CONVENTION COVERAGE

Keynote Address: Memory and Cultural Evolution

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- APS 16TH ANNUAL CONVENTION (2004)
- CULTURE
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In a statement just short of Darwinian proportion, esteemed psychologist Endel Tulving defined cultural evolution as the result of human memory and forethought during his APS Annual Convention Keynote Address "Memory, Consciousness, and Time."

"Our culture can be produced only by individuals who have a conscious awareness of a future existence in which they or their progeny may survive," said Tulving, an APS William James Fellow Award winner from the Rotman Research Institute and Washington University in St. Louis .

"Our culture can be produced only by individuals who have a conscious awareness of a future existence in which they or their progeny may survive," said APS Fellow and Charter Member Endel Tulving.

Memory, Consciousness, and Time
Endel Tulving
Rotman Research Institute and Washington University in St. Louis

Tulving argued that without the ability to learn from past situations and apply this new understanding to a potential future, the world "would have existed as a natural product of cosmic, geological, and biological evolution." In this sense, culture is the difference between that untainted, theoretical world and our present reality; it is the bustling city where deserts and fields once naturally ruled.

Central to this cultural evolution is episodic memory, a phenomenon of retrospection that allows humans a more complete awareness of a "self." In 1890 William James referred to episodic memory as "memory proper," but the term

was first used in its current form in 1972, when psychological subjects were tested for their ability to recall some learned material. Episodic memory is unique in that it is the only form of memory that involves the past, and it exists only in humans.

Episodic memory has been linked to autonoetic, or self-knowing consciousness, which Tulving characterized as “mental time travel,” or reliving the past.

“Episodic memory allows you to mentally travel in subjective times,” Tulving said. “It probably evolved because it allows humans to contemplate the future, or consider the past, and therefore take steps to prepare for what might come.”

But memory is not alone at the root of cultural evolution. Just as critical to the inception and continued development of culture is the ability to conceive of oneself in the future, known as proscopic chronesthesia. Tulving coined the term and poked fun at its obscurity, claiming that if typed into Google it elicits the response: “Ask Tulving.”

“Episodic memory has played a role in cultural evolution through proscopic chronesthesia.” Tulving said. “Proscopic chronesthesia may have been a central driver of the evolution of culture.”

Among the features distinguishing it from the 160 other kinds of memory, episodic memory “is probably unique to humans.” A monkey may at times look pensive, but Tulving is convinced the animal is not thinking about his previous day’s excitement: “The self he’s aware of exists in the present, probably extending a few minutes in the past and the future,” Tulving said.

In fact, Tulving treated the audience to quite a bit of monkey business. While it would have been enough just hearing the distinguished scientist discuss his research in his own words, Tulving included a number of lighthearted moments. Perhaps the most impressive was when he demonstrated the trickiness of memory with vaudevillian flair by having a gorilla (okay, student Andrew Butler, Washington University in St. Louis, in a gorilla suit) enter the stage. Precisely

choreographed, Tulving never crossed paths with the beast before telling the audience, “You could go home and tell your friends a gorilla walked into Endel Tulving’s lecture. You would firmly believe it, but they would probably think you had one too many the night before.”

A phenomenon closely related to episodic memory — noetic, or knowing consciousness — involves recalling facts of indeterminate origin, such as a name or phone number. This knowledge is retrieved so seamlessly because it is constantly primed. Even at brief and infrequent rates, priming can have such an enduring effect on memory that subjects shown incomplete words were able to identify the actual word even if they had only seen it once six months before.

Tulving’s memory research has centered on patient Kent, who suffers from episodic amnesia but otherwise leads a generally normal life. “ Kent does not remember a single thing that has ever happened to him personally,” Tulving said. “Yet his general knowledge about the world is quite respectable.”

Although he has no episodic memory, and consequently no autonoetic consciousness, Kent ‘s noetic capabilities allow him to very effectively recall entire words from even the scantiest fragments. For example, while a person might typically struggle with the pieces “–e–i–w,” “–ag–bo– –,” and “–c–id– –t,” Kent would quite effortlessly recognize them as “review,” “vagabond,” and “accident.”

Perhaps most interesting from the standpoint of memory research is Kent ‘s inability to project his life into the future, a characteristic that displays how inextricable memory and forethought really are.

There is a caveat to memory’s vast capabilities. “Episodic memory is vulnerable to distortion,” Tulving said. While memory can recall concrete facts even if they are long forgotten, thoughts and images can also be generated without any actual sensory input. This means memory can create a fictional event so precise it merges indistinguishably with reality. Psychologists Marcia Johnson, Beth Loftus, Roddy Roediger, Kathleen McDermott “have demonstrated that perfectly

healthy, intelligent people sometimes remember events that never happened, or remember events as real even if these events were only imagined earlier," Tulving said.

That caveat notwithstanding, it was an unforgettable talk and the perfect start to a memorable convention.