Remembering in Conversations: The Social Sharing and Reshaping of Memories

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Keywords

communication, collaborative facilitation/inhibition, social contagion, retrieval effects, retrieval-induced forgetting, shared reality, social network

Abstract

People constantly talk about past experiences. Burgeoning psychological research has examined the role of communication in remembering by placing rememberers in conversational settings. In reviewing this work, we first discuss the benefits of collaborative remembering (transactive memory and collaborative facilitation) and its costs (collaborative inhibition, information sampling biases, and audience tuning). We next examine how conversational remembering affects subsequent memory. Here, we address influences on listeners' memory through social contagion, resistance to such influences, and then retrieval/reexposure effects on either speaker or listener, with a focus on retrieval-induced forgetting. Extending the perspective beyond single interactions, we consider work that has explored how the above effects can spread across networks of several individuals. We also explore how a speaker's motive to form a shared reality with listeners can moderate conversational effects on memory. Finally, we discuss how these various conversational effects may promote the formation of collective memories.

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INTRODUCTION

Human memory can serve a variety of functions (see, for instance, Bluck 2003), but what might be unique to humans is that their remembering has a communicative function (Pillemer 1992). One diary study revealed that 62% of the events recorded by participants had already been told to others by the evening of the day that they occurred (Pasupathi et al. 2009). Another study tracked conversational exchanges about a class field trip to a morgue. Although the original class contained only 33 students, after three exchanges, 881 people knew of the visit to the morgue, a propagation rate of 26.7 (Harber & Cohen 2005). And in a survey conducted by Skagerberg & Wright (2008b), 58% of the interviewed eyewitnesses reported having discussed the witnessed incident with at least

one cowitness. This pervasive exchange of memories may be becoming both broader and quicker as social media supplies yet other means of communicating about the past. Whatever the format, the constant chatter can be about jointly experienced events, individually experienced events, or facts. That is, people share with each other both their episodic and semantic memories.

We are interested here in exploring acts of remembering when they serve a communicative function. We focus here exclusively on communicative remembering in nonelderly adults. An examination of the developmental literature and work on the elderly is beyond the scope of this review. We are particularly interested in remembering within a conversation. People converse with others about the past or about previously learned information for a variety of reasons: to inform others, to seek desired information, to create a sense of intimacy, or to influence others (for a taxonomy of communication goals, see McCann & Higgins 1988). Even when remembering alone, there may still be a virtual audience, consistent with the notion of the looking-glass self (Mead 1934).

Our interest here is not in the reasons for conversing about the past, but rather in the consequences of conversational remembering for memory. To study these consequences, experimenters need to place rememberers in conversational settings. The past few years have seen a break from traditional approaches to the experimental study of memory, which rarely investigate conversational remembering per se. We review this recently burgeoning experimental psychological literature here. We consider two sets of questions (cf. Pasupathi 2001). The first focuses on the memories emerging within a conversation. How does individual remembering differ from conversational remembering? Is remembering in a conversation more effective than remembering in isolation? And do answers to these questions depend on the circumstances of the conversation and the participants in the conversation?

The second set of questions focuses on memories held after the conversation. This

set of questions is further subdivided by distinguishing the person doing the remembering in the preceding conversation—the speaker—from the person listening to the remembering—the listener. Conversational participants will probably adopt both roles within a conversation, but at any point in the conversation, one can usually identify a single speaker and one or more listeners. Researchers have summed instances in a conversation in which a participant assumes the role of speaker, and summed instances in which the same participant assumes the role of listener. In this way, they have studied the effects of conversational remembering on speakers and listeners. The second set of questions, then, is divided into concerns about (a) the effect of what a participant says while in the role of a speaker on her own memory and (b) the effect of what she says on listeners' subsequent memory. Before addressing these two sets of questions, we situate the study of conversation and memory within a larger theoretical framework.

Conversational Remembering and the Extended Mind

Research that focuses on not just what happens in the head while remembering, but also what occurs within and after a conversation, could be viewed as treating the mind as extended. A number of scholars have observed that cognition is often scaffolded by external resources, such as media, cultural institutions, or social networks (Clark 2010, Hutchins 1995, Sutton et al. 2011, Wilson 2005). In the case of conversational remembering, the conversation could be treated as a scaffold. One person in the conversation, for instance, might remind another of an initially forgotten memory. In this way, the performance of any individual conversational participant depends critically on others (see Hirst & Echterhoff 2008, Wegner 1987). Those espousing an extended mind aver that external influences, in our case, conversations, and internal processing can become so intertwined as to make it difficult, if not impossible, to separate the two. For proponents of an extended mind,

scaffolds are as much a part of the mind as what happens inside the head.

Bateson (1979) illustrates this point with his example of a blind man navigating through the world with a cane. To explain the blind man's navigation, researchers might investigate the cortical activity accompanying the navigation and treat any input from the outside world in terms of cortical input. Many researchers might also want to go beyond an exclusive focus on cortical activity and include in their explanations the origins of cortical inputs, for instance, the activation occurring on the nerve endings of the fingers holding the cane. The configuration of these nerve endings might be important, inasmuch as different configurations might be the source of different patterns of cortical input. A proponent of an extended mind would ask: Why not go beyond the surface of the skin and include the cane? Unquestionably, the nature of the cane—for instance, its rigidity—is as much a factor in the blind man's ease of navigation as the configuration of nerve endings or the processing in the cortex. There is no a priori reason to exclude the cane from explanations. For proponents of an extended mind, the most principled approach would include the cortex, the fingertips, and the cane.

In a similar way, those postulating an extended mind would want to include in their explanation of remembering the external resources scaffolding the remembering, including the conversations in which the remembering takes place (Wilson & Clark 2009). Although one can, in some instances, distinguish between the retrieval of a memory and its conversion into an expression of this memory, often in the form of some type of verbal communication (Tulving 1983), proponents of an extended mind would insist that, in many cases, it is impossible to separate the memory from its expression (Barnier et al. 2008, Echterhoff & Hirst 2002). As we will see in this review, what is remembered often depends on both the audience and conversational dynamics. For example, a conversation of Jane with her mother about her date last night might differ in content from her conversation with her girlfriend

about the same date. In a conversation with her mother, Jane may sometimes intentionally censor what she says, but in many instances, she may simply talk to her mother in a free-flowing manner, without any sense of censoring herself. The nuances of the ending of the date may simply not come to mind in her conversation with her mother because that is not what her mother is interested in or asks her about. On the other hand, details about the end of the date may figure centrally in Jane's conversation with her girlfriend. These details may be what the girlfriend is interested in, what she asks Jane about, and what Jane remembers. In her conversational remembering, Jane is simply tuning her remembering to her audience.

