

listeners' motivation to relate to an in-group member impacted the degree to which they concurrently retrieved the information with their fellow in-group member.

These phenomena have consequences for both conversational partners. If the speaker and the listener strengthen similar memories and they both experience suppression of the undiscussed related information, then their memories will become more aligned following collaborative remembering, as found by Stone et al. (2010) and Coman and Hirst (2012). And having similar memories could impact people's sense of shared identity (Fivush 2010a), their ability to make collective decisions (Kameda et al. 1997), and their collective behavior (Harris 2006). So adaptive memory systems constitute the building blocks of social formations (Coman 2015). This view goes beyond simply acknowledging that we communicate our memories and emphasizes the *why* of communication, which might constitute a more proximal explanation for the malleability of human memory.

Expanding the communicative dimension that characterizes our episodic memories from its epistemic function to its relational function will result in a more complex view of human memory. The reason why we have the flexible memory systems that we do is because this allows communicating individuals to create a shared reality or worldview (Hardin & Higgins 1996). Through its impact on group identity and collective coordination, the ability to create a shared reality with others might have provided selective advantages in the evolution of the human species.

Why episodic memory may not be for communication

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Felipe De Brigard^{a-d} and Bryce Gessell^a

^aDepartment of Philosophy, Duke University, Durham, NC 27708; ^bDepartment of Psychology and Neuroscience, Duke University, Durham, NC 27708;

^cCenter for Cognitive Neuroscience, Duke University, Durham, NC 27708;

^dDuke Institute for Brain Sciences, Duke University, Durham, NC 27708.

felipe.debrigard@duke.edu www.imclab.org
bryce.gessell@duke.edu www.emps.me/bryce

Abstract: Three serious challenges to Mahr & Csibra's (M&C's) proposal are presented. First, we argue that the epistemic attitude that they claim is unique to remembering also applies to some forms of imaginative simulations that aren't memories. Second, we argue that their account cannot accommodate critical neuropsychological evidence. Finally, we argue that their proposal looks unconvincing when compared to more parsimonious evolutionary accounts.

Mahr & Csibra's (M&C's) article is full of thought-provoking ideas but also contains serious conceptual and empirical difficulties. Here we articulate three challenges that may severely undercut M&C's claim that remembering is for reason-giving communication. The first challenge is conceptual. According to M&C, episodic memory consists of an epistemic attitude to the effect that the content of the mental simulation provides us with information that has been obtained firsthand. However, there are certain kinds of mental simulations that provide us with firsthand information and yet wouldn't qualify as episodic memories. Consider the following case. You are snowboarding down a steep hill and nearly avoid a pine tree you somehow failed to notice. An immediate, involuntary counterfactual simulation comes to mind: "Had I been a meter to my right," you think, "I would have been dead now." This automatic "subjunctive replay," as Hofstadter (1982) playfully calls it, provides us with firsthand information as to what would have happened had a minor deviation from reality occurred instead of what actually was the case.

Indeed, some philosophers have argued that these kinds of imaginative simulations constitute knowledge (e.g., Williamson

2007; 2016). Nevertheless, you wouldn't say that you remember hitting the tree a minute ago: You just imagined it could have happened. Therefore, it looks as though there is a species of episodic counterfactual simulation (De Brigard 2014a; De Brigard & Giovanello 2012; De Brigard et al. 2013) that is quasi-experiential, event specific, epistemically generative, autozoetic, and past-directed that nonetheless is not a memory. Perhaps M&C could defend their account by arguing that because these kinds of episodic counterfactual simulations do not represent actual past events but rather closely possible past events, they fail to meet the past-directedness requirement of episodic memories. But this response won't do, for the same occurs with many of our ordinary reconstructed memories, as they normally represent past events with some degree of deviation from what actually happened in the past. An account of episodic memory that cannot include these normally distorted reconstructed memories would fail to capture the psychological reality of remembering.

