Cognition 140 (2015) 40–48

Contents lists available at ScienceDirect

Cognition

journal homepage: www.elsevier.com/locate/COGNIT

Selective memory retrieval in social groups: When silence is golden and when it is not

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ARTICLE INFO

Article history:
Received 16 January 2015
Revised 24 March 2015
Accepted 26 March 2015
Available online 11 April 2015

Keywords:
Episodic memory
Retrieval
Social recall
Forgetting
Context reactivation

ABSTRACT

Previous research has shown that the selective remembering of a speaker and the resulting silences can cause forgetting of related, but unmentioned information by a listener (Cuc, Koppel, & Hirst, 2007). Guided by more recent work that demonstrated both detrimental and beneficial effects of selective memory retrieval in individuals, the present research explored the effects of selective remembering in social groups when access to the encoding context at retrieval was maintained or impaired. In each of three experiments, selective retrieval by the speaker impaired recall of the listener when access to the encoding context was maintained, but it improved recall of the listener when context access was impaired. The results suggest the existence of two faces of selective memory retrieval in social groups, with a detrimental face when the encoding context is still active at retrieval and a beneficial face when it is not. The role of silence in social recall thus seems to be more complex than was indicated in prior work, and mnemonic silences on the part of a speaker can be "golden" for the memories of a listener under some circumstances, but not be "golden" under others.

1. Introduction

Humans as social beings not only experience and encode many things in social groups, but frequently also retrieve specific memories together with others. For instance, two friends who were witnesses to a robbery may meet a few weeks after the crime has happened and talk about the occurrences at that time. When trying to remember details of the robbery, one of the witnesses may then start the recall and selectively recollect some events of the shared past while remaining silent about others. Such silence may arise because what is left unsaid does not fit with current conversational goals (Tversky & Marsh, 2000) or the speaker wants to avoid something stressful that happened to her friend during the crime (Zerubavel, 2006). While the silence thus may be well motivated on the part of the speaker, the question is whether it induces any mnemonic consequences for the listener. In particular, is the information not mentioned by the speaker more likely to be forgotten by the listener than one might expect if the conversation had never taken place at all?

Hirst and colleagues raised and addressed the issue in a recent series of studies (for a review, see Hirst & Echterhoff, 2012). Cuc, Koppel, and Hirst (2007), for instance, let pairs of individuals study a list of items, and later only one member of each pair (the "speaker") selectively retrieved some of the studied items, while the other member of the pair (the "listener") listened and monitored the speakers' recollections for accuracy. When subsequently asking the listener to recall the remaining information, the results showed that the selective retrieval of the speaker impaired the listener's recall of related items, indicating that

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http://dx.doi.org/10.1016/j.cognition.2015.03.009
0010-0277/

remaining silent about parts of a previously experienced episode while retelling the rest of it may not be "golden" and lead to other people's forgetting of unmentioned information (for related results, see Coman, Manier, & Hirst, 2009; Stone, Barnier, Sutton, & Hirst, 2013).

The experiments by Hirst and colleagues were guided by preceding work on retrieval-induced forgetting in individuals, which had shown that the selective retrieval of a subset of previously studied items can impair individuals' later recall of related material (Anderson, Bjork, & Bjork, 1994; Anderson & Spellman, 1995), and generalized these results from individuals to social groups. However, the findings of more recent work suggest that, at least in individuals, selective memory retrieval can be both detrimental and beneficial for recall of other memories, depending on whether access to the original study context at test is (largely) maintained or impaired. In these studies, subjects studied a list of unrelated items. At test, memory for predefined target items of the list was assessed, but this memory test was preceded by retrieval of the list's remaining (nontarget) items. Individuals' access to the study context at test was either left largely unchanged, i.e., the test occurred shortly after study with no major contextual change between study and test, or access to the study context at test was impaired. Such impairment was induced by means of a cue to forget the preceding list (Bäuml & Samenieh, 2010, 2012), an imagination task after study (Bäuml & Samenieh, 2012; Schlichting, Aslan, Holterman, & Bäuml, in press), or a prolonged retention interval between study and test (Bäuml & Dobler, 2015; Bäuml & Schlichting, 2014).[1] The results consistently showed that prior selective retrieval (of the nontarget items) can impair recall of other (target) memories if access to the study context is largely maintained, but that it can improve recall if access to the study context is impaired, thus providing evidence for the existence of two faces of selective memory retrieval.

