



The effect of cue content on retrieval from autobiographical memory

Tugba Uzer^{a,*}, Norman R. Brown^b

^a TED University, Turkey

^b University of Alberta, Canada

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ABSTRACT

It has long been argued that personal memories are usually generated in an effortful search process in word-cueing studies. However, recent research (Uzer, Lee, & Brown, 2012) shows that direct retrieval of autobiographical memories, in response to word cues, is common. This invites the question of whether direct retrieval phenomenon is generalizable beyond the standard laboratory paradigm. Here we investigated prevalence of direct retrieval of autobiographical memories cued by specific and individuated cues versus generic cues. In Experiment 1, participants retrieved memories in response to cues from their own life (e.g., the names of friends) and generic words (e.g., chair). In Experiment 2, participants provided their personal cues two or three months prior to coming to the lab (min: 75 days; max: 100 days). In each experiment, RT was measured and participants reported whether memories were directly retrieved or generated on each trial. Results showed that personal cues elicited a high rate of direct retrieval. Personal cues were more likely to elicit direct retrieval than generic word cues, and as a consequence, participants responded faster, on average, to the former than to the latter. These results challenge the constructive view of autobiographical memory and suggest that autobiographical memories consist of pre-stored event representations, which are largely governed by associative mechanisms. These demonstrations offer theoretically interesting questions such as why are we not overwhelmed with directly retrieved memories cued by everyday familiar surroundings?

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1. Introduction

For the past several decades, researchers interested in autobiographical memory have assumed that people typically use a *generative* or *re-constructive* strategy when they recall personal memories in response to cue words or phrases (Addis, Knapp, Roberts, & Schacter, 2012; Addis, Wong, & Schacter, 2007; Conway, 2005; Conway & Loveday, 2010; Conway & Pleydell-Pearce, 2000; Conway et al., 1999; Haque & Conway, 2001; Moscovitch, 1992; Norman & Bobrow, 1979; Reiser, Black, & Abelson, 1985; Reiser, Black, & Kalamarides, 1986; Robinson, 1976; Williams et al., 2006; Williams & Hollan, 1981). On this view, the intentional cued retrieval process is characterized as being deliberate, effortful, and time-consuming. A recent study has challenged this position (Uzer, Lee, & Brown, 2012). This research, which made use of *retrieval times* (RTs) and strategy reports, demonstrated that: (a) participants frequently retrieve memories within a few seconds of reading a cue word; (b) participants often indicate that retrieved memories have come “directly to mind;” and (c) there is a strong, explicable, relation between RT and retrieval strategy – on average, RTs were much slower when participants indicated they had generated or reconstructed an event memory than when they indicated that the memory had

been directly retrieved. We note that two recent studies have replicated this pattern of results (Harris, O'Connor, & Sutton, 2015; Jeunehomme & D'Argembeau, 2015). In addition, Harris et al. (2015) reported that field perspective ratings are somewhat higher for directly retrieved memories than generated ones. As for Jeunehomme and D'Argembeau (2015), they found that direct retrieval was just as common when participants were recalling future event memories as when they were recalling past event memories and that most event memories that were produced directly had been considered on previous occasions.

These findings, along with those reported in the involuntary memory literature (Ball & Little, 2006; Berntsen, 1996, 1998, 2007, 2009, 2010; Berntsen, Staugaard, & Sørensen, 2013; Rasmussen & Berntsen, 2011; Rasmussen, Ramsgaard, & Berntsen, 2015; Berntsen & Hall, 2004; Mace, 2005, 2006, 2007, 2010; Schlagman & Kvavilashvili, 2008; Schlagman, Kvavilashvili, & Schulz, 2007; Staugaard & Berntsen, 2014), imply that the representations underlying individual event memories are, for the most part, pre-stored. At the same time, this research suggests that the generation process, when it is used, involves the search for a cue or a set of cues capable of triggering one of these pre-stored representations (Addis et al., 2012; Conway, 2009; Morton, Hammersley, & Bekerian, 1985; Norman & Bobrow, 1979; Whitten & Leonard, 1981; Williams & Hollan, 1981).

The present study extends this prior research in two ways. First, across two experiments, we compare direct-retrieval rates observed when participants are cued with conventional word cues (e.g., cup) to

* Corresponding author at: Department of Psychology, Ziya Gokalp Cad. No: 48, TED University, Cankaya, Ankara 06420, Turkey.

E-mail address: tugba.uzer@tedu.edu.tr (T. Uzer).

those obtained when the cues are personally-relevant (e.g., the names of friends). Second, we perform a content analysis on the retrieved memories to determine whether there is a relationship between memory specificity and RT and/or retrieval type.

Concerning the first issue, our expectation was that personally-relevant cues would produce more direct retrieval than conventional word cues. This prediction is based on three assumptions. The first was that direct retrieval typically requires strong association between a cue and an event memory (Berntsen, 2009, 2012; Rasmussen & Berntsen, 2009). The second was that each accessible event memory is represented by a bound set of event components, and the third that these components typically refer to repeatedly encountered people, places, and things and recurring activities (Barsalou, 1988; Brown, Hansen, Lee, Vanderveen, & Conrad, 2012; Brown, Schweickart, & Svob, 2016; Conway, 2009; Lancaster & Barsalou, 1987; Linton, 1986; Morton et al., 1985; Shimamura, 2014).

