

Un-total recall: Amnesics remember grammar, but not meaning of new sentences

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Syntactic persistence is the tendency for speakers to produce sentences using similar grammatical patterns and rules of language as those they have used before. Although the way this occurs is not well understood, previous research has indicated that this effect may involve a specific aspect of memory function. Memory is made up of two components: declarative and procedural. Declarative memory is used in remembering events and facts. Procedural memory helps us to remember how to perform tasks, such as playing the piano or riding a bike. A recent study suggests that the common phrase, "it's so easy, it's like riding a bike" should perhaps be replaced with "it's so easy, it's like forming a sentence."

In this experiment, Victor S. Ferreira from the University of California San Diego along with Kathryn Bock, Michael P. Wilson and Neal J. Cohen from the University of Illinois at Urbana-Champaign, examined which type of memory function contributes to syntactic persistence by comparing amnesics with a group of control volunteers. The amnesics in this study experience anterograde amnesia and exhibit problems forming new memories—they cannot remember facts & events that occurred following their head injury. However, their procedural memory is still intact. For example, these patients will not remember that they received a new bike, but they will improve at riding the bike.

In this study, controls and amnesics heard a sentence containing a specific grammatical structure (a prime sentence) and were asked to repeat it aloud. Subjects were then shown a picture and had to describe

it. This was followed by a memory test where subjects heard another sentence (a probe sentence) and were asked if it was identical to the prime sentence shown initially. Probe sentences sometimes were identical to the prime sentence, had the same meaning as the prime sentence but a different grammatical structure, had the same grammatical structure but different meaning as the prime sentence or differed from the prime sentence in both grammatical structure and meaning.

The results, reported in the September issue of *Psychological Science*, a journal of the Association for Psychological Science, indicate that both controls and amnesics exhibited syntactic persistence and to the same degree. That is, the sentences that they used to describe the pictures had similar grammatical structure to the prime sentence that they had seen at the start of the experiment.

However, the amnesics were worse than controls at recognizing the sentence they had seen before. During the memory test, control subjects rejected novel sentences more often when they differed from the prime sentence in meaning. When control subjects were presented with sentences which had a similar grammatical structure (although different meaning) as the prime sentence, they were more likely to say that they recognized them. The fact that amnesics did poorly throughout this entire section indicates that they had forgotten the meaning of the prime sentence. However, their descriptions of the pictures indicate that they still retained the grammatical structure of the prime sentence.

These results support the idea that there are two components of language function- one for content and another for structure. The results presented here indicate that the content aspect of language (meaning/semantics) is associated with declarative memory and that the structural aspect of language (grammar and syntax) is associated with procedural memory.

Source: Association for Psychological Science

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