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From Phenomenology to Traces: Inferring Memory Mechanisms

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> **Abstract** • By providing a detailed account of the phenomenology of accurate and inaccurate recall, Černe and Kordeš offer a rich and much-needed account of memory's constructive nature. Their results amplify growing concerns about the nature and significance of the remember-know distinction, but also suggest that there is more differentiation in the underlying mechanism than either they or traditional constructivist accounts have acknowledged.

« 1 » In *Deconstructing Accurate and Inaccurate Recall in the DRM Paradigm: A Phenomenological and Behavioral Exploration*, Jaša Černe and Urban Kordeš propose a new approach to the DRM paradigm (Deese 1959; Roediger & McDermott 1995). The DRM paradigm studies false memory through word lists. Still, the task is not purely semantic: it involves the participants' ability to recall the experiences or events in which they learned a word list, i.e., *episodic memories* (Robins 2016). The DRM's episodic aspect is often neglected. Černe and Kordeš emphasize it and build it into their experimental procedure: participants are asked to recall their learning experiences and, importantly, to report on the phenomenology of recall.

« 2 » Considering the constructivist turn in the philosophy and science of episodic memory, this focus on phenomenology is needed. Claims that episodic memory is constructive are frequent, but accounts of what construction is and of what elements it involves are scant (Robins 2023). Studying what memories look and feel like in awareness is crucial. One might indeed argue that differences and similarities in the subjective markers of recall correlate with differences and similarities in the mechanisms that produce different types of memories. Studying the phenomenology of recall is a key route to understanding memory construction (§95). Here we focus on two aspects of the target article that we consider especially relevant for doing so: the *remember vs know* distinction and the *inferential vs entity-driven* recall.

Remember vs know

« 3 » In line with previous research on false memory, Černe and Kordeš tested the feelings associated with accurate and inaccurate recall: recollection, familiarity, etc. Philosophers treat these feelings as epistemic and metacognitive in kind (Perrin, Michaelian & Sant'Anna 2020): by providing clues about an epistemic property of recalled memories – accuracy – they provide clues about how these memories came about – i.e., the mechanisms of memory construction.

« 4 » These feelings are usually studied through the remember/know paradigm, which involves directly asking the participants if they *remember* seeing the word that they are recalling or if they merely *know* that that word was in the original list they studied (Mather, Henkel & Johnson 1997). Černe and Kordeš used a different methodology: they asked the participants to report on their experience of recall, guided by open questions posed by the experimenter (§21). Their key finding is that the participants' first-person reports do not align well with the remembering/knowing distinction (§78) for two reasons (Supplementary Material C):

- When recalling words from the lists, participants used linguistic markers associated with certainty and uncertainty. When experiencing an accurate memory, one participant said: "I could describe this feeling of certainty as some feeling [… that] is grounded or something" (§1.5). Another participant reported that they felt "some sense of awareness or a sense of certainty that many words are accessible to me" (§2.4). And, when constructing an inaccurate memory, a participant said that they were not quite sure of their own process of recall (§1.4).

- The study reports a case in which accurate recall involved the feeling of knowing: the participant reported that when they heard that word, they immediately *knew* that it was the word they were looking for (§1.3).

« 5 » These findings resonate well with recent critiques of the remember/know paradigm, and in particular with a recent study by Sharda Umanath and Jennifer Coane (2020). In that study, Umanath and Coane investigated how cognitive psychologists and laypeople use the terms "remembering" and "knowing" in natural language contexts. Their results showed that experts considered recollection and familiarity as markers of remembering and knowing, respectively, but laypersons did not. They caution researchers to consider ways in which interpretations of participants' responses might impose the experimenters' categories, misinterpreting the participants' experience.

« 6 » In short, since the first-person reports of the feelings associated with accurate and inaccurate recall do not align well with the remember/know distinction, we should be careful when we use results

from empirical studies to make inferences from metacognitive and epistemic feelings to the mechanisms of memory construction. Černe and Kordeš's study moves this line of critique further forward: the feelings involved in accurate and inaccurate recall must be more fully studied and understood. As also other research does (Williams & Lindsay 2019), their study encourages broadening the scope of subjective markers of recall beyond feelings of recollection and familiarity to include different degrees of certainty. Still, since Černe and Kordeš studied many more markers (tendency to rush, flow of recall, concern, etc.), one may ask: Do degrees of certainty have a special status or are they just some markers among others equally important? Q1

Inferential vs entity-driven recall

« 7 » Černe and Kordeš strive to draw mechanistic conclusions from their study of DRM phenomenology. In their conclusion, they highlight the number of phenomenological indicators observed in cases of both accurate and inaccurate recall – 16 of the 22 identified – suggesting that both rely on an underlying mechanism governed by constructive processes (§95). While their results do highlight memory's constructive elements, they also identify significant distinctions amongst phenomenological indicators. Accounting for this aspect of their findings requires acknowledging a distinction in the underlying mechanisms as well, one that is likely to require more structure and individuation in memory than is easily incorporated in their broadly constructivist position:

- The significance of the overlap in phenomenological indicators is difficult to assess without a more complete picture of these phenomenological reports. It would be helpful to know, for instance, how the overlap in indicators between accurate and inaccurate cases compares to baseline levels of overlap between phenomenological indicators on other tasks. Perhaps most recall and decision-making tasks overlap on roughly half of their features, leaving only a few indicators to mark critical distinctions amongst them.
- There is no discussion of how the number or overlap of indicators differed

across participants. It is possible that the bulk of overlapping features are due entirely to one or two participants.

