

## Behavioral and Brain Sciences

### Commentary on Mahr and Csibra: Carving Event and Episodic Memory at Their Joints --Manuscript Draft--

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<b>Abstract:</b>	Mahr and Csibra argue that event and episodic memories share the same scenario construction process. I think this way of carving up the distinction throws the baby out with the bathwater. If there is a substantive difference between event and episodic memory, it is based on a difference in the construction process and how they are organized respectively.

Commentary on Mahr and Csibra

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### **Carving Event and Episodic Memory at Their Joints**

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**Abstract:** Mahr and Csibra argue that event and episodic memories share the same scenario construction process. I think this way of carving up the distinction throws the baby out with the bathwater. If there is a substantive difference between event and episodic memory, it is based on a difference in the construction process and how they are organized respectively.

In the target article, Mahr and Csibra challenge overly cognitive accounts of episodic memory based on the mental time travel metaphor. Instead, they offer a social-cognitive function of episodic memory in terms of an epistemic attitude that signals testimonial authority in human communications. I applaud the proposed shift in focus towards the social-cognitive functions of episodic memory and I suspect that Mahr & Csibra's suggestion may not be the only function of episodic memory in the social domain.

Mahr and Csibra also propose a distinction between event and episodic memory. As they mention, and as I have argued elsewhere (Keven 2016), the distinction has the potential to resolve the long lasting debate about whether episodic memory is a uniquely human capacity. If the distinction is proven to be robust, we can understand the mnemonic abilities of young children and non-human animals with event memory without ascribing them a capacity for full-blown episodic memory. However, it is not clear how to distinguish event and episodic memory at this stage. Mahr and Csibra suggest that event and episodic memory share the same scenario construction process, whereas I think the type of construction involved in episodic memory is *different in kind* from that of event memory.

We can distinguish at least four different types of organization that could be utilized in memory reconstructions:

**1. Spatial Organization:** We perceive the world in a spatially organized way and can recall our experiences as such.

**2. Temporal Organization:** Experiences occur sequentially in time such as before or after another event. When we reconstruct an experience from memory, the events should occur in their proper place in the sequence.

**3. Causal Organization:** Events can be distant in time and yet can have causal connections with each other. I remember that I missed my bus to Istanbul because my alarm didn't ring. Missing the bus and the malfunctioning alarm clock are two temporally distant events that are causally connected in my memory reconstruction.

**4. Teleological Organization:** Temporally distant and causally disparate events can still be connected with each other based on goals. For instance, I remember that I was going to give a talk when I missed the bus, so I took a plane instead to get there in time. Although giving a talk is temporally distant and causally disparate from the malfunctioning alarm clock and missing the bus, it is still connected to them in my memory as my goal at the time.

In Mahr and Csibra's view, both event and episodic memory involve construction of a scenario that involves simulation of events that are extended in time and space. It is not clear whether these simulations involve all of these four types of organization. If they want to maintain that young children and other non-human animals have event memories, however, then there has to be some differences in the construction of event and episodic memories. Even though there is some evidence

that nonhuman animals can be sensitive to temporal information (e.g. Clayton and Dickinson 1998; Babb and Crystal 2006), it is far from clear whether this amounts to an ability to temporally sequence events into before/after relations (McCormack and Hoerl 2011; Roberts and Feeney 2009). Moreover, causal understanding of our primate cousins is very limited and no nonhuman animals seem to understand the behavior of others in terms of goals (Povinelli 2000; Penn and Povinelli 2007; Penn et al. 2008; Visalberghi and Tomasello 1998; Tomasello et al. 2005). Similarly, young children show less temporal sequence knowledge and omit causal relations between events in their recall of novel experiences; and, their memory representations are not organized around goals to the same extent as are older children's and adults (e.g. Price and Goodman 1990; Ratner et al. 1986). So, it is unlikely that event memories in young children and nonhuman animals can involve temporal, causal and teleological organization.

In my previous work (Keven 2016), I provided evidence and argued to carve up event and episodic memory in a different way. According to the dual systems thesis that I proposed, event memory is a snapshot like memory system based on perceptual processes predominantly in the form of visual images. These perceptually grounded representations are highly accurate but short-lived. Construed as such, event memories only involve spatial organization. Any other type of organization is not necessary in this case as there are no series of events that are extended in space and time.

On the other hand, construction of episodic memories requires a higher order *inferential process*. Episodes generally consist of a series of events that are extended across different times and places. When I remember the missing-the-bus episode, I don't remember all the minute details involved in the actual experience, I only remember the causally and teleologically relevant ones in the right temporal order. In order to connect such a series of events, the construction process needs to sort the events into cause/effect and goal/attempt/outcome relations besides keeping track of each scenes' spatial structure and the events' temporal order. Organizing memories in this way requires making higher order inferences on the relations between events from memory as these relations are not directly observable. According to the dual systems thesis, this inferential process is closely tied to our storytelling capacity and narrative has nearly all the organizational components one would expect. Reconstructing a narrative version of the experience provides the required temporal, causal and teleological organization. As such, episodic memories are low in accuracy but can span longer timescales and are more memorable.

To sum up, when we consider different types of organization that can be utilized in memory

reconstructions, construction of event and episodic memories differ in kind. In particular, the construction of episodic memories require a higher order inferential process, which is unlikely to be found in event memories.

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