Their proposal also faces serious empirical challenges. First, if episodic memory is for a particular kind of reason-giving communicative interaction, as M&C claim, then we should expect to see individuals with episodic memory deficits – for instance, patients with amnesia due to medial temporal lobe damage or individuals with severe depression – exhibiting difficulties when carrying out such communicative interactions. Unfortunately, not only do M&C fail to provide neuropsychological support for this observation, but also there seems to be enough evidence against its being the case. For example, patient HM, a notoriously famous case of episodic autobiographical amnesia, did not seem to have trouble engaging in all sorts of reason-giving communications about past events, as long as these events were in the recent past and HM was able to entertain them in working memory (see Corkin 2013 for plenty of examples of these sorts of reason-giving communicative exchanges between HM and others).

Of course, HM had trouble generating reasons whose contents depended on his capacity to bring back to mind *remote* past events. But this just shows that episodic memory is *necessary* for generating some contents – that is, contents about remote first-person past experiences – that may feature in reason-giving communicative exchanges about the past; in no way does it show that such is its function. HM's machinery to engage in the communicative reason-giving transactions, which M&C claim that remembering is for, was, in fact, intact. What HM lacked was the capacity to generate the contents that would feature in a subset of such reasons, namely, those about remote past experiences. Failing to generate mental contents that can feature in reason-giving communicative interactions is, at best, very weak evidence for saying that the psychological process that produces such contents evolved for the purpose of reason-giving communication. Consider an analogy: cortically blind people cannot generate visual contents that could feature in reason-giving exchanges about objects in their visual field. Should we take this as evidence for the claim that vision evolved so we can engage in reason-giving exchanges with conspecifics about objects in our visual field? This claim seems preposterous, even for evolutionary psychology.

The final challenge we put forth is somewhat related. It is reasonable to suppose that, with the development of language and complex social interactions, humanity faced a new fitness problem: how to keep track of others' assertions and testimonies. Because such assertions and testimonies often involved past events, it seems reasonable that humans developed strategies to temporarily keep track of the veracity and reliability of people's assertions and testimonies. From the pressure to exercise this sort of "epistemic vigilance" onto others – M&C argue – arose episodic memory. But why should this particular kind of tracking be that for which episodic memory evolved? After all, our ancestors presumably had to temporarily track all sorts of different items that were critical for survival: predators, poisonous plants, dangerous areas, glucose rich fruits, and so on. Wouldn't it be more reasonable to say that episodic memory evolved to help us keep track of such fitness-enhancing items, and that once there, our ancestors

were able to capitalize on an already available system for temporal tracking of past events and redeploy it to track, among other things, assertions and testimonies? It seems very unlikely that the fitness-enhancing item episodic memory evolved for was something as culturally dependent and as phylogenetically recent as reason-giving assertions and testimonies. It seems much more parsimonious to think that this kind of tracking came about because we already had the kind of episodic memory that allows us to track fitness-enhancing stuff in general, of which conspecifics' reliable testimonies are just one part.

Remembered events are unexpected

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Jean-Louis Dessalles

LTCI, Telecom ParisTech, Université Paris-Saclay, F-75013 Paris, France.
dessalles@telecom-paristech.fr www.dessalles.fr

Abstract: We remember a small proportion of our experiences as events. Are these events selected because they are useful and can be proven true, or rather because they are unexpected?

Remembered events are universally and massively recounted during spontaneous human conversation. Despite early studies (e.g., Tannen 1984), the importance of the phenomenon has long been ignored: It occurs only among people who are already acquainted, and it is absent from most corpora recorded in the lab (Norrick 2000). According to some figures, telling past events may represent up to 40% of conversational time (Eggs & Slade 1997, p. 265). Measures I made through a sampling method on a corpus of family conversation (about 18 hours recorded during 3 years) resulted in the following estimates: 27% of conversational topics consisted in narratives about past events, while another 12% were about current events (Dessalles 2017). Although these proportions are expected to vary significantly depending on the corpus, they indicate that talking about events constitutes one of the main human activities. Is the prevalence of this form of communication consistent with Mahr & Csibra's (M&C's) claims about the role of episodic memory?

If the main function of episodic memory is communication, as M&C propose and as I myself submitted (Dessalles 2007a), episodes get stored in memory just to be used during future conversations. This comes with a significant cost, if we consider that the large size of the brain sustained by humans is in part due to the need of making detailed retrieval of events possible (Suddendorf & Corballis 2007). The benefit must be substantial to match this cost. What does this benefit consist of?