How do we separate the communicative demands of the situation from what is—or is not—remembered? One does not have to accept that the mind is extended to find it difficult to make this separation. Remembering often occurs within a conversation, and one can be interested in the psychology underlying this phenomenon whether or not one embraces the notion of an extended mind. The extended mind approach, however, places the study of conversational remembering front and center in a way more traditional approaches to the study of memory do not.

REMEMBERING IN A CONVERSATION: HOW DOES THE ACT OF CONVERSING SHAPE REMEMBERING?

In many instances, people may experience the same event and then come together to talk about it, as college alumni do at a college reunion or as couples do after returning home from a dinner party. In both instances, the remembering is often collaborative. The group or couple views their task as helping each other to remember the past. Does this collaborative effort at remembering differ from individual acts of remembering? Does the group remember more or less than individuals? How does the way individuals remember in a group differ from how they might remember in isolation?

There is now a burgeoning literature addressing such questions. In some cases, the experiments focus on quantity of recall; in others, quality or accuracy (Koriat et al. 2000). What we want to stress here is that, in any event, researchers have identified both benefits and costs to collaborative remembering.

Benefits of Collaborative Remembering

Transactive memory. When several people come together as a team or group to work on a task, they can, under the right circumstances, perform better than they could as individuals (Kerr & Tindale 2004). Research on transactive memory suggests that this general finding also holds true for memory tasks (for a review, see Hollingshead & Brandon 2003). According to the theory of transactive memory, people can divide a memory task among themselves so as to make it easy for them to fill in gaps in each other's recall. In this way, they distribute the burden of remembering, using one another as external memory aids. Wegner (1987) referred to this division of responsibilities as a transactive memory system.

In transactive memory studies, participants complete a memory task, typically the recall of information in specific knowledge domains (e.g., history or science). Participants first estimate the other person's and their own expertise. Subsequently, both members of a dyad study relevant material and then recall the learned information jointly with each other. The benefit of transactive memory has been demonstrated for close relationships, work teams, and professional relationships (see Hollingshead & Brandon 2003).

To achieve effective transactive memory, group members need a sufficient amount of knowledge, or correct intuitions, about what each other can remember. For instance, dating couples, who presumably have exquisite knowledge about each other, exhibit better memory than do pairs of unacquainted individuals (Hollingshead 1998a). However, even unacquainted dyads can benefit from collaborative

efforts. When unacquainted pairs and dating couples were given the opportunity to communicate during the study phase of an experiment, the unacquainted couples subsequently jointly recalled the studied material better than the dating couples (Hollingshead 1998b). The poor performance of the dating couples may have arisen because their conversations during encoding might have interfered with the operation of an evolved transactive memory system.

Collaborative facilitation. Even when unrelated individuals collaboratively remember previously individually studied material, benefits can be observed. In a typical experiment on collaborative remembering, participants study material (the study phase) and then recall the material as a group or individually (respectively, the experimental or control phase). In some instances, a memory test is inserted between the study phase and the experimental/control phase. In yet other instances, a final memory test follows the experimental/control phase. Distracter tasks are usually placed between the different phases of the study. In most studies, during the experimental phase, participants are asked to remember, as a group, what they had previously studied.

Using this paradigm, experimenters have repeatedly shown that the group, as a unit, recalls more than at least some of the individual members of the group might recall alone (Weldon 2001). This collaborative facilitation arises in part because not all the original material is equally memorable across participants, and hence, some of the participants may contribute to the group recounting something that would not appear in other members' individual recall. Interestingly, one might also expect the facilitation to occur because a recollection offered by one participant in the group recounting cues new memories from another person, memories that might not otherwise be remembered. Surprisingly, such cross-cueing is rarely observed (e.g., Meudell et al. 1995). Experimenters, however, may have failed to uncover evidence for cross-cueing because it is masked by disruptions occurring while participants

collaboratively remember rather than because it does not occur (Congleton & Rajaram 2010). Whatever the extent of cross-cueing, it is clearly the case that groups, as a unit, remember more than individuals might when recalling alone.

Costs of Collaborative Remembering

Just because a group may remember more than an individual would remember in isolation, the group does not necessarily remember all that individual recalls would suggest the group is capable of remembering. That is, group recounting is not the sum of the individual capacities of the group members. We discuss below several ways collaborative remembering comes with a cost, specifically collaborative inhibition, information sampling biases, and audience tuning.

Collaborative inhibition. These experiments contrast group recall scores with nominal recall scores. A nominal recall score is calculated by examining individual recall performance, for instance, in the control phase. An experimenter might test two individuals, one of whom remembers in isolation items A, B, D, and F from the original study material and the second of whom remembers in isolation items B, C, and F. The nominal recall score would be 5, inasmuch as five distinct items are recalled across these two individuals. This nominal score is contrasted with performance when two individuals remember collaboratively. For instance, they might jointly remember items B, D, and F in a group recounting. The group recall score, then, would be 3. In this example, as is the case in much of the experimental literature, the group recall score is less than the nominal recall score (for a review, see Rajaram & Pereira-Pasarin 2010). The collaboration seemingly inhibits some memories from emerging into the group recounting, thereby leading the group to recount less than one would expect by summing the unique memories recalled by individual group members when remembering in isolation.

Collaborative inhibition could be attributed to social loafing or "free-riding" (see Rajaram

Collaborative inhibition: reduced recall performance of groups compared to the sum of individual performances (group recall score < nominal recall score)

Audience tuning: goal-dependent adaptation of a message to the audience's assumed characteristics (typically inner states such as knowledge, expectations, attitudes)

& Pereira-Pasarin 2010). However, when personal accountability and motivation are manipulated to control for social loafing, collaborative inhibition still remains robust (Weldon et al. 2000). According to the retrieval disruption hypothesis, collaborative inhibition occurs, at least in part, because one group member's pursuit of an effective retrieval strategy disrupts the use of retrieval strategies that may be more effective for other group members (Basden et al. 1997). As a result, some group members may not be able to undertake their most effective retrieval strategy. In such an instance, they may recall less during the group recounting than they would if recalling by themselves. The group recall score will fall below the nominal recall score.

Tests of retrieval disruption often contrast conditions in which the organizational representation of the to-be-remembered material is more or less likely to be shared across group members. The more organizational representations differ across participants, the more likely it is that different retrieval strategies will be effective for different participants. With different organizational representations across group members, then, collaborative inhibition should appear. On the other hand, with similar organizational representations across group members, collaborative inhibition should be diminished or disappear. Thus, Findlay and colleagues (2000) found that when they ensured that the organizational structure was similar across group members, collaborative inhibition disappeared. As to the presence of different organizational representations, one experiment examined groups recounting 90 previously studied items (Basden et al. 1997). In the large-sized categories condition, the 90 items consisted of 15 exemplars from six categories; in the small-sized category condition, the list contained six exemplars from 15 categories. Participants were more likely to have variable organizational representations with large-sized categories (here, defined as the extent to which the exemplars are neatly organized into categories). That is, different participants may have assigned an exemplar to different categories when the categories are large. As organizational variability increased, so did collaborative inhibition.

