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RESEARCH REPORT

Selective Memory Retrieval Can Impair and Improve Retrieval of Other Memories

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Research from the past decades has shown that retrieval of a specific memory (e.g., retrieving part of a previous vacation) typically attenuates retrieval of other memories (e.g., memories for other details of the event), causing retrieval-induced forgetting. More recently, however, it has been shown that retrieval can both attenuate and aid recall of other memories (K.-H. T. Bäuml & A. Samenieh, 2010). To identify the circumstances under which retrieval aids recall, the authors examined retrieval dynamics in listwise directed forgetting, context-dependent forgetting, proactive interference, and in the absence of any induced memory impairment. They found beneficial effects of selective retrieval in listwise directed forgetting and context-dependent forgetting but detrimental effects in all the other conditions. Because context-dependent forgetting and listwise directed forgetting arguably reflect impaired context access, the results suggest that memory retrieval aids recall of memories that are subject to impaired context access but attenuates recall in the absence of such circumstances. The findings are consistent with a 2-factor account of memory retrieval and suggest the existence of 2 faces of memory retrieval.

Keywords: retrieval, forgetting, context, inhibition, reinstatement

It has been argued repeatedly in the literature on human memory retrieval that retrieval of some memories (e.g., retrieving part of a previous vacation) can affect retrieval of other memories (e.g., memory for other details of the event). Whereas some researchers have pointed out that such retrieval dynamics may be self-propagating in nature so that retrieval of some memories can aid and guide retrieval of other memories (e.g., Collins & Loftus, 1975; Geiselman, Fisher, MacKinnon, & Holland, 1985), others have argued that retrieval is more like a self-limiting process, and retrieval of some memories attenuates, rather than aids, retrieval of additional information (e.g., Anderson, Bjork, & Bjork, 1994; Roediger, 1974).

Experimental studies from the past decades have generally studied the dynamics of memory retrieval by presenting people a list of items in a learning phase and testing them on it in a subsequent test phase. Retrieval of some target items at test was preceded by retrieval of other list items, to see whether preceding retrieval aids or attenuates retrieval of target items. The general finding in these studies has been that prior retrieval of other list items impairs, rather than improves, retrieval of the target items. The results emerged both when target recall immediately followed retrieval of the other items (e.g., Roediger, 1974; A. D. Smith, 1971), and when there was a longer delay between the two retrieval tasks (e.g., Anderson et al., 1994; Anderson & Spellman, 1995). Since the publication of Anderson et al. (1994), this type of recall impairment has been termed *retrieval-induced forgetting*.

However, retrieval of some memories does not always impair retrieval of other memories. Consistently, Bäuml and Samenieh (2010) recently showed that recall of target memories can also benefit from the prior retrieval of other memories. Employing the listwise directed forgetting task (see R. A. Bjork, 1970), Bäuml and Samenieh let participants study two item lists and, between study of the two lists, provided participants a cue either to forget or to continue remembering the preceding list. Later, memory for predefined target items from the original list was tested. Testing differed in whether participants were asked to recall zero, four, eight, or 12 of the remaining (nontarget) list items before they recalled the target items. Recall of to-be-remembered targets decreased linearly and recall of to-be-forgotten targets increased linearly, as more and more of the nontargets were previously retrieved, indicating that prior retrieval of other memories can impair *and* improve recall of target memories, depending on the memory status of the target information.

Although the study by Bäuml and Samenieh (2010) showed that memory retrieval can be self-propagating, it was silent about the circumstances under which retrieval may show this self-propagating property. Several possibilities arise. For instance, memory retrieval may be beneficial for all types of forgetting, so that the beneficial effect may not be restricted to listwise directed

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forgetting but may show up whenever participants' memory for previously studied information is impaired. Or the beneficial effect of memory retrieval may arise for some forms of forgetting but not for others; for example, it may arise whenever the forgetting includes a certain contextual effect and may not occur for all other forms of forgetting and in the absence of any induced memory impairment.

