**UNIT 7**

**COGNITION: Memory, Thinking, Language, and Creativity**

**MEMORY**

The **Information Processing Model** of memory is based on three phases:

Encode-

Store-

Retrieve-

*Write down an example from your life (something that you might do or come in contact with) that fits the “encode, store, retrieve” model.*

*Another model for memory is the* ***Atkinson-Shiffrin model.*** *It is similar to the Information Processing Model, however the Atkinson-Shiffrin model differentiates between different types of memory.*

Sensory Memory-

Short-term Memory (STM)-

Long-term Memory (LTM)-

**ENCODING**

How do we encode information? Obviously the more deeply you process information, the more likely you are to remember it. The following are methods for encoding.

Rehearsal-

Chunking-

Visual encoding-

Auditory encoding-

Semantic encoding-

Mnemonic Devices-

*Method of loci-*

*Peg Word mnemonic-*

***DIRECTIONS: Answer the following questions.***

1. Give an example of how you would use one of the above encoding techniques.

2. How does the hippocampus relate to this unit?

**STORAGE**

Short-term Memory:

How long does STM last?

How much can STM hold?

***DIRECTIONS: Define the following types of memory.***

Episodic memory-

Flashbulb memory-

Procedural memory-

Semantic memory-

State dependent memory-

Context dependent memory-

**RETRIEVAL**

Many of the problems we have with memory involve “retrieval cues”, meaning the memory is “in there” but we just can’t seem to pull it out. This is known as the “Tip of the Tongue” phenomenon.

***DIRECTIONS: Define the following.***

Recall-

Recognition-

Implicit memory-

Explicit memory-

Serial Position Effect-

Primacy Effect-

Recency Effect-

**ARE OUR MEMORIES RELIABLE?**

"War & remembrance," Orange County Register (Sunday, November 3, 2002).

By AMY WILSON

Academics can debate anything. It's healthy. It's what, among other things, they are paid to do. They can also go to war. Which is something different altogether. War has casualties. It also produces gladiators. Elizabeth Loftus is a cognitive psychologist whose research into how memory works is so deep and so wide and so highly regarded that the April issue of The Review of General Psychology ranked her 58th among the top 100 psychologists of the 20th century. She is the highest-ranking woman on the list. She is also one of the 25 psychologists most often cited in psychology textbooks. She is also controversial.

She is, and has been for three decades, very much in the debate business. Her belief that memory is highly malleable and susceptible to all kinds of contamination was debated for a while, until she proved in the laboratory in the 1970s and '80s that she was right.

Then, just when she was getting bored, came a host of new cases, straight from therapy, that were claiming that memories of traumatic events - horrific and usually sexual - could be deeply submerged in childhood, then, like Jonah spit forth from the whale, plumbed and revived, wholly intact. Loftus said, "I don't think so."

Thus, the Memory Wars - as they are called by *Science News* and *Psychology Today* - began. They pit one set of psychologists against another: one that says "recovered" memories, especially those of sexual abuse, are true and should always be believed, another that says these memories probably are implanted by therapists mucking around with something they don't understand; the result is memories that cannot be believed, or should not be believed without corroboration.

Loftus is the leader and the unapologetic lightning rod for the latter bunch, which lost a lot of the early battles in the 1990s but has lately been winning a lot, especially in the courtroom.

It's a war she is happy to fight, professionally and publicly. She has testified for the defense in more than 250 cases, saying that you can't trust memory. But in fall 1999, the war, which was always personal, turned against her, personally. It almost broke her.

Ultimately, it made her leave a house she'd lived in for 28 years and a university that she had given her life to. It made her leave her breakfast club. It made her watch all those wronged- women movies on Lifetime television. It made her come to the University of California, Irvine. Which has made her deliriously happy. And if you think she was determined before to win this war, you should see her now.

This, then, is a story about how the most influential female psychologist of the past century came to Orange County, and all the stuff she brought with her. Less than a month into her new job in Irvine, an "NBC Nightly News" crew is in her office. Down the hall, waiting their turn, are folks from the Discovery Channel. CNN is calling at 2 p.m.

She is absolutely at ease, citing her own research, explaining in sound-bite fashion how memory, especially of a crime, gets distorted.

The phone rings.

"Why do people lie in such cases?" she repeats into the receiver. "I could guess, but I'm not an expert on lying. You're going to need to find yourself another psychologist." The Baltimore Sun reporter rethinks his position and asks another question. She begins to explain what she is an expert in. That would be the porousness of memory, how it can adapt itself to new information and make it its own; how it can be fooled; how it can invent; how it can be recounted with confidence, emotion and detail and still be wrong.

She proved in study after study that the mind is not some videotape device that we can count on for accuracy and clarity. She has shown that memory is highly susceptible to seduction by suggestion. That what we remember is colored by what we expect to see, what we're told we've seen, what we want to see, what we are asked to see.

She has, literally, persuaded subjects in a laboratory they have seen barns in barren fields. She has convinced teenagers and older children that they were lost in a mall when they were small. After the convincing, they actually painted remembered details of a day that never happened.