Following the same logic, Basden et al. (1997) predicted and found that, again for lists of categorizable words, collaborative inhibition disappeared when the experimenter forced participants to recall one category at a time during the group recounting rather than allowed the participants to follow their own devices. The latter procedure is likely to produce more variable organization and hence greater collaborative inhibition. Together, these studies provide strong support for the retrieval disruption hypothesis.

The findings of inhibition with collaborative remembering are similar to those found in part-list cueing studies, which focus entirely on individual recall (Basden & Basden 1995). Generally, cueing aids memory. In part-list cueing studies, participants study a list of words and then receive as a cue a subset of the studied items. Rather than enhancing memory performance, the part-list cue significantly lowers it. The most widely accepted explanation for the part-list cueing effect involves retrieval disruption. The partial list may not contain optimal cues, inasmuch as they may not link effectively with the organizational representation participants formed of the list as they studied it. As a result, the partial list may elicit from participants ineffective rather than effective retrieval strategies. The similarity of explanations for collaborative inhibition and the part-list cueing effect is not coincidental. The material that one member of a group recalls while collaboratively remembering may be viewed as a partial list, suggesting that the inhibition in the collaborative remembering experiments and in the part-list cueing experiments arises for similar reasons.

Collaborative inhibition can be found for a wide range of material: related and unrelated words, word pairs, stories, semantic and episodic memory tasks, pictures, short film clips, and emotionally charged events (see Rajaram & Pereira-Pasarin 2010). Moreover, it varies with group size (Basden et al. 2000). Members of large groups are more likely to

have diverse mnemonic representations than are members of small groups. Consequently, according to the retrieval disruption account, large groups should, and do, exhibit greater levels of collaborative inhibition than do small groups. Similar reasoning would also suggest that collaborative inhibition should be greater in groups of unrelated individuals than in groups of familiars, in that familiars should be more likely to form similar representations of the past than would strangers. Studies of dyads of friends and married couples have routinely failed to find collaborative inhibition (e.g., Andersson 2001). However, collaborative inhibition is not inevitable when strangers collaboratively remember. Meade and colleagues (2009) contrasted collaborative remembering of scenarios involving the navigation of planes. Nonexpert pilots exhibit the standard collaborative inhibition, whereas expert pilots recalling with other expert pilots produce a group recall score greater than the nominal score. Presumably, the expert pilots shared the same organization and knowledge about flying. The similarity led to a cross-participant efficient use of retrieval strategies.

These findings would suggest that the way people study the to-be-remembered material, what Congleton & Rajaram (2011) called the study history, should affect the size of the collaborative inhibition, in that study history should affect the similarity and strength of mnemonic organization across participants. For instance, Pereira-Pasarin & Rajaram (2011) exposed participants to lists of target words either once or repeatedly in a spaced format. They then asked groups of three to recall the words jointly, thereby presumably inducing them to achieve a solidified organized representation. Repeated presentation during study not only improved overall recall, but also substantially attenuated the level of collaborative inhibition. In a related study, Congleton & Rajaram (2011) contrasted the effects of different learning histories, e.g., study-study-study or study-recall-recall, either of which occurred prior to collaborative remembering. Employing these two "histories" allowed Congleton & Rajaram

to contrast the contribution of study and test to the final recounting. As they predicted, the repeated testing was more likely to solidify a retrieval strategy than was repeated study and, as a result, repeated testing, but not repeated study, decreased collaborative inhibition.

Other support for the retrieval disruption hypothesis can be found by imposing a secondary task on participants as they study. Divided attention tasks during study have been shown to diminish the level of mnemonic organization, as evidenced in a subsequent individual recall test. As the retrieval disruption hypothesis would predict, the same divided attention study task produces greater collaborative inhibition in a group recall task (Rajaram & Pereira-Pasarin 2010). In a similar vein, Takahashi & Saito (2004) showed that the less idiosyncratic the retrieval strategies employed by members of a group, the smaller the collaborative inhibition.

Taken together, the retrieval disruption account has strong predictive value and can explain the presence and absence of collaborative inhibition in a wide range of settings.

Information sampling biases. Retrieval disruption may not be the only reason why participants in a group recounting fail to remember all they are capable of remembering. In a series of experiments, Stasser, Wittenbaum, and their colleagues taught participants about a political candidate and then assembled small groups to discuss with each other what they knew about the candidate. The original material was constructed in such a way that, whereas all participants in the group knew certain facts about the candidate, each participant also knew several unique facts, that is, facts that only he or she knew. Stasser, Wittenbaum, and colleagues repeatedly found that participants in the group recounting were more likely to recall their shared information than their uniquely held information (for a review, see Wittenbaum & Park 2001). The failure to mention the unshared information was attributed to a fairly straightforward sampling bias (Stasser & Titus 1987). Specifically, a group will fail to discuss

an item only if all members fail to mention it. As a result, when memories are shared, there is a greater probability that they will be mentioned by at least one group member than when they are uniquely held (see Wittenbaum et al. 2004 for a review of alternative explanations).

A number of studies have examined the condition under which unshared memories are more likely to emerge in a group recounting. Although we cannot offer here a complete review of this substantial literature (again, see Wittenbaum et al. 2004), we can offer a general observation: Early work tended to examine what might be viewed as structural features of the conversational interactions, e.g., finding that information is more likely to be discussed as the number of group members who know it increases (Cruz et al. 1997). More recent work has focused on motivational factors (see Wittenbaum et al. 2004).

Audience tuning. Another way to understand why less is remembered in a group recounting than might be remembered by each participant alone is to focus on the way each member of the group takes into account her audience. Marsh (2007) has distinguished recalling from retelling. In a standard, laboratory-based recall experiment, participants are explicitly told to remember all that they can remember as accurately as possible. Marsh reserved the term "recall" for just such an activity. In everyday life, however, people may simply wish to retell a story about the past without trying to be either accurate or complete. This retelling can be shaped by the goals of the retelling. For instance, what will be recounted will differ substantially if the goal of the conversation is to explain the facts than if the goal is simply to entertain. Dudukovic and colleagues (2004) found that entertaining retellings contained fewer story events, less sensory references, and more intrusions than did factual retellings. Moreover, in comparison with factual retellings, the entertaining stories were less accurate, were more likely to be told in the present tense, and contained more emotion words and fewer disfluencies (e.g., uh's).

