda Warning Form

Table 3

Alternate Miranda Warning Form

1. You have the right to remain silent.
"You do not have to talk to anyone. Tell me in your own words what I just said?"
2. Anything you say can and will be used against you in a court of law.
"What you say can get you in trouble. Tell me in your own words what I just said."
3. You have the right to talk to a lawyer and have him present at any time during questioning.
"You can talk to a lawyer before you say anything else. Tell me in your own words what I just said."
"Your lawyer can be with you if you talk to anyone. Tell me in your own words what I just said."
4. If you cannot afford a lawyer, one will be appointed for you without cost.
"If you cannot afford a lawyer, the judge will get you one for free. Tell me in your own words what I just said."

Featured Articles about Savants

NASA studying 'Rain Man's' brain Scanners could shed light on savant's mental capabilities

The Associated Press
Updated: 12:46 p.m. ET Nov. 8, 2004



SALT LAKE CITY - NASA scientists are studying autistic savant Kim Peek, hoping that technology used to study the effects of space travel on the brain will help explain his mental capabilities.

Last week, researchers had Peek — who was the basis for Dustin Hoffman's character in the 1988 film "Rain Man" — undergo a series of tests including computerized tomography and magnetic resonance imaging, the results of which will be melded to create a three-dimensional look at his brain structure. The researchers want to compare a series of MRI images taken in 1988 by Dr. Dan Christensen, Peek's neuropsychiatrist at the University of Utah, to see what has since changed within his brain.

Not only are Peek's brain and his abilities unique, noted Richard D. Boyle, director of the California center performing the scans, but the fact that he seems to be getting smarter in his specialty areas as he ages is unexpected.

The 53-year-old Peek is called a "mega-savant" because he is a genius in about 15 different subjects, from history and literature and geography to numbers, sports, music and dates. But he also is severely limited in other ways, like not being able to find the silverware drawer at home or dressing himself. "The goal is to measure what happens in Kim's brain when he expresses things and when he thinks about them," said his father, Fran.

9,000 books memorized

He came to the attention of NASA researchers at the Center for Bioinformatics Space Life Sciences at the Ames Research Center when he spoke in late October at a Rotary Club in central California.

When Kim Peek was born, doctors found a water blister on the right side of his skull, similar to hydrocephalus. Later tests showed his brain hemispheres are not separated, forming a single, large "data storage" area.

It is likely that is why Peek has been able to memorize more than 9,000 books, his father said. But he has lagged in other areas; his motor skills developed more slowly than those of his peers. Fran Peek doesn't need the test results to know much has changed for his son in the last 16 years. He was a shy young man with few social skills when the movie propelled him to public notice. But now, after speaking to more than two million people over the years, his father says he become calmer and is more at ease speaking in front of people. He also no longer reads only nonfiction, Fran Peek said, but has dabbled with some fiction, such as books by Stephen King, because that is what so many people talk about. When he's home in Utah, Peek spends afternoons at the Salt Lake City Public Library poring over books, even memorizing phone books and the Cole's address directory. Kim Peek was the model author Barrow Morrow used for the original "Rain Man" script and screenplay, but the final product retained only a small part of the original story.

Copyright 2004 The Associated Press. All rights reserved. This material may not be published, broadcast, rewritten or redistributed.

The Extraordinary Abilities of an Autistic Savant

Englishman Can Visualize Complex Math, Learn Icelandic in Seven Days, But Had Difficulty Learning to Walk and Express Himself



June 11, 2005 — - Daniel Tammet of England can verbally reel off the number pi to 22,500 decimal places in just over five hours -- though he admitted after a recent demonstration that it made him "very tired."

Tammet, 26, is a phenomenon. He has done lots of amazing things -- like learning Icelandic, one of the world's most difficult languages, in just seven days.

That's because Tammet is an autistic savant. His extraordinary abilities stem from a combination of autism and a condition known as synesthesia. His form of autism, however, leaves him with less limited verbal skills than many other autistics.

Mixing of the Senses

Tammet experiences things through a mixing of the senses that the rest of us can't imagine. For instance, when he does math, he said, "I see landscapes in my mind. The numbers turn to shapes.

"They knit together in a way that forms almost like hills and mountains in my mind," he added, "full of color and full of shape and full of movement."

Tammet's talents are like those of the "Rain Man," portrayed on film by Dustin Hoffman and based on the life of Kim Peek, who Tammet once met.