The goal of the present study was to investigate whether social recall shows the same two faces of selective memory retrieval and initial selective retrieval of one person can both impair and improve recall of another person. The study will thus provide evidence on whether mnemonic silences and selective retellings of the past are generally detrimental for the recall of a listener, or whether mnemonic silences are detrimental under some circumstances but are beneficial under others. Bäuml and Samenieh (2012) followed prior work on retrieval-induced forgetting and attributed the detrimental effect of selective retrieval in individuals to inhibition or blocking, assuming that selective retrieval impairs recall of the other items by weakening the items' memory representation (e.g., Anderson, 2003) or by blocking access to the items (e.g., Roediger & Neely, 1982). In contrast, they attributed the beneficial effect of selective retrieval to context reactivation processes, assuming that when access to the encoding context is impaired, selective retrieval can trigger reactivation of this context and the reactivated context can then serve as retrieval cue for the subsequent recall of the remaining information (e.g., Howard & Kahana, 1999, 2002). Investigating the two faces of memory retrieval in social groups thus may indicate when listening to another person retelling specific details of a shared past induces inhibition or blocking in the listener's recall (causing socially shared retrieval-induced forgetting), and when it may help the listener to reinstate the encoding context (causing socially shared retrieval-induced facilitation).

The results of three experiments are reported designed to examine whether selective retrieval in social groups shows two faces, and retrieval of a speaker can both impair and improve the recall of a listener. The effects of selective retrieval were examined when access to the encoding context was (largely) maintained and when it was impaired. Following prior work on the effects of selective memory retrieval in individuals (e.g., Bäuml & Samenieh, 2012; Bäuml & Schlichting, 2014), we employed three different methods to impair access to the study context at test: an instruction to forget the previously encoded material (Experiment 1), an imagination task to change subjects' mental context after study (Experiment 2), and a prolonged retention interval between study and test (Experiment 3). In each of the three experiments, pairs of individuals learned the very same list of predefined target and nontarget items. At test, the two subjects were then asked to work together when recalling the previously studied list. One of the subjects acted as the speaker and began retrieval, recalling either the target or the nontarget items. The second subject acted as the listener, and recalled the remaining (nontarget or target) items after listening to the speaker's preceding (target or nontarget) recall.

On the basis of the prior work by Hirst and colleagues (e.g., Coman et al., 2009; Cuc et al., 2007; Stone et al., 2013), we expected that the results of each of the three experiments will show the detrimental effect of selective retrieval in social groups – i.e., that the preceding recall of the speaker impairs the recall of the listener – when access to the study context at test was maintained. Going beyond the prior work, we expected that the results of the three experiments will indicate whether this detrimental effect occurs regardless of context condition, or selective memory retrieval shows the same two faces in social recall as in individuals' recall. The results thus will speak directly to the silence hypothesis as put forward by Hirst and colleagues (e.g., Hirst & Echterhoff, 2012), indicating whether, in general, mnemonic silences are not "golden" for the recall of the listener, or mnemonic silences are not "golden" under some circumstances but are "golden" under others.

2. Experiment 1

Experiment 1 applied the list-method directed forgetting task to manipulate subjects' access to the study context. In this task, subjects are presented with two item lists for study. After study of the first list, they receive a cue to forget the list, pretending that it will not be tested

[1] A forget cue has been suggested to inhibit the study context (e.g., Bjork, 1989), an imagination task to induce mental context change (e.g., Sahakyan & Kelley, 2002), and prolonged retention intervals to create external and/or internal context change (e.g., Estes, 1955). In all these cases, impaired context access arises.

later, or they receive a cue to remember the list for an upcoming memory test. Typically, the forget cue impairs access to the study context at test and induces forgetting of the first-list items (Bjork, 1970). The finding is commonly attributed to either an inhibitory process, assuming that the forget cue inhibits access to the first list's study context (e.g., Geiselman, Bjork, & Fishman, 1983), or a non-inhibitory process, assuming that the forget cue induces a change in subjects' mental context and thus, for the first-list items, creates a contextual mismatch between study and test (e.g., Sahakyan & Kelley, 2002). Employing this task, Bäuml and colleagues (Aslan & Bäuml, 2014; Bäuml & Samenieh, 2010, 2012) recently showed that when the items of the first list, unbeknownst to participants, consist of predefined target and nontarget items, then prior recall of the nontargets at test impairs individuals' target recall in the remember condition, but improves individuals' target recall in the forget condition, thus showing two faces of selective memory retrieval. Experiment 1 examines whether the same two faces of selective memory retrieval are present when pairs of subjects recall the items of the first list and target recall of a listener follows preceding nontarget recall of a speaker.

2.1. Method

2.1.1. Participants

128 students enrolled at Regensburg University took part in the experiment ($M = 22.0$ years; range 19–32 years). Participants were evenly distributed across the two target retrieval conditions ($n = 64$/condition) and tested in pairs. In each pair, one participant acted as the speaker, the other participant as the listener.

