THE TROUBLE WITH MEMORY DISTINCTIONS

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People have an enormous variety of knowledge: for example, there is phonemic, prosodic, syntactic, lexical, semantic, and pragmatic knowledge; there is knowledge about sights, sounds, smells, tastes, feelings, motions, and emotions; there is causal, inferential, procedural, experiential, heuristic, and social knowledge, etc. Between these different forms of knowledge some make one set of distinctions, others make another set of distinctions, and there doesn't seem to be any good way to decide who is right.

Tulving (1972), for example, has made a distinction between episodic and semantic memory, which psychologists have flocked to investigate. But Schank (1975) takes issue with Tulving's distinction, preferring to treat both episodic and semantic memory as part of a conceptual memory, which he distinguishes from lexical memory. Both Tulving's and Schank's distinctions recur throughout history, though with different labels, and are symptomatic of the problem of describing the global organization of memory. I would like to treat them as special cases of the more general problem of deciding to what extent different memory structures are needed for different types of knowledge.

What I understand Tulving to be proposing is that there is an episodic memory, as distinct from semantic memory, which consists of a time-line interpretation of one's experiences. Semantic memory can be viewed as a conceptual memory, distinct from lexical memory so there need be no quarrel with Schank there. In such a scheme concepts in episodic memory must be linked to concepts in semantic memory; presumably to all the concepts that are processed in the course of understanding one's experience.

Tulving's episodic memory is very much akin to Penfield's (1954) notion about an experiential record or Winograd's (1972) event memory, which consisted of a goal stack used to answer "Why" and "How" questions. In the case of Winograd there was also a semantic memory which contained general information about the Blocks World, and a visual memory of sorts in the visual scene he could display and manipulate.

The Winograd example points up the benefits of separate memory structures. Because the event memory is organized temporally according to goals and subgoals, it is well structured to access information and make inferences about the relations between events. Similarly a visual scene is well structured to deal with spatial relations between objects, and a semantic memory is well-structured to deal with property relations between concepts.

The objection Schank has to the distinction between episodic (or event) memory and semantic (or conceptual) memory is that much of people's general world knowledge that would presumably be in semantic memory (for example, knowledge about going camping) is temporal or episodic in structure. So why postulate a separate memory structure to represent it? A striking example is knowledge about history, which is general knowledge in the form of a time-line that does not involve one's personal experience. The point is that any representation of semantic or conceptual memory must have high-level concepts such as going camping or the Civil War. These concepts must include temporal structure of goals and subgoals of the various subconcepts (such as the Western Campaign in the Civil War) that comprise them. Thus the distinction that Tulving was trying to make can not be based on temporal structure.

Tulving also points out a second important aspect of episodic memory: that it relates events that occur to the circumstances in which they occur. If one hears a speech such as Nixon's resignation speech, events that occur in understanding the speech are related to the physical circumstances at the time (aspects of the medium and what the listener is doing simultaneously) as well as a personal evaluation of the source (Ortony 1975). The knowledge in semantic memory on this view is abstracted from the context in which it is learned. For example, the personal aspects of the time line in an episodic memory do not carry over to the time line of history. If you read about the civil war, you may remember that you read about Bull Run on some specific page, but that information is part of the episodic time line and not the abstract historical time line. Episodic memory then is where our knowledge about experiential context is stored.

Here again through an argument similar to Schank's argument with respect to temporal structure can be made. That is to say it is just as important to be able to represent simultaneous context in our general world knowledge as it is in our experiential knowledge. In a representation of the Civil War, for example, we might want to relate what was happening in the Western Campaign to what was happening around Washington, and to Lincoln's feelings and evaluations about successive generals who didn't capture Richmond, etc. There is nothing special about representing simultaneous context that is peculiar to one's personal time-line of experience. There are simply no structural grounds on which you can distinguish semantic memory and episodic memory.

In summary, people must have memory structure that preserves the time line of personal experience and its context, as well as structure that is abstracted from experience. In the brain these two kinds of structure may even be anatomically distinct. But Schank is correct in that all the power for representing temporal structure and simultaneous context must be available in

both kinds of memory. This means you can't tell episodic memory from semantic memory by how the information is organized. But no one, not even Schank, is brave enough to give up the distinction completely. Knowledge is abstracted from experience to a greater or lesser extent, and it is in the cards that a distinction between abstract and experiential knowledge will keep turning up in one form or another. But the distinction is one of content, not of structure.

The next question is whether Schank's distinction between lexical memory and conceptual memory is made of any sturdier stuff? It is based on the age old distinction between words and concepts, but raises it to a distinction between two types of memory. I too (Collins & Loftus, in press) am guilty of making the same distinction to account for Loftus's data (Grober & Loftus, 1974, Loftus & Cole, 1974) that response time to name objects in a category, behaves differently when given a letter descriptor than when given an adjective descriptor. So the distinction between these two types of memory at least has some experimental support. But the trouble is that the distinction melts away in just about the same way as the distinction between episodic and semantic memory, when you look at hard cases.

Brown and McNiell's (1966) study of the tip of the tongue phenomenon showed that when a person can't recall a word like "sextant," but thinks he knows what the word is, he at least can tell you properties of the word (e.g. that it starts with "s," and ends with "ant/d," sounds like "secant"). It seems that the person is searching his lexical memory for the word, and that the information he gives about the word reflects the structure of the memory he uses to access the word. The lexical memory must be something like a network (or space) with words as nodes and ordered phonemes as properties.

In contrast consider a concept like the barking of dogs. The concept of barking must of course include what we might call semantic or propositional properties (e.g. what causes a dog to bark, that barking is one kind of noise a dog makes). But a part of the concept must specify the properties of what barking sounds like. (Actually one must have a range of sounds that barking sounds like.) What we have then is ordered sounds, not unlike phonemes. So the conceptual memory must have the same power for sensory representation as the lexical memory.

Similarly the lexical memory must have the same power for representing propositional information as the conceptual memory. For example, people must be able to represent that the word sextant has seven letters, two syllables, etc. in lexical memory. In these terms words turn out to be a special kind of concept. So if words and concepts must be closely interconnected and must have the same power of representation, why should they be considered to be in separate memories? Again the distinction is based on content (words vs. concepts) rather than on structure.

My suspicion is that if you squeeze any distinction between two types of knowledge hard enough, you will find that the important structural constituents are common to both (as was temporal structure to episodic and semantic memory). This does not negate the distinction; it only means that our knowledge is cut into different shapes from the same cloth. The same thing happens in the domain of living things: when you press the distinction between plants and animals with hard cases like plankton, the distinction breaks down.

Part of the task of describing the organization of memory is to define the distinctions that are important and how they are interrelated i.e., to draw the organizational chart for human knowledge. Another part of the task is to define the structural elements that different memories share, and the structural differences, if there are any, that the distinctions are based on. The trouble with trying to draw the organizational chart for human memory is that it does not appear to have any overall organizing principle, such as evolution, that would produce a clear organizational structure. But then perhaps we are only waiting for our Darwin to come.

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