Indeed, listwise directed forgetting has repeatedly been related to some form of contextual forgetting. It has been argued that the forget cue causes the original (first-)list context to get inhibited by a retrieval inhibition process (e.g., Geiselman, Bjork, & Fishman, 1983) or that the forget cue may induce a change in participants' internal context, which then impairs later recall of the original list due to a mismatch between the context at encoding and the context at retrieval (Sahakyan & Kelley, 2002). Although the two accounts differ in detail, attributing directed forgetting to an inhibitory or noninhibitory mechanism, they both emphasize impaired context access as the source of the forgetting (for alternative accounts, see MacLeod, 1998).

Following such context views on listwise directed forgetting, this study examines retrieval dynamics in forgetting that is due to impaired context access, in forgetting that is not due to impaired context access, and in the absence of any induced memory impairment. To study retrieval dynamics when context access is impaired, we used the listwise directed forgetting task to replicate Bäuml and Samenieh (2010), and we used a variant of Sahakyan and Kelley's (2002) diversion paradigm to study context-dependent forgetting. In this task, participants studied two item lists and, between study of the two lists, counted backward from a three-digit number or performed a mental imagination task. The mental imagination task is assumed to create a change in participants' internal context, which leads to a contextual mismatch between participants' testing context and participants' study context during first-list learning and thus to forgetting of List 1 items (e.g., Pastötter & Bäuml, 2007; Sahakyan & Kelley, 2002).

To study retrieval dynamics in the absence of impaired context access, we employed the proactive interference task. Proactive interference refers to the finding that the preceding study of other lists reduces recall of a subsequently studied critical list, compared with a condition in which no such preceding study occurs (e.g., Underwood, 1957). According to the most widely accepted account, the temporal discrimination theory, the buildup of proactive interference reflects a growing impairment in the ability to distinguish items that appeared on the most recent list from those that appeared on earlier lists; such impairment is supposed to increase the size of the search set at test and thus to reduce recall of the critical list's items (e.g., Baddeley, 1990; Crowder, 1976; Szpunar, McDermott, & Roediger, 2008; Wixted & Rohrer, 1993). In contrast to listwise directed forgetting and context-dependent forgetting, proactive interference thus should not be caused by impaired access to the critical list context.

The results of three experiments are reported, in each of which it is investigated how prior retrieval of a list's nontarget items affects subsequent retrieval of the same list's target items. Experiment 1 employs listwise directed forgetting with the goal to replicate the basic Bäuml and Samenieh (2010) finding; Experiment 2 employs context-dependent forgetting, using Sahakyan and Kelley's (2002) diversion paradigm; Experiment 3 employs proactive interference; and each of the three experiments also includes a (control) condition in which no forgetting was induced. If the beneficial effect of memory retrieval was not restricted to listwise directed forgetting but generalized to all forms of forgetting, then the beneficial effect should emerge in the forgetting condition of each single experiment but should not arise in the single experiments' no-forgetting conditions. Alternatively, if the beneficial effect of memory retrieval was tied to forgetting that results from impaired access to a previous encoding context, then the beneficial effect should emerge in listwise directed forgetting and context-dependent forgetting but should not arise in proactive interference or any of the no-forgetting conditions.

Experiment 1

Using listwise directed forgetting, Bäuml and Samenieh (2010) found that recall of to-be-remembered targets decreased and recall of to-be-forgotten targets increased when nontarget items of the same list were previously retrieved. The goal of Experiment 1 was to replicate this finding. Participants first studied a list of items and then, after study, received a cue either to forget or to continue remembering the list (e.g., R. A. Bjork, 1970; see Figure 1A). After subsequent study of a second list, participants were asked to recall predefined target items from the first list; target items were determined by the experimenter but were unknown to the participant. Target items were either tested immediately or after prior recall of the list's remaining (nontarget) items (see Figure 1D).

Method

Participants. Forty-eight undergraduates participated (*M* age = 22.8 years, range = 20–29 years), all of them speaking German as native language. They took part on a voluntary basis.

Materials. Four study lists (A–D) were constructed, each containing 15 unrelated concrete German nouns (e.g., Bäuml & Samenieh, 2010). List A and List B were designated to be used as List 1, List C and List D were designated to be used as List 2. List A and List B consisted of five target and 10 nontarget items each. Among all items, each target item had a unique initial letter. The remaining items began with a unique word stem.