2.1.2. Material

Two sets of item material were created, each consisting of two item lists. Each list comprised 15 unrelated nouns, taken from different semantic categories (Van Overschelde, Rawson, & Dunlosky, 2004). For each list, 5 items were randomly chosen as target items, and 10 items as nontarget items. Like in the prior work (e.g., Bäuml & Samenieh, 2010), this distinction remained unknown to the participants. Item sets and list sequence within sets were counterbalanced across conditions.

2.1.3. Design

The experiment had a 2×2 mixed-factorial design. The first factor of TARGET RETRIEVAL (first by the speaker, second by the listener) was manipulated between pairs of subjects, and subject pairs were evenly assigned to one of the two conditions. In one condition, the speaker retrieved the target items at the beginning of the test (i.e., before the listener retrieved the nontarget items); in the other condition, the listener retrieved the target items (after listening to the speaker's preceding nontarget recall; see Fig. 1). The second factor of CONTEXT ACCESS (maintained, impaired) was manipulated within subjects. All subjects completed two blocks of the list-method directed forgetting task. In one block, subjects were cued to remember the first of two item lists, which is assumed to keep access to the study context largely maintained; in the other block, they were cued to forget the list, which is assumed to impair access to the study context (Geiselman et al., 1983; Sahakyan & Kelley, 2002). Sequence of cue conditions was counterbalanced across subjects (see also Bäuml & Samenieh, 2010, 2012).

2.1.4. Procedure

2.1.4.1. Study phase. On each of two experimental blocks, subjects consecutively studied two item lists, both comprising 15 items. Items were presented in random order and centrally on a computer screen for 4 s each. Subjects worked alone during encoding. They were not informed about the existence of target and nontarget items, but were simply asked to memorize all presented items as best as they could. Between encoding of a block's two lists, subjects received a cue to either forget or remember the critical first item list. Subjects were either told that the list would not be relevant for the final test and that they should rather focus on the next list, or they were informed that the list would be tested later and they should try to additionally memorize the second list (e.g., Geiselman et al., 1983). After cuing, the second list was presented in the same way as the first list. Before the final memory test began, subjects worked on an unrelated distractor task for 180 s (i.e., rating faces according to their physical attractiveness).

2.1.4.2. Test phase. At test, pairs of subjects worked together, and took turns in recalling the target and nontarget items. In particular, one of the subjects initially acted as the speaker and started the test by retrieving the first few (target or nontarget) items; the items were recalled aloud. Meanwhile, the second subject acted as the listener by paying attention to the first subject's answers and monitoring for accuracy (see Cuc et al., 2007). After (target or nontarget) items were recalled in this way, subjects were asked to swap roles, and the person previously acting as the listener recalled the remaining list items (while the person previously acting as the speaker listened and monitored for accuracy). The test was a cued-recall test, and sequence of target and nontarget items was controlled by providing unique retrieval cues for 8 s each. In the one of the two target retrieval conditions (target retrieval first by the speaker), the subject acting as the speaker was successively and in random order provided with the target items' unique initial letters as retrieval cues, and was asked to complement them with items previously studied in the context of the respective list (target retrieval first by the speaker); subsequently, the subject initially acting as the listener was provided with the nontarget items' unique word stems and was asked to retrieve the remaining items. In the other of the two target retrieval conditions (target retrieval second by the listener), the subject acting as the speaker was successively and in random order provided with the nontarget items' word stems as retrieval cues; subsequently, the subject initially acting as the listener was provided with the target items' initial letters and asked to retrieve the target items. When the first experimental block was completed in this manner, subjects were offered a short break. Afterwards, the second experimental block was conducted in parallel to the first one.

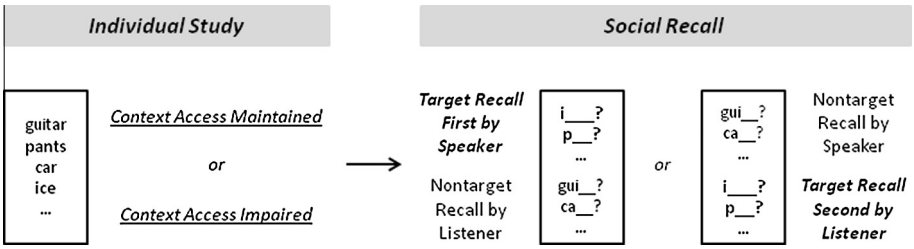

Fig. 1. Illustration of the general experimental procedure applied in Experiments 1–3. During individual study, the two subjects encoded a list consisting of predefined target items (printed in bold) and nontarget items. After study, access to the encoding context was impaired or not. Context impairment was achieved by means of a target cue in Experiment 1, an imagination task in Experiment 2, and a prolonged retention interval in Experiment 3. At test, the two subjects worked together, and it was varied whether the target items or the nontarget items should be retrieved first. One of the subjects always acted as speaker and started recall. The other subject acted as listener and recalled the remaining items. Thus, in the one condition, targets were recalled first by the speaker and nontargets second by the listener; in the other condition, nontargets were recalled first by the speaker and targets second by the listener.