On this view, direct retrieval should be very common when participants are presented with personal-relevant cues because the event components identified by these cues should often be linked to accessible event memories. In contrast, the word cues used in this study, and many others, are generic in nature. This means they do not typically single out individuated event components and hence do not necessarily provide direct access to specific event memories. Of course, it is possible for generic concepts and specific event memories to be associated with one another, particularly when the event is distinctive and affect-laden (e.g., “window” cuing “I broke the kitchen window with a foul ball in the 4th grade”; Conway, 1990; Crovitz & Schiffman, 1974; Fitzgerald & Lawrence, 1984; Linton, 1986; Robinson, 1976, 1981, 1992). It also seems likely that some generic concepts are readily interpreted in specific terms, particularly when participants are in retrieval mode (Tulving, 1983). For example, “dog” might immediately bring to mind “my dog Molly,” and “automobile” “my Yaris.” Thus, although we expected that personal cues would elicit more direct retrieval than conventional word cues, this prediction is not inconsistent with the finding that direct retrieval is common when people are cued with concrete nouns (Uzer et al., 2012).

In addition, it is important to note that autobiographical memories are subject to forgetting, schematization, and interference (Barclay, 1986; Baddeley & Wilson, 1986; Barnier, 2002; Barnier, Hung, & Conway, 2004; Barnier & McConkey, 1999; Bartlett, 1932; Christianson & Endelberg, 1996; Geraert & McNally, 2008; Stone, Barnier, Sutton, & Hirst, 2013; Wagner, 1996). Moreover, despite being surrounded by personally-relevant cues (i.e., the people, places, and activities that constitute the fabric of our daily lives), we are not overwhelmed by involuntary memories (Berntsen, 2009, 2010; Rasmussen & Berntsen, 2009). Taken together, these observations suggest that processing personally-relevant cues does not always result in the direct retrieval of an autobiographical memory, nor should it. Thus, although we predicted that personally-relevant cues would produce more direct retrieval than generic cues, we also had reason to believe that participants might sometimes rely on generative strategies, even when responding to personal cues.

In addition to examining the effect of cue type on retrieval strategy, we report a content analysis that focuses on the specificity of the retrieved memories. These data are of interest because they make it possible to test an alternative account of the dual-strategies findings described above. The alternative assumes that people typically reconstruct event memories from recently accessed retrieval indices and related fragments of event specific knowledge, and that this reconstructive process must access information about lifetime periods and general events before it accesses specific event knowledge (Addis et al., 2012; Conway, 2005; Conway & Bekerian, 1987; Conway & Pleydell-Pearce, 2000; Haque & Conway, 2001; Schooler & Hermann, 1992; Sumner, 2012; Williams, 1996; Williams & Dritschel, 1988). If event retrieval follows this sequence, people should have information about general events before they have information about specific events (Haque & Conway,

2001; Hauer, Wessel, Geraerts, Merckelbach, & Dalgleish, 2008; Williams et al., 2007; Williams, Healy, & Ellis, 1999). Thus, this position implies a strong relationship between RT and the specificity; rapid responses should, for the most part, consist of general event memories, whereas slower responses should, for the most part, consist of specific event memories.

It could be that this alternative account is correct. If it is, and assuming that strategy judgments are based on the retrieval speed rather than on accurate information about just-completed retrieval processes, (cf. Ericsson & Simon, 1993; Nisbet & Wilson, 1977), then retrieval type and specificity should still be related. In particular, this position predicts that general-event memories should be common and specific-event memories rare on direct-retrieval trials (which tend to be fast), and that the opposite should be true on generative trials (which tend to be slow).

In contrast, if the process-data reported (Barzykowski & Staugaard, 2015; Harris et al., 2015; Jeunehomme & D'Argembeau, 2015; Uzer et al. (2012) provide valid reflection of strategy use, and assuming that participants typically complied with instructions to respond only when they have a specific memory in mind, most retrieved memories should be specific rather than general and there should be little if any relationship memory specificity and RT. Although reconstruction view is compatible with a relationship between memory specificity and RT, there might be another explanation why longer retrievals are associated with more specific memories. This alternative position presupposes that people monitor the contents of retrieved memories and that they typically engage in deliberate generative search when memories are non-specific. In other words, generation is viewed as a back-up strategy employed when direct retrieval fails to produce a memory or when the initial probe triggers a memory that is not sufficiently specific. Given that additional search is sometimes undertaken to access a more specific memory and that additional search necessarily adds to retrieval time (and usually registers as generative retrieval), any relationship between event specificity, strategy type, and RT would be compatible with the notions that: (a) people can often directly retrieve specific event memories, (b) they generally fall back on a generative strategy when direct retrieval fails to produce a specific memory, and (c) they can correctly determine whether or not the just-completed retrieval process required deliberate memory search.

2. Experiment 1

Experiment 1 had two phases. During Phase 1, participants generated 12 personally-relevant cues. During Phase 2, these cues, and an equal number of generic word cues, were presented to participants, who were required to respond to each with a specific autobiographical memory. RTs and strategy reports were collected on each trial. For reasons outlined above, we predicted that direct retrieval would be common regardless of cue type, but that it would be more common when the cues were personally-relevant than when they were not. We also expected to find that most of the reported memories would refer to specific events rather than general events and that this would be true regardless of cueing condition or reported retrieval strategy.

2.1. Method

2.1.1. Participants

Eighty-three undergraduates from the University of Alberta (59 females, *median age* = 18; 24 males, *median age* = 19) participated to receive course credit. Participants were tested individually in sessions that lasted about 45 min.

2.1.2. Procedure

Throughout the 2-phase sessions, stimulus presentation and data collection were computer controlled. Phase 1 consisted of 12 trials. On each trial, participants saw a phrase that informed them of the type of

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