Design. The experiment had a 2×2 mixed factorial design. Cue (remember vs. forget) was manipulated within participant, and prior nontarget retrieval (absent vs. present) was varied between participants. In the remember condition, List 1 was followed by a cue to remember the list for an upcoming test, whereas in the forget condition, List 1 was followed by a cue to forget the list. Order of conditions, as well as assignment of lists to conditions, was counterbalanced. Retrieval conditions differed in whether participants were asked to retrieve the five target items of List 1 first or after prior recall of the list's 10 nontarget items.

Procedure. Participants completed the two cue conditions successively, with a 10-min break between conditions. List items were exposed individually and in random order for 4 s each. Testing order was controlled through presentation of the items' unique initial letter (targets) or unique word stem (nontargets); the nontarget items were cued with their word stem to increase recall chances for these items and, thus, to boost possible detrimental or incremental effects of prior nontarget recall on target recall. For both item types, the item cues were presented successively and in random order for 6 s each. Responses were given orally. List 2 items were tested subsequently, but the results are not reported.

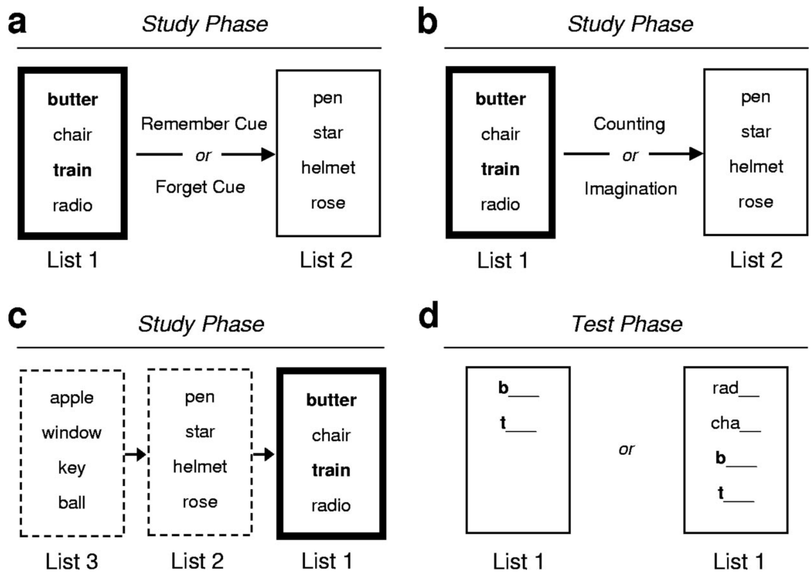

Figure 1. Study and test phase of the three experiments. A. Study phase of Experiment 1: Participants studied two lists of items and, after study of List 1, received a cue either to forget or to continue remembering the list. B. Study phase of Experiment 2: Participants studied two lists of items and, after study of List 1, counted backward from a three-digit number or performed a mental imagination task (e.g., imagining being back in one's childhood home). C. Study phase of Experiment 3: Participants studied a critical final list (List 1), preceded by either zero or two interfering lists (List 2 and List 3). D. Test phase of the three experiments: In all three experiments, participants were asked to recall predefined target items from List 1 (e.g., *butter, train*). The target items were tested immediately or after prior recall of the list's remaining (nontarget) items (e.g., *chair, radio*).

Results and Discussion

Creating directed forgetting was successful, because memory for to-be-forgotten items was worse than memory for to-be-remembered items when target items were tested first, $t(23) = 4.548$, $p < .001$, $d = 0.932$. As is shown in Figure 2A, prior recall of the nontarget items affected to-be-remembered and to-be-forgotten target items differently. Whereas prior nontarget recall *impaired* memory for to-be-remembered targets, $t(46) = 3.741$, $p = .001$, $d = 1.080$, it *improved* memory for to-be-forgotten targets, $t(46) = 2.258$, $p = .029$, $d = 0.652$. Confirming the picture, a 2 × 2 analysis of variance with the within-participant factor of cue (remember vs. forget) and the between-participants factor of prior nontarget retrieval (absent vs. present) showed a

