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What can What–When–Where (WWW) binding tasks tell us about young children’s episodic foresight? Theory and two experiments[☆]

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ABSTRACT

We analyze theoretical differences between conceptualist and minimalist approaches to episodic processing in young children. The ‘episodic-like’ minimalism of Clayton and Dickinson (1998) is a species of the latter. We asked whether an ‘episodic-like’ task (structurally similar to ones used by Clayton and Dickinson) in which participants had to bind What (kind of object), to Where (location of object) to When (temporal duration from present) – WWW-binding – would produce the often-found developmental trajectory in episodic foresight performance of failure at 3 years, transitional performance at 4 and success at 5. Although failure at 3 years was reproduced, the performance of 4 and 5 year olds was likely affected by the executive challenge of inhibiting reference to the currently preferable item.

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A survey of the recent theoretical positions on children’s episodic cognition presents a rather complex picture. On the one hand, there is a division between conceptualist views of episodic abilities that equate episodic experience with ‘mental time travel’ (Suddendorf & Corballis, 1997; Tulving, 2005), meta-representation (Perner, 2001) and introspection (Perner, Kloo, & Gornik, 2007; Perner, Kloo, & Stöttinger, 2007) and, on the other hand, essentially ‘minimalist’ positions. There are two minimalist positions to be found. We call these ‘episodic-like’ minimalism (Clayton & Dickinson, 1998), from comparative psychology, and ‘Kantian’ minimalism (Russell, Alexis, & Clayton, 2010; Russell & Hanna, in press), from developmental psychology.

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This article has two goals: (a) to reflect on and defend these conceptual distinctions as being necessary for understanding varieties of episodic foresight in children, and (b) to ask whether a form of task inspired by Clayton and Dickinson's (1998) work can illuminate the early development of episodic foresight in children. In the latter case, this episodically minimalist procedure might unearth a more primitive form of ability.

We first describe the three theoretical positions, before explaining how the two kinds of minimalism can be applied to episodic foresight. We take the last term to equate to the 'episodic future thinking' of Atance and O'Neill (2001) and of Suddendorf and Corballis (2007) but use it in preference to that term in order to avoid the connotation of complex, step-by-step reasoning processes. We also outline work on episodic foresight inspired by Kantian minimalism (Russell et al., 2010). Finally, we report two studies that employ the episodic-like procedure – What–When–Where or WWW–binding – using a developmental approach.

1. Conceptualist theories of episodic thinking

Tulving (2005, p. 9) writes: "Episodic memory is a recently evolved late developing memory system. . . . [This] makes possible mental time travel through subjective time – past, present, future. This mental time travel allows one, as an "owner" of episodic memory ("self") through the medium of auto-noetic [self knowing] awareness, to remember one's own previous "thought about" experiences, as well as to "think about" one's own possible future experiences. . . . The essence of episodic memory lies in the conjunction of three concepts – self, auto-noetic awareness, and subjective time. "Similarly, Suddendorf and Corballis (2007, p. 299) say: "The most flexible [form of memory] is episodic memory, which we suggest is part of a more general faculty of mental time travel that allows us not only to go back in time, but also to foresee, plan, and shape virtually any specific future event." These are clearly conceptualist views of episodic memory – as part of a cognitive system for moving subjectively through time, in both directions, armed with concepts of self and of temporal sequence.

In a similar vein, and within a developmental context, Perner (2001) proposes that there is something 'second order' about episodic cognition. It is not merely a re-experience of an episode (when of the past) but the re-representation ('meta-representation') of one's own experience conceptualised as such. According to Perner, the recollector does not merely represent an experienced encounter with the world but recollects the episode as personally experienced; to do this the recollector – or indeed future-oriented thinker – must be able to conceptualise the mental state she was in on that occasion, or will be in. This is why, Perner argues, episodic ability, such as that measured by free-recall versus cued-recall performance (Perner & Ruffman, 1995) and by direct-experience versus mediated-experience (Perner, Kloof, & Gornik, 2007; Perner, Kloof, & Stöttinger, 2007), correlates with performance on theory-of-mind tasks such as those tapping the appreciation that seeing leads to knowing and source-of-memory. A form of causal grasp is also implicated in the sense that the episodic recollector must appreciate that her present mental state was caused by the conceptualised past experience.

A third conceptualist view of episodic recall is proposed by Campbell (1994, 1997, 2002), in which the concept of temporal sequence is heavily implicated. On this view, the subject cannot have an episodic memory unless she has a conception of past time as objective and as consisting of subject-independent, particular, causally-connected event sequences. From considerations similar to these, Hoerl (2008, p. 458) suggests that "tensed thought requires a specific form of causal understanding, which animals and young children may not possess." If there is not such tensed thought, Campbell and Hoerl both imply, there can hardly be episodic past or future thinking.

2. Minimalist theories of episodic abilities

The two approaches to episodic abilities to be discussed here are minimalist in the sense that the fewest possible concepts are ascribed to the subject, leaving open the possibility that animals and children lacking adults' sophisticated conceptual apparatus might still exhibit some legitimate form of episodic memory and foresight. Of course, if some known action or object is being recalled – if, that is, there is a semantic element in the memory – this might suggest conceptual abilities; but this will not

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