2.2. Results and discussion

Fig. 2a displays mean target recall on the final memory test. A 2 × 2 ANOVA with the factors of CONTEXT ACCESS (maintained [remember cue], impaired [forget cue]) and TARGET RETRIEVAL (first by the speaker, second by the listener) revealed no significant main effects, $Fs(1,62) \leqslant 1.66$, $MSEs \geqslant 227.72$, $ps \geqslant .202$, $\eta^2 \leqslant 0.03$. Yet, a significant interaction between the two factors emerged, $F(1,62) = 30.31$, $MSE = 227.72$, $p < .001$, $\eta^2 = 0.33$, suggesting that target recall in the two context conditions was differently affected by preceding retrieval of the nontarget items. Indeed, preceding nontarget retrieval by the speaker reduced target recall by the listener in the remember condition (35.6% vs. 16.3%), $t(62) = 4.00$, $p < .001$, $d = 1.05$, but facilitated target recall in the forget condition (17.5% vs. 27.5%), $t(62) = 2.25$, $p = .028$, $d = 0.56$. Sequence of cue conditions (remember cue first or forget cue first) did not affect the results, $ps \geqslant .294$. Mean nontarget recall was 86.6% and was unaffected by context access and target retrieval, all $ps \geqslant .09$.[2]

The finding that preceding recall of nontarget items by the speaker reduces recall of to-be-remembered target material by the listener replicates previous work demonstrating socially shared retrieval-induced forgetting (Coman et al., 2009; Cuc et al., 2007; Stone et al., 2013). The finding that a listener's recall of to-be-forgotten target information can be improved by preceding recall of nontarget items by the speaker is new and extends this prior work. Together, the findings indicate that access to the study context can influence whether selective memory retrieval in social groups is detrimental or beneficial. If context access is largely maintained, as was the case in the present remember condition, a detrimental effect of selective retrieval arises; if context access is impaired, as was the case in the present forget condition, a beneficial effect arises. These results point to two faces of selective memory retrieval in social groups.

[2] Nontarget recall was higher than target recall because the items' unique initial letters were used as retrieval cues for targets and the items' word stems were used as retrieval cues for the nontargets, which was done to ensure high recall success for the nontarget items. The presence of these powerful retrieval cues was also the reason why nontarget recall was not much affected by context access and target retrieval.

3. Experiment 2

The aim of Experiments 2 and 3 was to examine whether the pattern of results reported in Experiment 1 is tied to the list-method directed forgetting task or generalizes to other manipulations of context access. Experiment 2 applied the imagination task to manipulate access to study context (e.g., Sahakyan & Kelley, 2002). Here, subjects are presented with two item lists for study. After study of the first list, subjects change their mental context by engaging in an imagination task, or they do not change their context by participating in a simple counting task.

Engagement in the imagination task typically reduces recall of first-list items relative to the counting task, assumedly because, in the imagination condition, the mental context at test no longer matches the mental context during first list study (e.g., Pastötter & Bäuml, 2007; Sahakyan & Kelley, 2002). Applying this paradigm, Bäuml and colleagues (Bäuml & Samenieh, 2012; Schlichting et al., in press) recently showed that when the items of the first list consist of predefined target and nontarget items, then prior recall of the nontargets impairs individuals' target recall in the counting condition, but improves individuals' target recall in the imagination condition. Experiment 2 examines whether the same two faces of selective retrieval are present when pairs of subjects recall the items of the first list and target recall of a listener follows preceding nontarget recall of a speaker.

3.1. Method

3.1.1. Participants

A new sample of 128 Regensburg University students was recruited for the experiment ($M = 22.7$ years; range 18–30 years). Again, subjects participated in groups of two, with one subject acting as the speaker, and the other subject as the listener.

3.1.2. Material

New item material was compiled, parallel to the criteria listed for Experiment 1. From each of the four item lists, 5 items were randomly selected as target items; the remaining 10 items per list served as nontarget items.