While retelling, speakers will also tune their recollections to what they believe the audience expects to hear. For instance, Pasupathi et al. (1998) found that speakers conveyed more, particularly more novel and more elaborated, information to an attentive as opposed to a distracted listener. Another experiment uncovered that people will recount more details, such as everything involved in a trip to the doctors, when talking to a hypothetical Martian, who presumably knows little about how things work on Earth, than when talking to a peer, who presumably knows a lot more (Vandierendonck & Van Damme 1988). Yet another experiment showed that a story told to peers contains more interpretations about the content of the story than if told to an experimenter, when participants largely stuck to the "facts" (Hyman 1994). There is also experimental work establishing that when helping a listener identify a specific person among a group of individuals, speakers will emphasize the target's positive qualities if they know the listener likes the target, and the target's negative qualities if they know the listener dislikes the target (Echterhoff et al. 2009a). In general, retellings conform to conversational maxims, such as "say no more than is necessary" (Grice 1975) or "be relevant" (Sperber & Wilson 1986). Considered together, the extant research establishes that a retelling almost always contains less than might emerge in a test of recall, with audience tuning, conversational goals, retrieval disruption, and sampling biases contributing in their own ways to a less-than-optimal performance.

THE EFFECT OF CONVERSATIONAL REMEMBERING ON SUBSEQUENT MEMORY

The thrust of the extant work on collaborative remembering is that remembering is selective. The research specifies what kinds of social interactional factors shape what people will or will not remember, but repeatedly it establishes that, in ordinary conversations, people do not remember all that they are capable of remembering. We are interested in this section

on the consequences of this selectivity on subsequent memory. What people remember is almost always a product not just of the original encoding of an event, but also the conversations occurring between the initial encoding and an act of remembering. As a consequence, any act of recall must be viewed as having a social history.

This basic social-historical character of remembering is widely acknowledged, even by the founding fathers of the psychological study of memory. Bartlett (1932) averred that remembering could not be divorced from current attitudes and environmental and social influences, emphasizing more the social nature of remembering over its historical character. Along similar lines, Vygotsky (1978) emphasized that one could not understand why people remember what they do without placing their acts of remembering into a larger socio-historical context. For him, acts of remembering reflected previous acts of remembering. Even Ebbinghaus (1964) acknowledged that memory was inevitably socially encrusted and historically based. Unlike Bartlett and Vygotsky, his solution was to strip away social and historical influences, and in doing so, reveal the raw material of memory. Our approach here is clearly closer to that of Bartlett and Vygotsky than to that of Ebbinghaus.

In what follows, we focus on two ways that remembering in a social, communicative setting can influence subsequent memory, through social contagion and through retrieval/reexposure effects. One person in a conversation can influence another by virtue of what they say or do not say. When they offer new or misleading information, they may implant this information into the memory of their audience. This is known as social contagion. On the other hand, they can selectively remember information known both to themselves and to their audience. This selectivity sets the stage for the study of retrieval/reexposure effects.

Social Contagion

In a general sense, social contagion means the spread of information, ideas, or practices via interpersonal contact, interaction, and communication. Within the domain of memory psychology, social contagion refers to the spread of a memory from one person to another by means of social interaction, including conversational interactions (Roediger et al. 2001; see Hirst & Echterhoff 2008). In some instances, the speaker can impose a new memory onto the listener, that is, a memory of something that the listener did not experience. In other instances, a speaker imposes on the listener an alternative rendering of something that the listener experienced.

Although Elizabeth Loftus did not initially frame her work this way, experimental work on social contagion can be traced back to her influential demonstration of the postevent misinformation effect (for a review, see Loftus 2005). In typical experiments, participants first watch visual material (e.g., slides, video) depicting an event, often an eyewitness incident like a theft or an accident. They then receive postevent misinformation about the event, for instance, a written narrative about the event that contains several incorrect details (e.g., a stop sign at an intersection). In a final memory test, participants receiving postevent misinformation often falsely report postevent misinformation (e.g., the stop sign) more frequently than do control participants, who do not receive the misinformation.

As to implanting entirely new information, people can come to remember incorrectly that they were lost in a shopping mall as a child simply by listening to a relative's story about the incident (see Loftus 2005). They can also be induced to remember putting slime, a gelatinous toy substance, into a teacher's desk in elementary school (Lindsay et al. 2004). None of these events occurred, yet people reported that their memories of them were extremely vivid and compelling. It is estimated that false information can successfully be implanted in about 30% of study participants through made-up stories told by relatives (Lindsay et al. 2004).

In many of pioneering postevent misinformation studies, the source of the biasing information was a narrative, a slide show, or

Social contagion (of memory): the spread of a memory from one person to others by means of verbal interaction

a film. The person behind these presentations was never mentioned; he or she was implicit. In some recent experiments, however, a physically present person (in our terminology, a speaker) serves as the source of the biasing information. In these experiments, participants first study target material (e.g., slides of household scenes; Roediger et al. 2001), often together with one or more co-respondents (speakers). During the second phase, the participants remember the material collaboratively with the co-respondent(s), who provides some incorrect information. In a final, third phase, participants remember the material again individually. In these studies, the to-be-influenced participant interacts face-to-face with the sources of biasing information. In memory conformity studies, during the collaborative phase, one participant conveys biasing information to another participant (e.g., Wright et al. 2000). The biasing information is usually a different version of a critical detail of the studied material. In confederate studies, again during the collaborative phase, a confederate recalls as naturally as possible to a naive participant several correct but also a few incorrect items (e.g., Meade & Roediger 2002). In conversational remembering studies, during the collaborative phase, naive members of mostly four-person groups converse about a past event or original material. The influence of the group conversation is assessed by comparing individual memories that the group members report before the conversation with individual memories they report after the conversation (e.g., Cuc et al. 2006; for distinctions of experimental paradigms, see Barnier et al. 2008, Wright et al. 2009).

Studies employing these paradigms have consistently revealed the susceptibility of listeners' memory to information communicated by speakers (e.g., Cuc et al. 2006; Gabbert et al. 2003, 2004, 2006; Meade & Roediger 2002; Paterson & Kemp 2006; Roediger et al. 2001; Wright et al. 2000). Such contagion is not a rare occurrence. In one of the first memory conformity studies (Gabbert et al. 2003), more than 70% of the participants incorporated incorrect items mentioned by a cowitness during collaborative recall into their individual memory of the witnessed event.