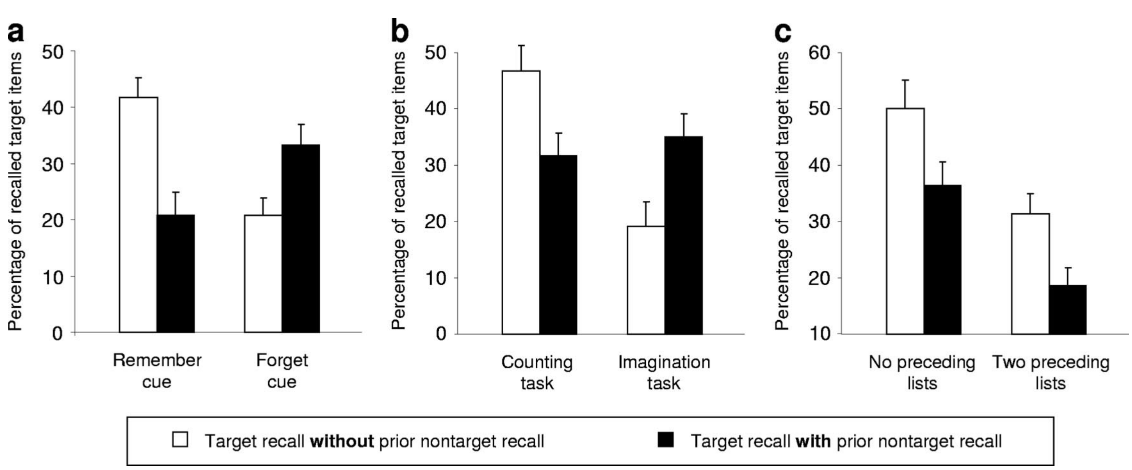

Figure 2. Results of the three experiments. A. Experiment 1: Prior nontarget recall impaired memory for to-be-remembered targets but improved memory for to-be-forgotten targets. B. Experiment 2: Prior nontarget recall impaired memory for targets with the intermittent counting task but improved memory for targets with the intermittent imagination task. C. Experiment 3: Both with and without study of the two preceding lists prior nontarget recall impaired recall of the target items. Error bars represent standard errors.

significant interaction between the two factors, $F(1, 46) = 17.709$, $MSE = 0.038$, $p < .001$, $\eta_p^2 = .278$. There was no main effect of cue, $F(1, 46) = 1.107$, $MSE = 0.038$, $p = .298$, and there was no main effect of prior nontarget retrieval, $F(1, 46) = 1.147$, $MSE = 0.036$, $p = .290$; thus, on average, target recall did not vary with cue condition, and it did not depend on whether the nontarget items were previously retrieved or not. Mean recall rate for the nontarget items did not vary with cue condition (remember = 82.5%, forget = 79.6%), $t(23) < 1$.

The results show that, whether prior nontarget recall induces forgetting or brings related memories back to mind depends on the memory status of the studied material. When operating on to-be-remembered memories, prior retrieval attenuated retrieval of the target items; when operating on to-be-forgotten memories, prior retrieval aided retrieval of the target information. The finding replicates the basic result reported by Bäuml and Samenieh (2010), demonstrating that memory retrieval can both impair and improve recall of other memories.

Experiment 2

In Experiment 2, we induced forgetting by mentally transporting people to another place and time. Individuals studied a first list of items and then, after study, performed a mental imagination task or counted backward from a three-digit number (see Figure 1B). The mental imagination task (i.e., imagining being back in one's childhood home; e.g., Pastötter & Bäuml, 2007; Sahakyan & Kelley, 2002) was similar in content to daydreams, which are known to mentally transport people to another place or time (Delaney, Sahakyan, Kelley, & Zimmerman, 2010); the counting task, on the contrary, is known to induce no such mental context change (Klein, Shiffrin, & Criss, 2007). As in Experiment 1, individuals studied a second list and then were asked to recall predefined target items from the first list. Again, target items were either tested immediately, or after prior recall of the list's remaining (nontarget) items (see Figure 1D).

Method

Participants. Forty-eight undergraduates participated (*M* age = 22.8 years, range = 19–31 years).

Materials. Materials were identical to Experiment 1. Again, List A and List B were designated to be used as List 1, and List C and List D were designated to be used as List 2.