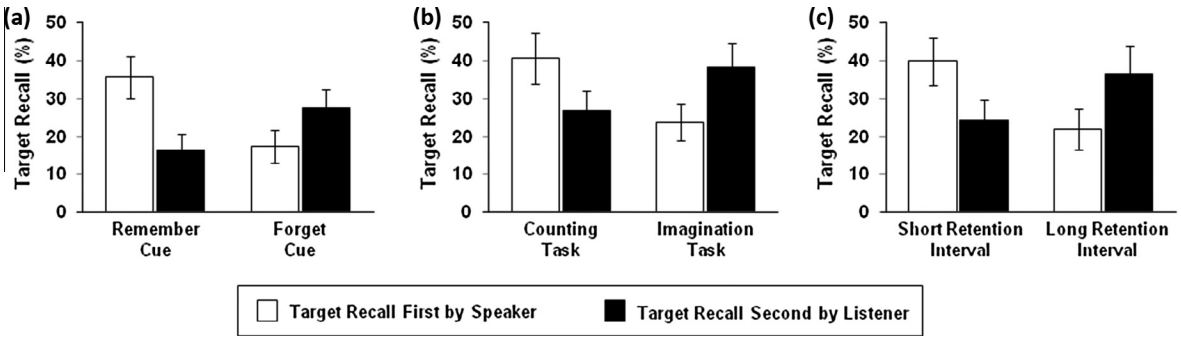

Fig. 2. Mean recall rates for predefined target items are shown as a function of target retrieval (first by the speaker, second by the listener) and context access (maintained, impaired). Error bars represent standard errors. (a) Results of Experiment 1: context access was manipulated by providing a remember cue (maintained context access) or a forget cue (impaired context access) after study of the critical list. (b) Results of Experiment 2: context access was manipulated by asking subjects to engage in simple counting task (maintained context access) or an imagination task (impaired context access) after study of the critical list. (c) Results of Experiment 3: context access was manipulated via variation of the retention interval, employing a short retention interval condition (maintained context access) and a long retention interval condition (impaired context access).

3.1.3. Design

The experiment had the same mixed-factorial design as Experiment 1.

3.1.4. Procedure

The experimental procedure was identical to that of Experiment 1, with the only exception that a context-change manipulation replaced the directed-forgetting manipulation. In the maintained context-access condition, subjects were between study of the two lists asked to count backwards in steps of two for 60 s. This task is assumed to leave subjects' mental context largely unaffected (Klein, Shiffrin, & Criss, 2007). In contrast, in the impaired context-access condition, subjects were asked to engage in an imagination task, to mentally travel back to their childhood home for 60 s and draw a sketch of the house, thereby changing their mental context and making the original encoding context less easily accessible on the later memory test. There were no further differences between Experiments 1 and 2; sequence of context conditions again was counterbalanced across subjects (e.g., Bäuml & Samenieh, 2012).

3.2. Results and discussion

Fig. 2b shows mean target recall. A 2 × 2 ANOVA with the factors of CONTEXT ACCESS (maintained [counting task], impaired [imagination task]) and TARGET RETRIEVAL (first by the speaker, second by the listener) revealed no significant main effects, $Fs(1,62) \leqslant 1.0$, but a significant interaction of the two factors, $F(1,62) = 19.60$, $MSE = 322.88$, $p < .001$, $\eta^2 = 0.24$. Indeed, preceding nontarget retrieval by the speaker reduced recall of the targets by the listener only when no context change had been induced between study and test (40.6% vs. 26.9%), $t(62) = 2.33$, $p = .023$, $d = 0.58$. In contrast, preceding nontarget retrieval by the speaker facilitated target recall by the listener in the mental context-change condition (23.8% vs. 38.1%), $t(62) = 2.54$, $p = .014$, $d = 0.63$. Again, sequence of conditions (imagination task or distractor task first) did not influence the results, all $ps \geqslant .097$. Mean nontarget recall was 76.5% and was unaffected by context access and target retrieval conditions, all $ps \geqslant .250$.

The results of Experiment 2 mimic the results of Experiment 1. Whereas in the counting condition, i.e., when access to the study context was largely maintained, the speaker's preceding nontarget recall reduced the listener's memory for target information, it facilitated the listener's recall in the imagination condition, i.e., when context access was impaired. These findings suggest a critical role of context access for the effects of selective memory retrieval in social groups, indicating the existence of two faces of selective memory retrieval.

4. Experiment 3

While Experiments 1 and 2 impaired access to the study context by means of a forget cue or an imagination task, Experiment 3 impaired context access by means of a prolonged retention interval between study and test, assuming that considerable contextual change occurs during prolonged retention intervals and external as well as internal contextual elements of the study phase can become inaccessible over time (e.g., Estes, 1955; Mensink & Raaijmakers, 1988). Applying this method, Bäuml and colleagues (Bäuml & Dobler, 2015; Bäuml & Schlichting, 2014) recently showed that when subjects study a single list of items consisting of target and nontarget items, then the preceding recall of the nontarget items at test impairs individuals' target recall after a short retention interval of few minutes, but improves individuals' target recall after a prolonged retention interval of two days. Experiment 3 examines whether the same two faces of selective memory retrieval are present when pairs of subjects recall the items of the list and target recall of a listener follows preceding nontarget recall of a speaker.

4.1. Method

4.1.1. Participants

A fresh sample of 128 students took part in the experiment ($M = 22.8$ years; range 18–29 years).