Results from social contagion studies harken back to classical work on conformity, such as that of Asch (1956) and Sherif (1936), in which participants' judgments about visual stimuli were influenced by judgments of other co-present respondents. A prominent, more recent account attributes social contagion to the confusion people have about sources of information (Mitchell & Johnson 2009). According to this approach, recognition errors arise because listeners have trouble deciding whether a remembered event was mentioned in the original material or in the subsequent narrative, slideshow, or conversation. Because of these source-monitoring problems, participants may falsely claim, for instance, that information contained in the postevent narrative occurred in the original material. The source-monitoring account could be viewed as an informational influence, in that the judgment is based on the belief that information provided by a speaker is true and/or trustworthy.

In addition to informational influences, normative influence may also produce social contagion (Deutsch & Gerard 1955). An influence is normative when one accepts a speaker's position as a norm to avoid social costs of dissent without necessarily believing the speaker. Although most evidence from social contagion studies can be more easily explained by informational influence, Baron et al. (1996) found that normative influence can take precedence when the memory task is relatively easy and when incentives enhance participants' motivation for accuracy.

Moderators of social contagion: How can the effect be altered? Effective moderators can be classified as either primarily cognitive or primarily social-interpersonal. The evidence we review is occasionally based on single studies. Additional research is needed to replicate and to allow a precise meta-analytical examination of moderating factors.

Regarding cognitive moderators, studies indicate that social contagion is greater when the

"contagious" items are consistent with expectations and cognitive schemas (Roediger et al. 2001, Meade & Roediger 2002), when the time for encoding the original material is short rather than long (Baron et al. 1996, Roediger et al. 2001), and when the communicated memory refers to peripheral (versus central) details (Dalton & Daneman 2006, Echterhoff et al. 2007). Furthermore, researchers (Gabbert et al. 2006, Wright et al. 2005) compared memory conformity effects for old information (items presented in the first study phase) versus new information (items not presented in the first phase). The results indicated that it is easier to create new memories than to undo old memories through means of social influence, in that conformity was greater for new than for old items.

Regarding social and interpersonal moderators, it has been consistently found that perceived experts are more successful at imposing their memories onto others than are perceived nonexperts (e.g., Brown et al. 2009). In most of the relevant studies, it is not that the "expert" actually knows more than the participant, but rather the experimenter manipulates the situation so that participants believe that she knows more and hence perceive her as an expert (for an elaborate technique for inducing expertise judgments, see French et al. 2011). Expertise effects are consistent with source monitoring accounts of social contagion. Source monitoring is often effortful, and in many circumstances, error prone. Consequently, as listeners believe in the truth of the speaker's utterances—as they might if they view the speaker as an expert—they may decrease their efforts at source monitoring. In such instances, more social contagion should be present.

Social contagion effects are also stronger when (a) the speaker has more (rather than less) power than the listener (Skagerberg & Wright 2008a); (b) when the speaker is the listener's friend or romantic partner (versus a stranger) (French et al. 2008, Peker & Tekcan 2009); (c) when a listener is more (versus less) anxious about a negative evaluation or when she has a low (versus high) tendency to avoid social contact (Wright et al. 2010); (d) when there are more (versus fewer) speakers suggesting the same memory (Meade & Roediger 2002); (e) when a group of several speakers agrees unanimously on a memory (versus does not agree unanimously due to one or more dissenters) (Walther et al. 2002); (f) when the biasing information is delivered face-to-face by physically co-present speakers (versus delivered in a less immediate way such as in writing) (Gabbert et al. 2004, Meade & Roediger 2002, Paterson & Kemp 2006); and (g) when the biasing information in a multiperson group conversation is produced by the narrator, i.e., the person who dominates the recounting of a past event (Brown et al. 2009, Cuc et al. 2006).

Warnings and resistance. In the studies we have discussed so far, participants had little reason to suspect that the source of postevent information provided erroneous information. As a result, the situation was rife with possibilities for social contagion. But people may realize that their memories may be influenced by what others say, and, accordingly, try to resist any possible influence. To study this resistance, psychologists have warned participants that the postevent narrative or what a speaker says may mislead them (see Echterhoff et al. 2005). Warnings can reduce the extent to which a speaker can influence a listener's memory. Although warnings provided before the misinformation (prewarnings) have been consistently effective (e.g., Boon & Baxter 2000), warnings after the misinformation (postwarnings) also reduce social contagion, but under more limited conditions. For instance, postwarnings are more effective the higher the participants' motive is to be accurate (Blank 1998) and the higher the perceived threat of appearing gullible and being unduly influenced (Echterhoff et al. 2005). Note, however, that even when social contagion effects are reduced by postwarnings, they frequently remain significant (e.g., Echterhoff et al. 2005, Meade & Roediger 2002), testifying to the robustness of the effect.

Interestingly, both prewarnings and postwarnings can come at a cost. Prewarnings, for instance, can have the paradoxical result of increasing social contagion. When listeners have a fragile memory and are uncertain of the veracity of their recollections, they may pay careful attention to what a speaker says. This increased attention may lead listeners to form a more robust memory of what the speaker says, increasing the chance of false memories for the original material. Consistent with this prediction, Muller & Hirst (2010) found that, with a prewarning, memory-challenged listeners will not only find it difficult to discriminate what was in a conversation from what was in the original material, but will also be more likely to falsely recognize new items introduced by a dominant speaker in the conversation. This effect represents the opposite of what a warning is intended to accomplish.

Postwarnings can not only reduce social contagion with a conversation, but they can also increase the incorrect rejection of old material (Echterhoff et al. 2007). Presumably, with a postwarning, people will try to monitor more carefully the source of their memory. As a result of this increased effort, rememberers may correctly reject material that they recollect as originating in the postevent conversation, thereby reducing the effect of the conversation on subsequent remembering. However, they may also incorrectly reject old items that appeared in both the original material and the postevent information. Thus, with a postwarning, rememberers may find themselves falsely rejecting valid event information.

Retrieval/Reexposure Effects

What is remembered in a conversation can affect the subsequent memories of conversational participants not only by implanting new and misleading memories, but also by reinforcing some memory and inducing forgetting for others. We consider the two separately.

Reinforcing existing memories. When a speaker in a conversation repeats something already known to the speaker and/or listeners, by virtue of the repetition, the preexisting memory is reinforced and subsequently remembered better than it would if it had not been repeated (Blumen & Rajaram 2008, Rajaram & Pereira-Pasarin 2007, Weldon & Bellinger 1997). The effect is generally stronger for the speaker (the person doing the remembering) than for listeners (Cuc et al. 2006). The advantage of the speaker could also be viewed as consistent with the generation effect, which established that items generated by a person are remembered better than those supplied by an outside source, such as an experimenter (Slamecka & Graf 1978; for a review, see Mulligan & Lozito 2004).