Design and procedure. The experiment had a 2 × 2 mixed factorial design. Task (counting task vs. imagination task) was manipulated within participant, and prior nontarget retrieval (absent vs. present) was varied between participants. In the counting condition, participants counted backward from a three-digit number, whereas in the imagination condition, participants were asked to imagine being back in one's childhood home and to walk through it. In all other respects, Experiment 2 was identical to Experiment 1.

Results and Discussion

Creating context-dependent forgetting was successful, because memory for the target items was worse with the imagination task than with the counting task when the target items were tested first, $t(23) = 6.382$, $p < .001$, $d = 1.322$. Retrieval dynamics differed for the two intermittent tasks (see Figure 2B). With the counting task, prior nontarget recall *impaired* recall of the target items, $t(46) = 2.645$, $p = .011$, $d = 0.764$, whereas with the imagination task, it *improved* recall of the target items, $t(46) = 2.331$, $p = .024$, $d = 0.673$. Consistently, a 2 × 2 analysis of variance with the within-participant factor of task (counting task vs. imagination task), and the between-participants factor of prior nontarget retrieval (absent vs. present) showed a significant interaction between the two factors, $F(1, 46) = 18.489$, $MSE = 0.031$, $p < .001$, $\eta_p^2 = .287$. There was also a main effect of task, $F(1, 46) = 11.358$, $MSE = 0.031$, $p = .002$, $\eta_p^2 = .198$, but there was no main effect of prior nontarget retrieval, $F(1, 46) < 1$. On average, target recall was better after the intermittent counting task than after the intermittent imagination task, but it did not vary with prior retrieval of the nontarget items. Mean recall rate for the nontarget items did not vary with intermittent task (counting = 84.6%, imagination = 84.2%), $t(23) < 1$.

The results show that, whether nontarget retrieval induces forgetting or brings related memories back to mind depends on whether mental context is changed intermittently. When participants' mental context was changed and the original memories were out of context, prior retrieval aided memory for the target items; when participants' mental context was not affected and the original memories were still part of the current context, then prior retrieval attenuated memory for the target items. The finding supports the view that retrieval is self-limiting in some cases but self-propagating in others.

Experiment 3

Experiments 1 and 2 examined retrieval dynamics in two forms of forgetting that arise from impaired access to a previous encoding context. The goal of Experiment 3 was to examine retrieval dynamics in the absence of such impaired context access, to see whether the results of Experiments 1 and 2 generalize to other forms of episodic forgetting. The experiment employed the proactive interference task, in which forgetting is caused by the study of additional material. Participants studied a critical final list, preceded by either zero or two interfering lists (see Figure 1C). At test, participants were asked to recall predefined target items from the critical final list. As in Experiments 1 and 2, target items were either tested immediately, or after prior recall of the list's remaining (nontarget) items (see Figure 1D).

Method

Participants. Fifty-six undergraduates participated (*M* age = 22.8 years, range = 19–30 years).

Materials. Materials were identical to Experiment 1. List A and List B were designated to be used as List 1, whereas List C and List D were designated to be used as Lists 2 and 3.

Design and procedure. The experiment had a 2 × 2 mixed factorial design. Study condition (no preceding lists vs. two preceding lists) was manipulated within participant, and prior nontarget retrieval (absent vs. present) was varied between participants. In all other respects, Experiment 3 was identical to Experiment 1.

Results and Discussion

Creating proactive interference was successful, because memory for the target items was worse in the presence than the absence of preceding lists when the target items were tested first, $t(27) = 2.693$, $p = .012$, $d = 0.514$. As is shown in Figure 2C, prior nontarget recall impaired recall of the target items, both when zero lists preceded the critical list, $t(54) = 2.072$, $p = .043$, $d = 0.554$, and when two lists preceded the critical list, $t(54) = 2.770$, $p = .008$, $d = 0.740$. A 2×2 analysis of variance with the within-participant factor of study condition (no preceding lists vs. two preceding lists) and the between-participants factor of prior nontarget retrieval (absent vs. present) confirmed the picture. It showed significant main effects of study condition, $F(1, 54) = 18.370$, $MSE = 0.051$, $p < .001$, $\eta_p^2 = .254$, and prior nontarget retrieval, $F(1, 54) = 12.325$, $MSE = 0.040$, $p = .001$, $\eta_p^2 = .186$, but no significant interaction between the two factors, $F(1, 54) < 1$. On average, target recall was better in the absence of preceding lists, and it was better when there was no prior retrieval of the nontarget items. As in Experiments 1 and 2, mean recall rate for the nontarget items did not vary with study condition (no preceding lists = 85.4%, two preceding lists = 80.0%), $t(27) = 1.701$, $p = .100$.