4.1.2. Material

Apart from consisting of only two lists with 15 items each, item material was compiled according to the same criteria as for Experiments 1 and 2. Five items of each list were randomly chosen as target items; the remaining items were used as nontarget items.

4.1.3. Design

The experiment had the same 2×2 mixed-factorial design as the previous experiments.

4.1.4. Procedure

The procedure was largely identical to that of Experiments 1 and 2, the only exceptions being the retention interval manipulation between encoding and test (instead of a directed-forgetting or a context-change manipulation), and the fact that only one item list was studied on each experimental block. In the maintained context-access condition, subjects studied a single list of items, completed an unrelated distractor task for 180 s (i.e., rating faces according to their physical attractiveness), and were then immediately tested on the list. In contrast, in the impaired context-access condition, subjects left the laboratory after study and the distractor task, and returned after a delay of 24 h to be tested on the list. Sequence of blocks was again counterbalanced across subjects.

4.2. Results and discussion

Fig. 2c displays mean target recall. A 2×2 ANOVA with the factors of CONTEXT ACCESS (maintained [short retention interval], impaired [long retention interval]) and TARGET RETRIEVAL (first by the speaker, second by the listener) again revealed no significant main effects, $Fs(1,62) \leqslant 1.0$, but a significant interaction between the two factors, $F(1,62) = 12.21$, $MSE = 565.22$, $p = .001$, $\eta^2 = .17$. Indeed, preceding nontarget retrieval by the speaker reduced target memory of the listener after the short retention interval (39.4% vs. 24.4%), $t(62) = 2.63$, $p = .011$, $d = 0.66$, but facilitated target recall of the listener after the long retention interval (21.9% vs. 36.3%), $t(62) = 2.25$, $p = .028$, $d = 0.56$.

Additional analysis of the influence of sequence of conditions (short retention interval first or long retention interval first) showed a significant interaction between sequence and context access, $F(1,60) = 9.49$, $MSE = 500.63$, $p = .003$, $\eta^2 = .14$, indicating that memory performance in the two retention interval conditions was differently affected by sequence of delays. Target recall after the short retention interval was (numerically) higher when the short retention interval condition was completed first, $t(62) = 1.70$, $p = .093$, $d = 0.43$, whereas target recall after the long retention interval was higher when the long retention interval condition was completed first, $t(62) = 2.25$, $p = .028$, $d = 0.59$. Importantly, there was no three-way interaction between sequence, context access, and target retrieval, $F(1,60) < 1.0$, $p = .480$, indicating that sequence did not alter the general influence of context access on target retrieval. Again, mean nontarget recall (74.1%) was unaffected by context access and target retrieval, all $ps > .06$.

The results of Experiment 3 replicate the pattern of results reported in Experiments 1 and 2. Manipulating the length of the retention interval between study and test, the preceding retrieval of nontarget items by the speaker reduced the subsequent recall of target items by the listener when access to the study context was largely maintained (i.e., after the short retention interval), but it facilitated the listener's target recall when access to the study context was impaired (i.e., after the long retention interval). Like the results of Experiments 1 and 2, these results suggest a critical role of context access in selective memory retrieval and point to the existence of two faces of selective retrieval in social groups.[3]

5. General discussion

Prior work by Cuc et al. (2007) demonstrated that selective memory retrieval from a previously studied list by a speaker can result in forgetting of related, but unmentioned information by a listener. This finding arose under conditions in which the retention interval between encoding and retrieval was short, no major mental context change was induced between study and retrieval, and no forget cue was provided after study of the list. The short retention interval condition of the present Experiment 3 replicates the finding, and the remember cue condition of Experiment 1 and the counting-task condition of Experiment 2 generalize it from single-list learning to two-list paradigms. The results from all these experiments thus converge on the view that selective retrieval in social groups is detrimental if access to the encoding context is largely maintained. Going beyond the prior work, the present experiments also demonstrate a beneficial effect of selective memory retrieval in social groups. The finding arose in the forget cue condition of Experiment 1, the imagination condition of Experiment 2, and the long retention interval condition of Experiment 3. Because in all three conditions access to the encoding context was reduced (e.g., Estes, 1955; Geiselman et al., 1983; Sahakyan & Kelley, 2002), the findings indicate that beneficial effects of selective retrieval in social groups can arise if access to the study context at retrieval is impaired. Together, the two lines of findings point to the existence of two faces of selective retrieval in social groups, indicating that preceding retrieval of some details by a speaker can both impair and improve subsequent recall of other details by a listener.