According to M&C, communicating about events gives senders an opportunity to induce "in their audience a representation of the past that is to their benefit" (sect. 3.2.3, para. 1). My study of spontaneous conversations does not support this schema. I have been unable to detect clear self-promotion in the narratives of my corpus or in other corpora. On many occasions, the converse can be observed (Rimé 2005). People do not hesitate to tell events in which they performed inappropriate actions. In Norrick's corpus, for instance, a narrator explains that she was hired at a Burger King restaurant for her first job. She was trained during one week, and then, as she was about to take her very first order from a customer, she said into the microphone "Welcome to McDonald's!" (Norrick 2000, pp. 30–31).

Another advantage of storing events, in M&C's view, is that past events can be used as justification during debates and are themselves designed to resist epistemic attacks. Indeed, narratives may be used as arguments during discussions, and conversely, inconsistencies may be pointed out when a narrative is told. But these phenomena remain marginal. In the aforementioned analysis (Dessalles 2017), only 16% of the narratives have a logical connection with the previous topic, and only 5% of the discussions are

triggered by a narrative. Most narratives are connected to a preceding narrative topic through close analogy (42%) or through mere association (26%). The mention of a past event tends to prompt another, related narrative. This phenomenon has been named *story rounds* (Tannen 1984, p. 100). Narratives have their own dynamics, distinct from debating. If past events surface so often in human conversation, it must be for some reason other than their epistemic value.

If remembered events were selected for their epistemic robustness, we would prefer events for which evidence is available and can be produced on demand. "I flew from Boston to Paris on June 13, 2006" is such an event. But this episode together with the associated details is unlikely to be worth remembering or worth telling in most contexts, regardless of its epistemic solidity. In earlier work (Dessalles 2007a), I suggested that *events that are memorable are exactly those that are narratable*. And we know what makes an event narratable: It has to be *unexpected*, that is, it has to be causally complex but conceptually simple (complexity and simplicity here refer to minimal description length – see www.simplicitytheory.science). In the Burger King story, the mention of the competitor is both conceptually simple (it is the best-known competitor) and causally complex (it was the last thing to say). The Boston–Paris example would have been more unexpected with a simpler date: "I flew from Boston to Paris on September 11, 2001" but less unexpected if the action was less complex to produce: "I had breakfast on September 11, 2001." One can play with these two qualities – causal complexity and conceptual simplicity – to predict what will be remembered; their combined effect makes some events unforgettable for an entire life.

If events are remembered and told based on their unexpectedness, does it match the audience's interest? According to M&C, "receivers are interested in acquiring useful (i.e., true) information" (sect. 3.2.3, para. 1). Narratives are, however, ill-designed to convey useful knowledge. Memorized events are selected to be unexpected, not to be consequential. Most conversational narratives are indeed about futile matters, such as oddities or coincidences. In the case of fiction, the audience accepts giving up truthfulness and even likelihood just to enjoy being surprised by unexpected events. Nevertheless, we may wonder why, as M&C observe, it is still important for a reported past event to be regarded as true. Is it because the audience wants to draw general lessons from it? There is a better explanation. Unexpectedness depends on causal complexity, and causal complexity crucially depends on the story being true. If I am lying about my Boston–Paris flight on 9/11, the false event loses its causal complexity (because it did not really happen) and turns out to be devoid of interest.

Episodic memory is geared to supply human beings with unexpected events worth telling. In our species, producing unexpectedness is crucial for having a chance of attracting friends (Dessalles 2014). The question of reliability is subordinate to the criterion of unexpectedness. We select a tiny proportion of our experiences and we remember them, not because they are true, but because they are unexpected.

Sleep to be social: The critical role of sleep and memory for social interaction

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Susanne Diekelmann,^{a,1} Frieder M. Paulus,^b and Sören Krach^{b,1}

^aInstitute of Medical Psychology and Behavioral Neurobiology, University Tübingen, 72076 Tübingen, Germany; ^bDepartment of Psychiatry and Psychotherapy, Social Neuroscience Lab | SNL, Lübeck University, Center of Brain, Behavior and Metabolism (CBBM), 23538 Lübeck, Germany.

susanne.diekemann@uni-tuebingen.de

http://www.medizin.uni-tuebingen.de/en/Research/Institutes/Medical+Psychology/Staff/Diekemann_+Susanne_+Dr_+port-80-p-68596.html