Retrieval-induced forgetting. When people selectively remember in a conversation, they are not only reinforcing existing memories, but, by not mentioning other memories, they are setting up conditions conducive for forgetting. Stone et al. (2011b) have referred to these unmentioned memories as mnemonic silences and argued that it is important to understand how the silences in conversational remembering shape subsequent memory. The most obvious explanation for why mnemonic silences might promote forgetting is that they allow the memory to decay (Wixted 2004).

Recently, it has been highlighted that more may be occurring than simple decay. Selective remembering may lead to retrieval-induced forgetting (RIF). There are some circumstances in which selective retrieval can facilitate subsequent recollection of the unmentioned material, e.g., when participants are encouraged to think about everything they previously studied (Chan et al. 2006). However, as Hirst & Echterhoff (2008) contended, the rapid give-and-take of a conversation sets up conditions conducive to retrieval-induced forgetting.

The effect on the speaker. RIF was originally studied without any concern about the social context in which selective retrieval takes place (see Anderson et al. 1994). Participants study material, such as category-exemplar word pairs, and then receive additional practice on

some of this material. Some of the unpracticed material is related to the original material, some unrelated. Thus, if participants originally studied *fruit-apple*, *fruit-orange*, *vegetable-broccoli*, *vegetable-pea*, they might receive additional practice only on *fruit-apple*. The experimenter controls for what is or is not practiced by asking participants to complete the stem *fruit-ap____* and only that stem. According Anderson et al.'s nomenclature, the practice item (*apple*) is Rp+ (retrieval practiced), the related, unpracticed item (*orange*) is Rp- (unpracticed but related to a retrieval practiced item), and the unrelated, unpracticed items (*broccoli*, *pea*) are Nrp (not retrieval practiced). A final recall test followed the practice phase. Researchers have repeatedly found not only a practice effect (Rp+ > Nrp), but also evidence of retrieval-induced forgetting (Nrp > Rp-; for a review, see Anderson & Levy 2007). The most widely accepted explanation for RIF involves inhibition (Anderson & Levy 2007, but see, e.g., Perfect et al. 2004). That is, in order to retrieve successfully *apple*, participants must inhibit competing responses. This inhibition lingers, leading to RIF.

RIF is relevant to any discussion of the mnemonic consequences of conversational remembering because selective remembering in a conversational setting also elicits RIF. For example, when speaking about a trip to Coney Island, a speaker might remember the event *Rode on a roller coaster* but leave unmentioned the event *Ate a hot dog*. In this case, the selective retrieval of the roller coaster event will induce forgetting of the unmentioned, but related, hot dog event (Cuc et al. 2007). Selective conversational remembering, then, can not only reinforce the memories offered by a speaker, but can also induce forgetting in the speaker for unmentioned, related memories.

The effect on listeners. RIF is found not only when participants adopt the role of speaker in a conversation, but also when they serve the role of listener (Cuc et al. 2007). When discussing the induced forgetting associated with listening, Cuc et al. used the term "within-individual retrieval-induced

forgetting" (WI-RIF); when discussing the induced forgetting associated with the listener, they used the term "socially shared retrieval-induced forgetting" (SS-RIF). Cuc et al. (2007) argued that SS-RIF should emerge when listeners concurrently, albeit covertly, retrieve with the speaker. With this concurrent, covert retrieval, which can be as effective as overt retrieval in eliciting RIF (Anderson & Bell 2001), the listener will be in a situation similar to that of the speaker. As a result, similar retrieval-induced forgetting should be found for listeners and speakers.

As with WI-RIF, SS-RIF can be found for a wide variety of materials and situations: in a stem-completion task and when it is embedded in a free-flowing conversation (Cuc et al. 2007); for paired-associates and stories, but also for scientific material (Koppel et al. 2011), autobiographical memories (Stone et al. 2011a), and central elements as well as the details of a story (Stone et al. 2010). It also can be found for emotionally charged material, although here the results are not consistent (for work on either WI-RIF or SS-RIF and emotional material, see Barnier et al. 2004, Coman et al. 2009, Stone et al. 2011a).

Recently, Coman et al. (2009) showed that speakers and listeners do not have to study the same material or experience the same event for SS-RIF to occur. Rather, as long as what the speaker says evokes a related memory in the listener, SS-RIF can be found for the listener. Coman et al. examined conversations in which two people talk to each other about how they spent their day on September 11, 2001. Clearly, their autobiographical memories will be different. They did not spend the day in exactly the same way. Nevertheless, there will be similarities: Both would have awakened in the morning, both would have interacted with others after learning about the terrorist attacks in the United States, and so on. That is, the details differ, even if the overall script is similar. John awoke at 9; Mary at 7. John learned of the attacks at 10:15; Mary at 9:10, and so on. The assertion is that one participant's recollection of when she woke up will elicit similar, albeit

Socially shared retrieval-induced forgetting (SS-RIF): retrieval-induced forgetting found for listeners' memory of information selectively omitted (unmentioned) by a speaker

covert, recollections on the part of the other participant. As a result, Coman et al. found that the selective remembering in the conversation induced selective forgetting, both in speaker and listener. If one participant in the conversation mentioned that he learned of the attacks while home, but failed to mention that it was his mother who informed him, both members of the pair, on a subsequent memory test, found it hard to remember who informed them of the attacks. What the speaker and listener mutually forgot was not the same—after all, they had different memories. Nevertheless, they experienced trouble remembering similar classes of information.

Boundary conditions for RIF for both speakers and listeners. WI-RIF and SS-RIF do not occur in all circumstances. For instance, WI-RIF, and presumably SS-RIF, is diminished or eliminated when participants integrate the to-be-remembered material (Anderson & McCulloch 1999). This result may arise because, as Smith et al. (1978) have shown, integration diminishes response competition. Also, a negative mood appears to protect the rememberer from WI-RIF (Bäuml & Kuhbandner 2007). It is not at present known whether these findings also apply to SS-RIF.

Furthermore, and critically, SS-RIF depends on how listeners are monitoring the speaker's utterances. People often listen to speakers with different goals in mind. Jury members presumably monitor for the accuracy of what is recalled during jury deliberations as they try to remember a witness's testimony. On the other hand, a husband might only monitor for something superficial like entertainment value when he listens to his wife recount a funny story at a dinner party. Cuc et al. (2007) asked listeners to monitor either for the accuracy of what a speaker recollected or the fluidity of their recollections. They reasoned that listeners should be more likely to concurrently retrieve, and hence exhibit SS-RIF, when monitoring for accuracy than when monitoring for fluidity. They found that monitoring instructions mattered. RIF was present for both speaker and listener when the listener monitored for accuracy, but RIF was present only for the speaker when the listener monitored for fluidity.