"Amazing," Tammet said of the meeting. "There was something that was special for both of us, and I know it hasn't left me."

There are perhaps fewer than 50 autistic savants in the world, according to estimates by experts. Those few are people with remarkable, often staggering skills and challenges.

Autism may be the fastest-growing developmental disability, according to numbers from the Autism Society of America. Approximately one in 250 children have some form of it. That's up 172 percent in the 1990s.

Some of those kids also have savant abilities. No one knows why.

Learning to Walk

For all his remarkable gifts, Tammet has some everyday difficulties stemming from his autism. For instance, he doesn't like to come to a beach just a few minutes from his home because it is made up of pebbles — too many even for him to count. That makes him uncomfortable.

Tammet can't drive or do many other things that require basic coordination. Just walking is something he had to do through an effort of will.

"I had to teach myself how to look and how to walk," he said, "how to move myself, how to coordinate myself without falling over, without looking down, without getting absorbed in my own self, my own world."

Tammet grew up one of nine children in working-class East London. He went to high school and some college, did not get special grades and works primarily as a tutor and consultant because he has a difficult time in a normal work environment.

After years of effort, Tammet has overcome many of his autistic disabilities. Now living outside of London, not only can he relate to people, he can describe what the experience of autism is like from the inside.

He loves silence, for instance.

"I experience it as like a silvery texture around my head, like condensation running down a window," he said. "If there's a sudden noise, it's like a shattering of that feeling."

Eloquent Voice of Autism?

Such eloquence may be Tammet's most remarkable gift, and it makes him a prime subject for autism researchers.

"Part of what we might learn from studying Daniel is, for example, how he perceives the world," said Simon Baron-Cohen, a professor at Cambridge University's Autism Research Center. "We know that people with autism attend to details much more than most people. And that means that if you're trying to teach somebody with autism, the details will matter."

Researchers from around the world are studying Tammet. Some believe his case may show that there's a savant in all of us, a little Rain Man, you might say, if only we could find a chemical or other way to unlock those abilities.

In a way, one might say Tammet has come back from the country of autism, which is a very difficult place for researchers and for parents to reach.

"I've come from a place where I felt so lonely, and so unwanted in a way," Tammet said. "And I've come along this road, and I've found this bridge, and I've come across it. And I don't know how, I don't know why, but I'm here and I'm able to talk to you today. And, for me, that's amazing."

ABC News' Terry Moran and Lenny Bourin originally reported this story June 5, 2005, on "World News Tonight."

Copyright © 2006 ABC News Internet Ventures

Language Acquisition Device (LAD)

Source:

[Encyclopedia of Childhood and Adolescence](#) by Jill De Villiers, Ph.D. Smith College

Learning theorists argue that the environments of young children everywhere are supportive of learning. All young children are surrounded by speech from the beginning: parents and others address remarks to babies, respond to their vocalizations and heap praise on their earliest attempts to say words. People adjust their own speech to accommodate the young child's needs, simplifying their vocabulary, shortening their sentences, and talking about the here-and-now, usually in a special speech "register." This motherese or parentese that cues the child that this is talk meant for the child's ears.

There are some theorists who argue that this environmental support gives the child everything necessary to "figure out" the rules of language. In other words, the child is like a miniature linguist, collecting evidence to decide among hypotheses about the grammar. But mathematical linguists have determined that any set of sentences is compatible with an infinite set of possible grammars. In 1968 a startling proof showed that human

language is unlearnable in a finite amount of time: there are too many potential rule systems that could have generated the set of sentences a learner has heard at any one time.

One solution is to argue that the child receives accurate corrective feedback about his hypotheses. Under this kind of condition, language would be learnable in a finite time. But evidence for reliable and consistent corrective feedback in the average child's environment is very weak. When it comes to grammar, most parents notice only the superficial mistakes made by their children, and these only when the child is "old enough to know better," e.g., saying *foots* or *comed* when in grade school. Parents do provide some feedback about the clarity or truth of their children's sentences, but studies reveal that adults do not provide reliable feedback on the grammaticality of children's sentences. Explicit correction seems to be too rarely and inconsistently used to "train" the child to speak grammatically.