The great thing about Elizabeth Loftus is that she will tell you pretty much anything you ask. A couple of days in, and you know that a guy left her once because she used the wrong ply toilet paper. Or how, after writing a book on repressed memory, she got some death threats and tried to learn to use a gun, but "that it's not how I wanted to live," even though a practice range target in her office says she was handy with a .44.

Then she'll explain to you, in real words because you don't have a Ph.D. and a 46- page resume and four honorary degrees and 19 books to your credit, how memory works and how it doesn't. She'll laugh when she adds that her first memory is from when she was 8, which is ridiculously late for a first memory.

She'll tell you how she's helped a lot of people you don't like. Like Ted Bundy, O.J. Simpson, the Hillside Stranglers, the McMartin Preschool workers and almost every parent accused of incest suddenly remembered in a therapist's office. She'll tell you that she makes $400 an hour just to explain her science to 12 people at a time. And how that kind of makes her feel like Robin Hood.

Loftus started out wanting to explore how information was organized in long-term memory. "It was pretty theoretical stuff, and me and five other people cared about it. I just decided one day that I wanted something with more practical application than that. I asked myself, 'What do I talk about at parties, when there is no reward attached, except that I am interested in it?' My answer: legal stuff."

She realized she needed a grant to study such a thing, so she called someone she knew at the U.S. Department of Transportation and was told, "There's money if you want to study traffic accidents." She began by asking how we remember traffic accidents. In 1974, she went public with her findings in Psychology Today, and pretty soon there wasn't a defense attorney in the land who didn't know her name. This was OK with Loftus. She found, much to her own surprise, that helping to serve justice made her happier than anything she had ever done. Prosecutors didn't like her much. One called her a whore.

In 1976, she was asked to testify for Ted Bundy, accused of a string of murders. She was just this young scientist who believed "that science was there for everyone. Memories aren't this smoking gun. There has to be more evidence than that." She took the assignment. Bundy was convicted anyway. She continued to testify, making a serious dent in eyewitness reliance. She gave countless speeches to every manner of law enforcement agency. She guested at law schools and answered endless media inquiries.

"Up until (1990), I was just the Eyewitness Lady," Loftus says, "and a few prosecutors didn't like me very much. Then came the repressed- memory stuff and I got kind of energized and then I was hated by a whole lot of new people who'd never heard of me before." They had not heard of her but they had heard of Freud. It's his word, repression - the idea that we can hide things from ourselves in our subconscious - that got latched onto when the public was served up a dazzling array of past parental deviation, starting around the time that Roseanne Barr told People magazine in 1991 that she was, probably, an incest survivor.

It had begun for Elizabeth Loftus the summer before, when the defense attorney for a California man named George Franklin called. Franklin stood accused by his adult daughter of murdering her best friend when the girls were 6. The only evidence the prosecution had was Eileen Franklin's newly discovered flashbacks of the crime, remembered during her own therapy. (She would later accuse her father of more murders, remembered.)

If other people were calling up Freud, well, so could she. Loftus went back and scoured Freud and everything ever written about what we bury and how we bury it. Wanting to know more, she was still baffled. How do you study something the subject doesn't know is there?

She testified about post- event suggestion and the damage that years do to memory. But that testimony was not effective in keeping George Franklin from being convicted of murder. The ball was just getting rolling. Fed in part by more open discussion and acknowledgment of child abuse, therapists were beginning to report a lot of remembered incest.

Loftus, of course, believes that child sexual abuse occurs. But she also is adamant that, as a memory, "it is stored normally and can decay with time." It can be a memory not often returned to, she says, and can be painful to remember, but it is not something new that the subject is surprised to find and explore.

She believed that abuse, rather than being suppressed, is largely an event children do not forget. Loftus noted that the cases she was hearing about were, additionally, products of encouraged invention that led her to be highly critical of therapists.

"No one says memory's infallible anymore," says Robyn Fivush, professor of psychology at Emory University. "Loftus has done a tremendous amount of incredibly good work to demonstrate that you could introduce error into memory."

In fall 1989, Holly Ramona, a troubled Napa Valley girl, came to UC Irvine to study. She was bulimic and depressed. She sought therapy. On the first day with Irvine therapist Marche Isabella, Ramona and her mother, Stephanie, were told that 70 percent to 80 percent of bulimics had been sexually abused as children. During Holly's therapy, under Isabella's encouragement, Holly began to remember repeated sexual abuse by her father. Holly was unsure if the memories were true and agreed to be given sodium amytal, a drug she had been told was "truth serum." In that interview, which was overseen by psychiatrist Richard Rose at Western Medical Center-Anaheim, Holly retold her stories of abuse that she said began when she was 5 and continued until she was 16.

While at the hospital, Holly confronted her father, Gary, who was then a $500,000-a- year executive with the Robert Mondavi wineries. He denied everything, explaining that he could not apologize or seek therapy for something he had not done. His wife divorced him. The stories of the incest led to his expulsion from Mondavi. He lost everything.