The results show that the preceding retrieval of nontarget items attenuates memory for target items, regardless of whether proactive interference was induced before. The finding demonstrates that not all forms of forgetting benefit from the prior retrieval of nontarget items. Rather, together with the results of Experiments 1 and 2, the finding suggests that beneficial effects of memory retrieval may be tied to memories with impaired access to their encoding context.

Further Analyses

In Experiment 1, cue (remember vs. forget) was manipulated within participant; in Experiment 2, task (counting task vs. imagination task) was manipulated within participant; and in Experiment 3, study condition (no preceding lists vs. two preceding lists) was manipulated within participant. Importantly, in none of the three experiments did the reported statistical effects interact with within-participant testing order (all *p*s $> .145$), and there was also no main effect of testing order (all *p*s $> .206$).

General Discussion

The experiments reported here demonstrate that memory retrieval can aid *and* attenuate retrieval of other memories. With regard to memories that were subject to listwise directed forgetting or context-dependent forgetting, prior retrieval of some memories aided retrieval of other memories. With regard to memories that were subject to proactive interference or were not subject to any induced forgetting, prior retrieval attenuated retrieval of other memories. Experimental studies from the past decades have generally found memory retrieval to impair retrieval of other memories (for reviews, see Anderson, 2003; Bäuml, Pastötter, & Hanslmayr, 2010; Roediger & Neely, 1982). By showing that retrieval of some memories attenuates memory retrieval under some circumstances but aids memory retrieval under others, our results suggest the existence of two faces of memory retrieval.

On the basis of research suggesting that listwise directed forgetting reflects impaired context access (e.g., Geiselman et al., 1983), the present results indicate that memory retrieval aids recall of other memories if the memories are subject to this form of contextual forgetting, whereas memory retrieval attenuates recall in the other cases. Indeed, the results showed beneficial effects of memory retrieval when the forgetting was the result of impaired context access (listwise directed forgetting, context-dependent forgetting; e.g., Sahakyan & Kelley, 2002) but showed no such beneficial effects when the forgetting was due to other factors (proactive interference; e.g., Wixted & Rohrer, 1993) and when no forgetting was induced at all (the remember condition, the counting-task condition, the no-preceding-list condition).

In listwise directed forgetting and context-dependent forgetting encoding of the critical (first) list does not vary with cue or task, and the forgetting therefore reflects retrieval failure. In contrast, in proactive interference, the study of prior lists might affect encoding of the critical list, so that the forgetting could be due to impaired retrieval and impaired encoding. Although it cannot be ruled out that impaired encoding contributes to proactive interference in multiple list learning (e.g., Pastötter, Schicker, Niedernhuber, & Bäuml), there is evidence for the critical role of impaired retrieval, as is primarily reflected in the widely accepted temporal discrimination theory of proactive interference (e.g., Wixted & Rohrer, 1993). This retrieval view is supported by the pattern of target and nontarget recall in the present Experiment 3, because forgetting was present with weak retrieval cues (targets) but was absent with strong retrieval cues (nontargets). If proactive interference reflected an effect on the items' encoding, the forgetting should not disappear with better retrieval cues.

The attenuating effects of memory retrieval have often been attributed to inhibitory control mechanisms. During attempts to selectively retrieve a memory, related memories are supposed to interfere and are inhibited to reduce interference and make selection of the targeted information easier (Anderson et al., 1994; Anderson & Spellman, 1995). However, there is evidence that memory retrieval can trigger a second process and item recall can result in partial reinstatement of the context that was present when that item was studied (Howard & Kahana, 1999, Howard & Kahana, 2002). This second process may be responsible for the beneficial effects of memory retrieval in the present study. The process may reactivate the original list context of the retrieved memory, which may lead to reactivation of the list's remaining items and to recall improvement of the target material.