The alternative solution is to claim that the child has some preconceived ideas, or innate knowledge. Learning language is possible in a finite amount of time if the learner already knows the range of possibilities existing in universal grammar. Linguistic approaches to language acquisition assume that some knowledge about language is built into the human child.

Linguistic theory states that languages are deeply similar in ways that have only just begun to be uncovered. All languages seem to make use of the same small inventory of categories for the construction of sentences: noun phrases, verb phrases, sentences, and the like. In addition, there are principles that seem to be universal and which constrain the forms that sentences can take. Currently many people are persuaded that these facts might be part of the assumptions that the child brings to the language acquisition task. The child may in fact "know" that sentences are built from the abstract categories, and know in advance the principles that dictate that the rules are going to have a limited range of possible forms. These central ideas were introduced by Noam Chomsky in 1965 and have motivated much work on language development. Chomsky proposed that children are born with a Language Acquisition Device (LAD) that contains hypotheses that guide their language learning.

To demonstrate the subtlety of the abstract principles on which these arguments depend, consider the following short story:

Once there was a boy who loved climbing trees in the forest. One afternoon he slipped and fell to the ground. He picked himself up and went home. That night when he had a bath, he saw a big bruise on his arm. He said to his dad, "I must have hurt myself when I fell this afternoon."

Now comes the question:

a) *When did the boy say he hurt himself?*

Notice there are two possible answers, either to when he said it, or to when he hurt himself. That is, the "when" question could be connected to the "say" or to "hurt." Research shows that three-year-olds also allow both answers: sometimes giving one, sometimes the other. But now consider the subtle variant:

b) *When did the boy say how he hurt himself?*

Suddenly, the ambiguity is gone, and only one answer seems right: "that night in the bath." Three-year-olds also only give that answer to b). They seem to know already the constraint that question words may not "move" over another question word: a constraint that is embedded in universal grammar.

For a learning theory account to be viable, the two-year-old would have to have the ability to sift through evidence of this subtlety to arrive at the appropriate generalization. The problem that then arises is the rarity of such sentences. In hundreds of hours of recorded conversations between several young children and their caregivers, there are typically only a couple of dozen examples, and of course never the close contrasting pairs described above. It does not seem plausible that the child learns the contrasts for himself.

Instead, it is argued, the child is in possession of considerable pre-existing knowledge about the forms that rules can take. There is still considerable scope for learning theories. Even if the starting point is not a "blank slate" but a LAD, the child has to learn the meaning of every word in her language: no one has argued that words are innate! Furthermore, the child has to use the evidence of conversation to make a multitude of choices about the rules of her language (and their irregularities). The doctrine of innate ideas may have a relatively limited role to play except in defining the boundaries within which learning can take place.

Further Reading

- Berko-Gleason, J. *The Development of Language*. New York: Macmillan, 1993.
- de Villiers, P., and J. de Villiers. *Early Language*. The Developing Child series. Cambridge, Mass.: Harvard University Press, 1979.
- Fletcher, P., and B. MacWhinney. *The Handbook of Child Language*. Cambridge, Mass.: Blackwell Publishers, 1995.
- Goodluck, H. *Language Acquisition: A Linguistic Introduction*. Cambridge, Mass.: Blackwell Publishers, 1991.
- Pinker, S. *The Language Instinct*. New York: Morrow, 1994.

Could anyone fake the symptoms of mental retardation?

TACOMA, Wash. (AP) - A Vancouver man was sentenced in 2007 to 13 months in prison for pretending to be mentally retarded in order to claim disability benefits. Pete J. Costello, 28, pleaded guilty in February to conspiracy to defraud the government and to Social Security fraud. He began receiving disability benefits when he was 8. He was ordered to repay the \$59,226 he has received since turning 18.

Costello, who cannot read or write, dictated a letter to his public defender that was submitted to the judge before sentencing and filed in court.

"I know that it was wrong to 'act like a child' in the Social Security office when that is not how I really am," the letter said. "I feel very bad about this and want to do everything I can to pay this money back."

Costello's mother, Rosie Costello, 46, who also pleaded guilty, is to be sentenced Thursday for coaching her son and daughter to feign mental retardation. Authorities have not found the daughter. Pete Costello continued to fake retardation into his mid-20s - picking at his face, slouching and appearing uncommunicative in meetings with Social Security officials. The scheme came to light last year after he got a traffic ticket in Vancouver, then was videotaped acting normally when he contested the ticket in court.