On the basis of the demonstration of possible detrimental effects of preceding selective retrieval by a speaker on subsequent recall by a listener, Hirst and colleagues suggested that conversational silence – i.e., not mentioning

[3] Some studies on retrieval-induced forgetting in individuals have reported detrimental effects of selective retrieval after prolonged retention interval (e.g., Storm, Bjork, & Bjork, 2012; for a short summary, see Abel & Bäuml, 2012). However, in these studies, selective retrieval typically occurred immediately after study and the delay occurred between selective retrieval and test. Obviously, this contrasts with the present procedure in which selective retrieval took place 24 h after study. Indeed, whether selective retrieval occurs within or out of study context can be critical for the effects of selective memory retrieval (see Bäuml & Samenieh, 2010, 2012).

parts of a retold episode – may not be "golden" and induce forgetting in other people's minds (e.g., Hirst & Echterhoff, 2012). The present results support this view, though only under circumstances in which access to the listener's study context is largely maintained. Going beyond the prior work, the present results provide also a case for socially shared retrieval-induced facilitation, indicating that, when the listener's access to the study context is impaired, mnemonic silence can well be "golden" and improve memory performance. The findings are of relevance for applied settings, like eyewitness testimony. They suggest that, if witnesses to a crime discuss the observed events right after they happened, initial retrieval by a speaker may cause forgetting of the unmentioned information by the listener. However, if the witnesses discuss the incidents a few weeks after the crime, initial retrieval by the speaker may bring the still unmentioned details back into the listeners' minds. The role of silence in eyewitness memory and, more generally, in social recall thus seems to be more complex than was indicated in previous work, and mnemonic silences may impair recall in some situations but improve recall in others.

The present findings are consistent with a two-factor account of the effects of selective retrieval in social groups. This account assumes that selective retrieval by a speaker can induce both inhibition or blocking and context reactivation in the listener's memory. Which of the two types of processes dominates in a situation may depend on the extent to which the listener's access to the encoding context at retrieval is impaired. If context access is (largely) maintained, interference between the encoded memories may be high, leaving much room for inhibition and blocking; because not much room should be left for context reactivation processes, detrimental effects of selective retrieval in the listener's recall may arise. In contrast, if the listener's access to the encoding context is impaired, not much room should be left for inhibition and blocking, but much room may be left for context reactivation, inducing beneficial effects of selective retrieval of the speaker in the listener's recall. This two-factor account can explain the results of the present experiments, and generalizes the results on the two faces of selective retrieval in individuals to social groups (see also Bäuml & Dobler, 2015; Bäuml & Samenieh, 2012).

At first glance, the present finding of socially shared retrieval-induced facilitation after a retention interval of one day – and, more generally, after impaired context access – seems to be in conflict with the results of prior work, which demonstrated socially shared retrieval-induced forgetting for autobiographical memories (Stone et al., 2013) and flashbulb memories (Coman et al., 2009), memories that had all been encoded long time before the studies' recall tests started. However, in contrast to the present study, in both previous studies, the target memories were reactivated before selective retrieval was initiated. In the one study, a questionnaire probed participants' memories of the September 11 attack before selective retrieval of the memories started; in the other study, participants took part in an elicitation phase during which they generated the autobiographical memories, and one day later were provided with each generated memory immediately before selective retrieval began. Crucially, such reactivations may have improved access to the encoding context and retrieval may thus have triggered inhibition or blocking rather than (further) context reactivation. To test this proposal, future work may repeat the two previous studies varying the time interval between reactivation and selective retrieval. The results of such work may demonstrate that, depending on the length of the interval, selective memory retrieval can both impair and improve autobiographical as well as flashbulb memories.

As Cuc et al. (2007) pointed out, socially shared retrieval-induced forgetting is not automatic, but is under the (intentional or unintentional) control of the listener, and depends on whether the listener retrieves information concurrently with the speaker. Consistently, these authors found the forgetting to be present when the listener monitored the speaker's recollections for accuracy, but found the forgetting to be absent when the listener was asked to attend to superficial features of the speaker's recollections, like the speaker's fluidity (see also Coman, Stone, Castano, & Hirst, 2014; Koppel, Wohl, Meksin, & Hirst, 2014). However, it is unclear whether socially-shared retrieval-induced facilitation also depends on whether the listener retrieves information concurrently with the speaker. Using both the list-method directed forgetting task and a prolonged retention interval, Bäuml and Dobler (2015) showed that while the detrimental effect of selective retrieval in individuals is retrieval specific and does not arise after selective restudy trials, the beneficial effect occurs both after selective retrieval and selective restudy trials. This finding indicates that, in social groups, the beneficial effect of selective retrieval by the speaker may arise both when the listener monitors the speaker's recollections for accuracy (repetition with concurrent retrieval) and when the listener monitors the speaker's fluidity (repetition without concurrent retrieval), suggesting a possible dissociation between socially-shared retrieval-induced forgetting and socially-shared retrieval-induced facilitation (for a more general discussion of parallels and differences between individual and group recall, see Weldon & Bellinger, 1997).