"It is somehow so preposterous, the process by which people can be led to believe such things," Loftus says, "and then are led to act upon them." It is, she adds, as if they need an explanation that is large enough to encompass the depth of their unhappiness.

"And they search until they find one that fits that description."

With the help of Loftus and others, Gary won the unprecedented right to sue his daughter's therapist, the psychiatrist involved in the confessions and the Anaheim hospital in which they took place. Then Loftus was among those who convinced a Napa jury in 1994 that Holly's Orange County caregivers had created Holly's memories for her, assured her they were true, then forced a confrontation that split the family irreparably, harming everyone in their path.

Gary was awarded $475,000. Isabella and Rose left the state. Holly, who did not respond to the Register's request for an interview, went on to study psychology at Pepperdine University. A subsequent lawsuit that Holly brought against her father was summarily dismissed as groundless.

The net result: "The trial took the teeth out of the witch hunt," says Moira Johnston, who chronicled the family's story in "Spectral Evidence: The Ramona Case, Incest, Memory, and Truth on Trial in Napa Valley" (Houghton- Mifflin, 1997).

Prosecutors filing charges began asking for more evidence than a single recovered memory, and medical malpractice insurers were less willing to go to bat for therapists. George Franklin, who had been imprisoned for murder based on the sole evidence of his daughter's recovered memory of the killing, was emboldened to appeal his case in 1995. It was dismissed in 1996, and Franklin is now free.

The Ramona trial was also, Johnston adds, "a war between two women" (the other was San Francisco psychiatrist Lenore Terr) "who represented different points of view. Beth won. (The other side) still hates her because she discredited and humiliated them." Terr declined to be interviewed for this story.

The tide is continuing to turn. At a meeting this year of the American Psychiatric Association, a team of panelists determined that Recovered Memory Treatment controversy was dead. But, the statement from the APA reads, "Psychiatry still needs to help the main victims of RMT: those falsely accused of heinous crimes which never happened."

Elizabeth Loftus' mother drowned when Elizabeth was 14. Elizabeth kept a diary before that terrible day and after. The diary reveals a child who is desperately hurt but believes that one day she will get past missing her mother. She has not. It is, she believes, what fuels her own workaholism and her desire, sometimes, to see shattered families made whole. To this day, she cannot mention her mother without tears. Loftus, the memory whiz, says she is hard-pressed to remember much about the woman she still misses.

A few years ago, Loftus was told that she was the one who had found her dead mother in the pool. For 35 years, Loftus believed it was her Aunt Pearl who first saw her mother's lifeless body in the water. For several days, Loftus searched her own memory for proof to support the new information. It came. She reinterpreted everything that happened that day in a new way, building up the memory. The scene was re-created in her mind with her in it.

Then her uncle called to say he was mistaken. She never saw her mother dead.

**PROBLEM SOLVING**

Problem solving isn’t just for math! We are always problem solving, from simple tasks (such as which route to take to school) to complex ones (like deciding what to do with your life).

Concept-

Superordinate category-

Basic category-

Subordinate category-

Prototype-

Convergent vs. Divergent Thinking-

Incubation-

Metacognition-

Algorithm-

Heuristic-

*Write an example of an activity where you have used a heuristic.*

**PROBLEMS WITH PROBLEM SOLVING**

*Errors in problem solving*

Availability Heuristic-

Representative Heuristic-

Functional Fixedness-

Mental Set-

Implicit Assumptions-

. . .

. . .

. . .

*Take no more than five seconds to respond to the following.*

“ What is 8 times 7 times 6 times 5 times 4 times 3 times 2 times 1.”

Estimate: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

“ What is 1 times 2 times 3 times 4 times 5 times 6 times 7 times 8.”

Estimate: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Framing-

Confirmation Bias-

***DIRECTIONS: Think about stereotyping and prejudice. How does confirmation bias factor into people maintaining their prejudices?* (1-2**

**paragraphs)**

\*\*PLAY HANGMAN\*\*\*

**Language**

**LANGUAGE** Hard wired or learned?

The study of language, how we acquire it and how it interacts with behavior and cognition is sometimes called **psycholinguistics.** Do you think we are born “wired” with the ability to speak, or do you believe we speak only because we are taught to do so? Or, is it a combination of the two?

***DIRECTIONS: Summarize the circumstances of Genie and the Wild Child of Aveyron.***

“Genie”-

“The Wild Child of Aveyron”-

**The Hard-Wired Argument**

Noam Chomsky-

Language Acquisition Device (L.A.D.)-

Critical (a.k.a. sensitive) Period-

**The Learned Argument**

B.F. Skinner-

**LANGUAGE DEVELOPMENT**

***DIRECTIONS:*** *Write the basic progression of language in a newborn. Give rough age estimates and include the terms and definitions of* ***phonemes****,* ***holophrastic speech****,* ***telegraphic speech****,* ***morphemes*** *and* ***syntax****.*

Around 2 months-

Around 6 months-

Around 1 year-

Overgeneralization-

Descriptive Grammar-

Prescriptive Grammar-

Linguistic Relativity Theory (Whorfian Hypothesis)-