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Memory construction: a brief and selective history

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ABSTRACT

In this short article, we provide a brief introduction to the idea that memory involves constructive processes. The importance of constructive processes in memory has a rich history, one that stretches back more than 125 years. This historical context provides a backdrop for the articles appearing in this special issue of Memory, articles that outline the current thinking about the constructive nature of memory. We argue that memory construction, either implicitly or explicitly, represents the current framework in which modern memory research is embedded.

KEYWORDS

Memory construction; knowledge representation; false memory; memory accuracy; autobiographical memory

In this short introduction, we give a brief and highly selective overview of the history of memory construction and some of its modern implications. We begin by noting that the idea that memories are constructed rather than simply retrieved has a long history, although it was not until the 1960s and 1970s and later that it became the dominant conceptual framework.[1] One of the first modern theorists to emphasise the constructive nature of memories was the great French neuropsychologist Ribot (1882; see too D'Argembeau et al., this issue). His thoughts on *time compression* in autobiographical memories are especially interesting. Ribot wonders, for example, how can it be that a Chateau he recently visited, a visit that lasted several hours, can now be recalled in a few minutes. The only answer seems to be that somehow his memory is sampled and then constructed into a mental representation that is the memory in that episode of recall.

Bartlett (1932), on the other hand, was not greatly interested in the recall of autobiographical memories – memories of the events of our lives – but rather in what he considered to be the social psychology of memory. One of his main methods for studying this was the repeated recall of culturally specific texts over lengthy retention intervals. Without going into details, his main findings were that as a text from another culture was repeatedly recalled the text changed so that it became more consistent with the culture of the person recalling it. The implication being that the memory had changed to fit that person's culture. Thus, memory alteration in the form of time compression and cultural compatibility are long-acknowledged central aspects of memory construction.

This early work significant though it was, was to be eclipsed by the emergence of cognitive psychology in the 1960s (Neisser, 1967). One of the central questions of cognitive psychology is *how does the mind/brain represent the world?* For memory research, this translates into *how does memory represent experience and knowledge?* The most important early work on this was done by Quillian and his colleagues (see Collins & Quillian, 1969). This group sought to model how information might be represented in memory, however, an important insight was that not everything needed to be or indeed, could be represented. Memory after all, even long-term memory, must have an upper limit on its capacity (Landauer, 1986). The solution was that knowledge should be represented in such a way as to support *inference* (see Brainerd, this issue). So, for example, take a statement such as *Napoleon had toes*. No doubt not directly, or usually, stored in long-term memory, but a fact which can be verified as true by knowing that Napoleon was a man and that men have toes. Collins and Quillian (1969) designed their mental representations of knowledge in long-term memory in terms of hierarchical categories in which items at different levels inherited properties from items higher in the hierarchy and in this way allowed *inference* in memory.

Collins and Quillian's (1969) categories and hypotheses derived from them were repeatedly tested using a procedure called the *sentence verification task*. But the results were mixed and it became clear that mental representations of knowledge were far more complex than initially thought and also that sentence verification was too simple a procedure to capture this complexity (Kintsch, 1988). Subsequently, many other approaches to

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the representation of knowledge were developed, an important early one being that of Rosch (1973) and the many approaches to representations of knowledge that derived from that work.

An important model at the time that aimed to transcend some of the problems of the Quillian approach was that of Anderson and Bower (1973), *human associative memory* or HAM for short. HAM too relied on a verification test, at least to some extent, and suffered from some of the now-familiar problems. There were, of course, other models in the 1970/1980s (see, for example, McClelland & Rumelhart, 1985) all aiming to understand how knowledge was represented in long-term memory (see Berntsen & Nielsen, Cili & Stoppa, Luminet, and McNally, this issue; also see Schacter, this issue, for an overview). It is fair to say that the issue is far from settled. Moreover, it is regrettable that in this flurry of, in the end futile experimentation, the central notion of *inference* somehow became lost. Yet it remains a central aspect of memory construction.

One of the areas where inference is most evident is in autobiographical memories where in all memories at least some knowledge is inferred, most often non-consciously but sometimes consciously (see Otgaar et al. and Berkowitz et al., this issue). Consider for example a person remembering an important job interview, perhaps from several years ago. From the thousands of memory descriptions that have now been collected we can assume that they would recall some specific (experience-near) episodic details, perhaps the rather brilliant reply they made to one of interviewers or alternatively how they talked themselves into a difficult position, perhaps it was hot day and the interview room somewhat airless. Such details are not uncommonly recalled. But do they remember what clothes they were wearing or, indeed, what the interviewers were wearing? This, it seems, is less likely (see Wells et al., 2013). Nonetheless, everyone was undoubtedly fully clothed. These types of details and others too are most probably inferred from associated knowledge structures such as scripts for interviews and other more conceptual, as opposed to episodic, knowledge too (see Schacter as well as Zacks et al., this issue).

Autobiographical memories then are complications of knowledge, constructed during an act of recall, and consist of some experience-near, episodic knowledge (how we do not know but this is most probably related to goals active during memory formation and reconstruction) and more experience-distant conceptual knowledge (e.g., scripts) that act to contextualise the recalled episodic knowledge during memory construction. Which brings us to one of the central questions of autobiographical memory research: Are memories accurate? It should be clear that "accuracy" here is a highly complex notion that does not correspond to everyday meanings of accuracy (see Baddeley, this issue, for discussion). Consider our job interviewee who accurately remembers a telling reply she made to a testing question. But does she remember her exact words? Most probably not, but she does remember the question or at least the *gist* of it and she remembers the *meaning* of her reply. As far as other details of the event, these are most probably non-consciously inferred rather than recalled. In this context, what then does it mean to say that a memory is "accurate" (or, indeed, "basically accurate", as some would have it, whatever those terms might mean). One suggestion is that what is constructed as a memory is consistent, in this case, fairly highly consistent, with what could, should, and perhaps possibly did actually happen (see Baddeley, this issue; and in this sense is at least not "wrong" … whatever "wrong" might mean here). But to take our job interviewee's description as a record of "experienced reality" (which is, in any case, at least one, if not more, steps removed from actual reality) would constitute a major misunderstanding of human memory. Memory construction is about consistency with pre-existing knowledge and only secondarily about "what happened". Although the authors of the articles in the present special issue might disagree with this conclusion it does, we suggest, lie at the heart of the constructive approach to human memory and that constructive approach is present, to varying degrees, in all of the papers that follow. In fact, we would argue that memory construction, implicitly or explicitly, is the current (meta-)framework in which modern memory research is embedded.

Note

1. At least among memory researchers. Writers and thinkers as well as others had been aware of the constructive nature of memory, almost throughout history.

Disclosure statement

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