- More significantly, Černe and Kordeš focus their phenomenology-to-mechanism inference on the overlapping indicators. They do not discuss any phenomenology-to-mechanism inferences that could be drawn from the distinctions amongst indicators that their results also show.

« 8 » Černe and Kordeš refer to the process of recalling a word from the list as "concept emergence" (§54). Their analysis of participants' phenomenological reports identifies distinct phenomenological indicators of accurate and inaccurate recall. In some cases, participants described concept emergence as occurring in a direct and concrete way, as is shown, for example, in this verbal report: "I […] pulled from this blurry mental image a picture of the south-western part of Slovenia, which reminded me that *Piran* was on the list" (Supplementary Material C: §1.2). Such phenomenological reports were most strongly associated with accurate recall. In other cases, participants reported phenomenology based in general reasoning: they made inferences about the memory they constructed based on the general meaning of the whole word list or based on the words they previously recalled (§56). For example, when constructing a memory of the critical lure (window), a participant reported this: "I was more like inferring and logically arriving [at this …]: *window* is one of these words" (Supplementary Material C: §2.11). Such inferential reports were a phenomenological indicator of inaccurate recall.

« 9 » This difference in the phenomenology of accurate and inaccurate memories depends on dynamics that are internal to the participants. Černe and Kordeš's study is designed to test free recall, without cues from the experimenter or variations in context. Differences observed across reports must therefore be explained by appeal to dynamics within the participant. Their findings are at least consistent with the idea that many cases of accurate recall are guided by distinct, stored memories. In such cases, this memory trace plays a critical role in concept emergence. In other cases, when no such trace is available, there is greater reliance on constructive, inferential processes.

« 10 » Given their stated commitment to a constructivist view of memory, it seems unlikely that Černe and Kordeš will want to endorse this appeal to memory traces to explain the difference. Our interest here is to highlight that the authors have yet to provide an alternative proposal. Memory traces may rarely, if ever, act in isolation from wider sets of cognitive, emotional, and contextual dynamics (Caravà 2021). The authors acknowledge this point (§96). In response, we want to emphasize that this acknowledgment is consistent with the idea that, at least in some cases, memory construction relies on *sub-personally stored memory traces* (e.g., Robins 2016). Sub-personally stored traces – we argue – provide a compelling explanation of why there is a distinct element to the phenomenology of accurate and inaccurate memory after the cognitive, emotional, and contextual dynamics are held constant. This distinct phenomenology includes the subjective feeling of being guided by a memory trace during memory construction in cases of accurate recall, and the feeling of being guided by inference in cases of inaccurate recall (§42; §54). The question in need of an answer is: How does a broadly constructive mechanism account for the certainty and trace-guidance of accurate recall and for the lack of such phenomenological aspects in inaccurate recall? Q2 If phenomenological similarities offer insight into the nature of the underlying mechanism, as the authors suggest (§95), then so too do phenomenological differences.

Contribution statement

The authors have contributed to the conceptualization, writing, and revision process equally.

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Fluency and the Inaccuracy of Recall

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>Abstract · We focus on a couple of issues that are prompted by erne & Kordeš's discussion of flow of recall as a phenomenological indicator of the inaccuracy of recall and on how they see the relationship between this result and existing work on fluency. We make two theoretical distinctions concerning the role played by fluency in recall that are needed to better assess that relationship. We argue that once these distinctions are in place, it is no longer clear whether there are any major tensions between existing work on fluency and the idea that flow of recall is associated with the inaccuracy of recall.

« 1 » The main goal of Jaša Černe & Urban Kordeš's (Č&K) article is that of identifying phenomenological indicators of accurate and inaccurate recall in the context of the DRM paradigm. To do so, the authors rely on methods from "empirical phenomenology" (§9), which offer a fresh perspective on ongoing psychological research on memory. In our commentary, we will focus on a couple of issues that are prompted by Č&K's discussion of flow of recall as a phenomenological indicator of the inaccuracy of recall and on how the authors see the re-

lationship between this result and existing work on fluency.

« 2 » According to Č&K, flow of recall comprises a group of phenomenological features that, as suggested by their findings, is associated with inaccurate recall (§60). As they put it,

> *flow of recall* refers to a recall where a participant is deeply focused on the task (*immersion*) and the words typically arise one after another, automatically, quickly, and fluidly, without a clear division between them (*codependent emergence*). Importantly, before one concept emerges fully, there is already a sense that more concepts are readily available (*more words are accessible*) with a strong tendency to move on to the recall of another concept (*tendency to rush*). (§60; italics in the original)

« 3 » When discussing potential (in)consistencies between their results and existing work, Č&K note that the finding that flow of recall is associated with inaccurate recall highlights a potential tension with existing work suggesting that two phenomenological features central to flow of recall – fluency and immersion – are "typically associated with performance accuracy, not inaccuracy" (§85). With regard to fluency in particular, Č&K observe that a tension may arise in connection with the idea – which they attribute to Bruce Whittlesea and Jason Leboe (2000) – that content previously entertained by a system tends to be processed more fluently when recalled, and, as a result, to be treated by subjects as content that is accurately recalled.

« 4 » We think that there are two issues with this way of seeing the role of fluency in recall. We shall argue that once these issues are identified and clarified, it is no longer clear whether there are any major tensions between existing work on fluency and the idea that flow of recall is associated with the inaccuracy of recall.

Procedural fluency and phenomenological fluency

« 5 » The first issue is related to the distinction between fluency as a *procedural* feature of recall and fluency as a *phenomenological* feature of recall. Understood as a procedural feature, fluency refers to the relative ease with which a certain cognitive