More recently, Koppel et al. (2011) went beyond explicit monitoring instructions and examined how the social relationship between speaker and listener might moderate concurrent retrieval and hence SS-RIF. The listener was told that the speaker, in this case, a lecturer, was or was not an expert on the presented material. There is little reason on the part of the listener to monitor for accuracy if the lecturer is perceived as an expert. Such monitoring is more likely if the lecturer is perceived as a nonexpert. Consequently, and as Koppel et al. found, SS-RIF should be significantly less when participants perceived the lecturer as an expert than when he is perceived as a poorly prepared nonexpert. Clearly, the presence of SS-RIF depends upon the social relation between speaker and listener, in this case, the status of expertise that exists between them. Interestingly, Koppel and colleagues (2011) included in their experiment an assessment of social contagion. As noted above, social contagion increases if the source of the contagion is viewed as an expert. Koppel et al. replicated this result. Hence, expertise apparently has divergent effects on the listener: increasing social contagion and decreasing induced forgetting.

MOVING BEYOND A SINGLE SOCIAL INTERACTION

The previous sections outlined ways in which joint conversational remembering can reshape the memories of speakers and listeners—through social contagion, reinforcement, and retrieval-induced forgetting. It mainly focuses on a single social interaction between two (or sometimes three or four) individuals. But social interactions usually involve a sequence of exchanges. Consider a news event. A group of people might read a newspaper article, listen to a politician speak, and talk to friends about the speech and the newspaper coverage. The friends in turn talk to others with similar experiences. In this way, the memory can be

established, altered, and spread in some form or another across a social network. How do mnemonic influences propagate through a network of individuals? Can we extrapolate from what is known about social interactions between two people to more complex sequences of social interactions?

Bartlett's (1932) work on the serial reproduction task is the classic starting point for studying mnemonic propagation. One person tells another, uninformed person about a story; this second person then tells an uninformed third, and so on. As anyone who has experimented with this task at a party knows, the original story can be radically altered as it passes from one person to the next. Bartlett stressed that the changes are schema consistent. The story is simplified, modified, and rationalized according to the schema held by participants along the chain. Earlier work on the spread of rumors also stressed the role of schema (Allport & Postman 1965).

Kashima and colleagues (for a review, see Kashima 2008) used the serial reproduction task to study the formation of stereotypes. In a representative study, participants received stereotypic information on the characteristics of a fictitious group, the "Jamayans" (Lyons & Kashima 2003). They then studied a story about a member of the group, which contained information about the members that was both stereotype consistent and stereotype inconsistent. The authors examine the conditions under which the stereotype is transmitted in a four-person serial reproduction chain. It was found that stereotype-consistent information about the group member was transmitted along the chain to a greater extent than stereotype-inconsistent information. This finding demonstrated the enhanced transmission of stereotype-consistent information through chains of communication. Notably, the effect was larger when participants believed that the stereotypical view of the Jamayans was shared by their audience. In discussing their findings, Kashima and colleagues focus more on the principles governing transmission than on the effect of the transmission on memory.

One limit of the work on serial reproduction is that it largely examines situations in which new information is spread across a network, with each individual in the network learning the information for the first time. But, as our illustration about learning and talking about a current event makes clear, there are many examples of people already having a memory when they listen, for instance, to a politician speak about a current event or when they talk to each other about the event. The work on single social interactions suggests that these exchanges might reshape participants' memory, but does this influence propagate through more than one social interaction? After listening to the politician's speech, will the politician's influence, in turn, affect subsequent conversations and propagate through these conversations to produce a lasting impact on memory? If mnemonic influences are limited to a single exchange, they may have little relevance in the real world. However, if they propagate through a sequence of exchanges, they may have a great bearing on what people finally remember about the past.

Recently, in an effort to move beyond the effects that follow a single conversation, Coman & Hirst (2012) traced how RIF can propagate through a series of social interactions. They focused on two types of social interactions that occur in everyday life: (*a*) one-way listening, as when one listens to a lecture or a political speech, and (*b*) conversational interaction. They looked at how listening to a lecture reshapes memories of learned material and whether the influence of the lecture propagates into a conversation and then through the conversation to a final recall test. Such sequences are common in everyday life, as, per our previous example, when someone reads an account of an event in a newspaper, then listens to a presidential address, and then talks to friends and relatives about the event. Coman & Hirst (2012) assessed practice effects and RIF in such sequences. They found, not surprising given their previous work, that the lecturer influenced participants' memories, as measured by practice effects and RIF. Moreover, in reaching beyond a single social interaction, they found that, when

Serial reproduction task: method to study (often schema-consistent) changes of information passed from one person to another in a series of dyadic interactions

Saying-is-believing paradigm: the effect of audience tuning on speakers' subsequent representation of the topic (including memory)

Shared reality: commonality of inner states (e.g., judgments, beliefs, attitudes, feelings) about a referent topic, satisfying epistemic, and often also relational, motives

conversations were between like-minded individuals, these influences shaped what was remembered in the conversation. In the end, when examining individuals with similar attitudes, the lecturer's influence on participants' memories propagated into a final recall test, suggesting a lasting influence. The results indicate that mnemonic influences exhibit a principle of transitivity as they propagate through a sequence of social interactions. Moreover, and importantly, as they propagate through the exchange, their effect increases rather than decreases. Politicians can have a profound influence on what people remember, even when their listeners turn to each other to discuss the issue in an effort to remember the original material as best as they can.

Coman & Hirst's (2012) study is only a first step, in that they examined propagation in a small sequence of social interactions. Their results, however, suggest that researchers could understand propagation in larger networks by (*a*) considering the effects of a single social interaction on memory and then (*b*) extending what is observed at this local level to the larger network. In other words, researchers might observe macrolevel principles of a network of individuals emerge in predictable ways out of microlevel processing. This assertion is a central assumption in the growing field of agent-based modeling and related work on network theory (e.g., Epstein 2006). Coman & Hirst (2012) explored how microlevel processing in a single social interaction shapes the emergent memories in a small network. The next step might be to use agent-based modeling techniques and network theory to extend the approach to larger networks.

MOTIVES IN CONVERSATIONAL REMEMBERING AND THE CREATION OF A SHARED REALITY

Our focus is on the impact of conversational remembering on memory, not the motives that shape what is said in a conversation (for discussions of communication goals, see McCann

& Higgins 1988; for discussions of motives for social sharing and autobiographical recounting, see Pasupathi 2001, Rimé 2007). But motives are important not only in shaping what is said, but also for the impact of conversations on subsequent memory. In discussing SS-RIF, for instance, we noted that the way in which the listener monitors the speaker matters. SS-RIF emerged, for instance, when listeners monitored for accuracy, not fluency (Cuc et al. 2007).

