

# Endel Tulving

*cognitive psychologist*

World's authority on human memory function

"Don't listen to authorities. Find out what the problem is, find out the facts, and make up your own mind. Use the scientific method to work things out. There's no reason why the scientific method should stay in the lab. It can solve many problems and I wish more people would adopt the experimental method 'let's try this and see if it works.' There's no reason to expect this to be the right answer. Trust your feelings and try out various things. Use trial and error, objectivity and plenty of alternatives."

## The Person

Birthdate May 26, 1927

Birthplace Estonia

Residence Toronto, Ontario

Office Rotman Research Institute, Baycrest Centre

## Family Members

¥ Father Juhan

¥ Mother Linda

¥ Spouse Ruth d. Eduard and Hilda Mikkelsaar 24  
June 1950

¥ Children Daughters Elo Ann Tulving-Blais, Linda

Status Semi-Retired, but working hard

## Degrees

¥ B.A. 1953 U. of T. Honours Psychology

¥ M.A. 1954 U. of T. Psychology

¥ Ph.D. 1957 Harvard University, Experimental  
Psychology

## Awards

¥ Fellow, Center for Advanced Study in Behavioural  
Sciences, Stanford Cal. 1972-73

¥ Sr. Rsch. Fellowship, Nat. Rsch. Council 1964-65

¥ Izaak Walton Killam Meml. Scholarship, Can. Council  
1976

¥ Howard Crosby Warren Medal Soc. Exper. Psychols.  
1982

¥ Distinguished Sci. Achievement Award, Am. Psychol.  
Assn. 1983

¥ Foreign Hon. Mem., Am. Acad. of Arts and Sciences

1986

¥ Guggenheim Fellowship 1987

¥ Foreign Assoc., U.S. Nat. Acad. of Sciences 1988

¥ Foreign Mem., Royal Swedish Acad. of Sciences

1989

¥ Fellow, Royal Soc. of London 1992

¥ William James Fellow, Am. Psychol. Soc

Character creative, impatient, positive, optimistic

Favourite Music Dvorak New World symphony, opening movement; Sibelius

Other Interests

¥ Tennis

¥ Walking

¥ Chess,

¥ History of science.

## **The Story**

Tulving is standing at the blackboard before a 4th year cognitive psychology class at the U of T. They're on the fourth floor of the newly built Sidney Smith building. It's a long unfriendly room with no windows. A blackboard stretches the length of one wall. Everyone is sitting around a big table. There's a smell of fresh paint. Tulving is espousing his theory that memory is two part laying down the memories and retrieving them are separate functions. "Just because a person cannot recall a word seen only a minute ago does not mean that the word is not in memory," says Tulving.

A student says, "Well, do you have any evidence for this."

Tulving says, "But this is self evident," nevertheless noting the doubtful expression on the student's face. They break for coffee and Tulving goes to his office around the corner. Deep in thought and troubled about the situation in the classroom he comes up with an experiment to demonstrate his point to the class. He conducts the experiment, using the class as subjects. He tells everyone to concentrate and listen carefully while he says about twenty words "Yellow", "Rifle", "Beethoven", "Violin", etc. After he is finished he asks the class to write down as many as they can remember. Most can get about 8 or 10. After they are done he picks up a student's paper and notices that she did not remember the word "Yellow". He says, "Do you remember a colour?" Instantly the student remembers "Yellow". He repeats this for the other missed words with the same miraculous result. Finally, the doubting student reluctantly admits, "Perhaps you have a point."

## **History**

Tulving grew up in urban Estonia, the son of a judge, but enjoyed summers at the family

farm. His passion was sports, especially track and field. "I was not at all interested in science--not one bit." Some of his teenage thoughts When did time begin, what was before time, where does the universe end, ESP--is it possible? etc. Basically Tulving was a good student, but spent most of his time pursuing sports. His friends were fascinated by crystal radios, but he was not. "I found it boring because it was totally predictable whereas I was concentrating on trying to run one hundred meters in under 12 seconds." Tulving built himself a track on the family farm and practiced everything there from the 100 meter dash to javelin throwing.

Tulving went to Gymnasium, a type of high school in Estonia although because of the war he finished gymnasium in Germany at age 19. The only subject he found interesting was psychology, because it was totally incomplete--he thought everything else was already known.

Tulving left Estonia when he was 17. Because of the war and the Soviet occupation of his country, Tulving was separated from his parents for the next 20 years without knowing what had happened to them. From 1945-49 he spent 4 years in Germany. After the war ended he worked for the Americans as a translator and spent one year as a medical student at Heidelberg.

## **The Science**

Cognitive psychologists study the human mind. They ask "How do we know anything?" or "What is a memory?" To Tulving, the human mind is the biggest unsolved mystery in the universe. He uses brain scanners to figure out how memory works.

### **1. Encoding**

Tulving proved that memory is a two stage process. First memories are laid down. The front left part of the brain plays an important role in this.

### **2. PET Scan**

A PET scanner is a machine that shows what parts of your brain are especially active while you are doing or thinking something. PET stands for Positron Emission Tomography.

### **3. Retrieving**

The right front and left rear of the brain appear to be important for memory retrieval. Scientists don't know why some parts of the brain encode memories and other parts retrieve them.

## **The Activity**

Ask a friend to name all the months of the year and time the response. Most people can do this in about 8 seconds. Now ask the person to name them in alphabetical order. Almost no one can do this correctly in less than two minutes. Both questions ask you to use your memory to retrieve something from your mind that you already know. Tulving's

research shows why one is so much easier than the other.

### **Mystery for Future Generations**

Human memory is still a big mystery. How do we travel back into our own personal past using only our minds?

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