Consistent with this two-factor view of memory retrieval, we found beneficial effects of retrieval when context access was impaired but not in the other experimental conditions. Because impaired context access reduces activation of the original study context and its associated items, much room should be left for context reactivation, whereas not much room should be left for interference and inhibition; as a net result, target recall should improve. In contrast, in the absence of impaired context access, when the original study context and its associated items still show a high level of activation, not much room should be left for context reactivation, whereas interference and inhibition may well arise, causing recall impairment. Thus, inhibition might dominate the effects of memory retrieval in the absence of impaired context access, whereas context reinstatement might dominate the effects in its presence. The present results are consistent with this two-factor view of memory retrieval (for related results and a related account in the context of part-list cuing, see Bäuml & Samenieh, in press).

It has been argued repeatedly that, in listwise directed forgetting, the forget cue causes the original list context to get inhibited by a retrieval inhibition process and that release from this form of inhibition is possible. E. L. Bjork and Bjork (1996), for instance, examined the effects of reexposure of some List 1 items on later recall of List 2 items. The forget cue typically causes forgetting of List 1 items *and* recall improvement of List 2 items (see MacLeod, 1998), but part-list reexposure of List 1 items eliminated the improvement effect. The results were interpreted as evidence that reexposure of some List 1 items can improve access to the remaining list items and thus eliminate the List 2 improvement effect. The results of the present study support and extend this view by indicating that retrieval of some of the items of the inhibited context can release inhibition of the context representation.

Mental travel between study and test can also impair context access, arguably because of a mismatch between the context at encoding and the context at retrieval (e.g., Delaney et al., 2010). Consistent with this view, it has been shown that context reinstatement at test can reduce the forgetting of original list items (Sahakyan & Kelley, 2002). Our results on context-dependent forgetting go beyond the previous results by indicating that retrieval of some of the items of the original context can also reinstate context. In doing so, the present results add to the list of findings reporting parallels between listwise directed forgetting and context-dependent forgetting (e.g., Pastötter & Bäuml, 2007; Sahakyan & Kelley, 2002).

The present results bear similarities to prior work on free and cued recall of categorized lists. For instance, Tulving and Psotka (1971) demonstrated that free recall of a categorized list can be impaired if the study of further material is interpolated, thus showing retroactive interference, but the interference is eliminated if the items' category cues are provided at test. Similarly, S. M. Smith and Moynan (2008) showed that when participants learn target and nontarget lists and the nontarget lists are reprocessed before test, free recall of the target list labels is impaired but cued recall of the items of the target lists is not. These findings mimic the present results if one considers context like a category, suggesting that both reaccess to category and reaccess to context can eliminate an inaccessibility of items. Although this parallel between category and context reaccess captures the basic result in the present and prior work, category and context reaccess may nonetheless differ in detail, because category reaccess appears as a more or less instantaneous process, whereas reinstatement of a previous list context appears as a fairly gradual process that accumulates as more and more of the original items are successfully retrieved (Bäuml & Samenieh, 2010).

Storm, Bjork, and Bjork (2007) recently found that, in listwise directed forgetting, semantic generation of related but not previously presented items reduces later recall of previously studied to-be-remembered items but leaves recall of to-be-forgotten items unaffected. The results for to-be-remembered items parallel those of the present Experiment 1, whereas the results for to-be-forgotten items differ from the present finding of recall improvement. In the Storm et al. study, there was considerable delay between generation and test and extralist items were generated, whereas here target recall followed nontarget recall immediately and a subset of the originally presented items was retrieved. Although both differences may have affected the results, it appears particularly likely that intralist but not extralist recall is needed to reactivate the original list context and thus cause recall improvement (e.g., Howard & Kahana, 2002).

In sum, retrieval of a specific memory attenuates retrieval of some memories but aids retrieval of other memories. The finding is consistent with the view that the effects of selective memory retrieval depend on whether the memories are subject to impaired context access. If the memories are subject to impaired context access, preceding memory retrieval can reactivate the original study context and aid retrieval of the other memories; if context can be accessed, preceding retrieval can inhibit other, interfering memories and thus impair recall performance. The findings are consistent with this two-factor account and suggest the existence of two faces of memory retrieval.

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