According to Hirst and colleagues, socially shared retrieval-induced forgetting can occur when listeners (or any recipients of a communication) concurrently retrieve along with the speaker. In such instances, listeners are supposed to selectively retrieve in just the same manner as the speaker. Hence, when selective retrieval produces impaired recall of unmentioned memories in a speaker, it should produce similar impairment in listeners. This proposal assumes that socially shared retrieval-induced forgetting should not be present if (i) the listener does not concurrently retrieve, and (ii) selective retrieval will not produce the expected mnemonic impairment. The finding by Hirst and colleagues that concurrent retrieval takes effort and, as a result, listeners only undertake it in specific circumstances, is consistent with the first part of this proposal (Coman et al., 2014; Cuc et al., 2007; Koppel et al., 2014). The present results are consistent with the second part, showing that socially shared retrieval-induced forgetting can be absent if selective retrieval – on the part of

either a speaker or a listener – is not conducive for retrieval-induced forgetting effects, for instance, because access to the study context is impaired. Future work may strengthen this second part even further by showing that socially shared retrieval-induced forgetting is generally absent when selective retrieval does not induce the expected mnemonic impairment (e.g., Bäuml & Kuhbandner, 2007; Chan, McDermott, & Roediger, 2006; Koessler, Engler, Riether, & Kissler, 2009).

Following prior work on the two faces of selective memory retrieval (e.g., Bäuml & Samenieh, 2010) and prior work on list-method directed forgetting (e.g., Bjork, 1970) and mental context change (e.g., Sahakyan & Kelley, 2002), we employed unrelated words as study material in the present experiments. This feature contrasts with many previous studies on retrieval-induced forgetting, in which often semantically categorized lists were employed as study material (e.g., Anderson et al., 1994). The question arises of whether the present results generalize from lists of unrelated items to categorized item lists. There is already evidence that the detrimental effect of selective retrieval can arise regardless of list composition. Employing categorized lists, Cuc et al. (2007) in fact showed that selective retrieval of some items of some categories by a speaker can impair recall of the practiced categories' other items by the listener, relative to the recall of control items from the unpracticed categories, which mimics the detrimental effect of selective retrieval with lists of unrelated items in the present study.[4] If the present beneficial effects also generalized from lists of unrelated items to categorized lists, the interesting question would be whether selective retrieval of some items of some categories by the speaker specifically improved recall of the practiced categories' other items by the listener, or alternatively improved recall of the items from both practiced and unpracticed categories. It is a high priority for future work on the beneficial effects of selective memory retrieval to address this important issue.

The present evidence for two faces of selective memory retrieval in social groups emerged very consistently across the three experiments and the different manipulations of context access. In all these experiments, the social groups consisted of two subjects – the speaker and the listener – , retrieval by both the speaker and the listener was carefully controlled, and unrelated items were used as study material. While such rigorous experimental control appears reasonable when investigating an issue in the first step, in the next step it may be examined whether the present findings generalize to a broader range of conditions. There is already evidence that the detrimental effect of selective memory retrieval generalizes to a broader range of conditions. Cuc et al. (2007), for instance, showed detrimental effects of memory retrieval in social groups not only by application of the carefully controlled speaker–listener task but also in free-flowing conversations. Coman et al. (2009) reported socially-shared retrieval-induced forgetting for flashbulb memories and Stone et al. (2013) for emotional and unemotional autobiographical memories. Rajaram and Pereira-Pasarin (2010) reviewed evidence that detrimental effects of joint recall are not restricted to pairs of subjects but may also emerge in larger social groups than just dyads. On the basis of all this evidence for a broader validity of the detrimental effect of selective memory retrieval, one may expect that the beneficial effect of selective retrieval generalizes to a broader range of conditions as well, although future research is needed to examine the issue in more detail.

[4] In categorized lists, inhibition or blocking is assumed to arise mostly because of interference between semantically related items. In lists with unrelated items, interference between items is supposed to arise because list items share a common temporal context cue, which can be sufficient to induce inhibition or blocking (e.g., Raaijmakers & Shiffrin, 1981).

6. Conclusions

The memorial consequences of listening to another person's selective retelling of a common past can depend on context. The listening to another person's selective retelling can be detrimental for recall when the listener's access to the encoding context is maintained but can be beneficial when the listener's access to the encoding context is impaired. The resulting evidence for two faces of selective memory retrieval in social groups suggests that mnemonic silences on the part of a speaker may be "golden" for the memories of a listener under some circumstances, but may not be "golden" under others.

Acknowledgments

We thank L. Ackermann, C. Bauer, V. Haller, R. Kleinsteuber, C. Nottberg, L. Wallner, and R. Zack for their help with data collection.

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