One intensely studied area pertinent to the study of motives and conversational remembering is the effect audience tuning has on the subsequent memory of the speaker. As we noted, speakers tune what they say to an audience, often taking into account the attitude of the audience. The effect of this tuning on subsequent memory has been studied extensively in the context of the saying-is-believing paradigm (Higgins & Rholes 1978; for a review, see Echterhoff et al. 2009a). In these studies, participants are given several passages presenting a target character in ambiguous terms (e.g., the passage, "Donald uses coupons, buys things on sale, avoids donating money or lending money to friends") that can be labeled as either "thrifty" or "stingy". They are then told to describe Donald to an audience that either likes or dislikes him. Participants tune their message to their audience, describing the character as "thrifty" to the favorable audience and as "stingy" to the unfavorable audience. Importantly, in a final recall test, where participants are told to recall the initial story, they remember the character in a manner consistent with the tuned message. The participants will come to believe and remember what they said to their audience rather than what they originally learned about the character. Speakers' expectations about the beliefs or attitudes of an audience often shape not only their message, but under certain conditions, also shape their memory (Echterhoff et al. 2009a).

The presence of this memory bias appears to depend on the motives of the speakers, in particular, whether they are motivated to create a shared reality with the audience. Shared

reality is conceptualized as the motivated and experienced commonality between one's own and others' representations and evaluations of the world (Echterhoff et al. 2009a). In order to demonstrate the role of shared reality in the saying-is-believing effect, Echterhoff et al. (2008) asked German participants to describe the target person to a Turkish audience (a minority outgroup in Germany) or to a German audience. Both the Turkish audience and the German audience either liked the target or disliked him. Interestingly, participants made greater efforts to tune their message to their Turkish audience than to their German audience, so they seemed motivated to tune to their audience. However, the tuning to the Turkish audience had no effect in terms of memory restructuring. That is, although they described the target consistent with the Turkish audience's attitudes, the tuning did not translate in memory restructuring, as it did in the German audience condition. According to Echterhoff et al. (2008), the key difference was in the motive underlying audience tuning: creating a shared reality with a German ingroup audience versus complying with (politeness, egalitarian) norms with the Turkish outgroup audience.

The creation of a shared reality can satisfy two core human motives—epistemic and relational (Echterhoff et al. 2009a). Epistemic motives refer to the need to achieve a valid and reliable understanding of the world and to establish what is real (Higgins 2012). Humans are motivated by what Bartlett (1932) called effort after meaning, a fundamental need to understand the events and circumstances of their lives. The urgency of such epistemic needs increases with the uncertainty or ambiguity that individuals experience about a target entity. Relational motives refer to the need to affiliate and feel connected with others.

In the saying-is-believing studies, the ambiguity of the original information about the target supplied in the experiments should elicit epistemic motives to reduce the uncertainty. Speakers achieve this reduction, at least to some extent, by incorporating into their view of the target the audience-tuned message and thus create a shared reality with the audience (see Echterhoff et al. 2009a). Evidence from several experiments is consistent with the prediction that speakers' motivation to create a shared reality varies with (*a*) their need to reduce uncertainty about a target (Kopietz et al. 2010), (*b*) the extent to which their audience tuning serves epistemic goals (Echterhoff et al. 2008), and (*c*) the appropriateness (trustworthiness) of the audience for creating a shared reality (Echterhoff et al. 2005a, 2009b; Kopietz et al. 2009). Critically, under these motivational conditions, the result is a "shared reality" between speaker and audience about the target person.

COLLECTIVE MEMORY

Conversational remembering can be viewed as a social practice that promotes the formation of a collective memory (for a discussion of collective memories formed through communication, see Assmann 1995). By collective memory, we mean memories shared across a community that bear on the identity of that community (see Manier & Hirst 2008 for further elaboration). The study of collective memory has a long history, dating back to the original work of Durkheim's student Maurice Halbwachs (1950/1980). Social scientists studying collective memory often focus more on less-ephemeral means of promoting the formation of collective memories than on conversations, e.g., memorials and commemorations. Still, there is agreement that when it comes to vernacular or informal collective memories, especially those formed by the populace in a repressive society, conversations are a main means through which collective memories are established and maintained. For instance, only through conversational interactions could Lithuanians of Lithuanian descent construct a collective memory around national historical events not found in the Russian textbooks they studied in school (Schuman et al. 1994).

Recent attempts to build a naturalistic account of culture nicely divide the study of collective memory into two distinct subtopics: social practices and psychological mechanisms. Scholars interested in a naturalistic approach

often likened the study of culture to an epidemiology of beliefs (e.g., Hirst & Manier 2008, Sperber 1996; see also the work on memes, e.g., Dawkins 1976). Just as epidemiologists study why some, and not other, viruses spread quickly across a community and survive over time, so can students of culture (read here, collective memory) study why some, and not other, beliefs and memories spread quickly across a community and survive. The spread of a virus—or a memory—will depend on at least two factors, that is, the social practice of a community and the mechanisms specific to the virus or memory that ensure survival. When trying to understand the spread of HIV among the gay community in the 1980s, epidemiologists discuss possible social practices that might foster its spread, such as frequent visits to bathhouses. They also underscore various characteristics of the virus itself that make the social practices effective, e.g., the fact that it takes months after infection for any health consequences to appear. In a similar way, when it comes to the study of collective memories, an examination of both mnemonic/social practices and underlying psychological processes is essential to understanding the formation of a collective memory. Clearly, mnemonic/social practices, including the practice of conversing, matter. For instance, the accuracy of memories for public traumatic events, such as those of 9/11, depends on the extent to which people talk about the event (Hirst et al. 2009). But psychological mechanisms also play a role (for a more extensive discussion of this point, see Hirst & Manier 2008; for a psychological approach to collective memory that does not involve communication, see Shteynberg 2010; see also Brown et al. 2009, Curci et al. 2001, Sahdra & Ross 2007, Schuman & Scott 1989).

Our review of the literature on conversational remembering articulates some of the psychological mechanisms that might be involved in the formation of collective memories. Indeed, the review suggests that the human memory system seems designed, in part, to promote the formation of collective memories through conversations. Social contagion, rein-forcement, and retrieval-induced forgetting are all means by which speakers and listeners can come to share a similar rendering of the past. As a speaker implants a memory into listeners, the speaker and listeners come to share the same implanted memory. As a speaker restates a past event, both speaker and listeners rehearse the memory and subsequently find it more accessible. And as a speaker leaves some memories unmentioned, the unmentioned related memories are more likely forgotten in subsequent acts of remembering than the unmentioned, unrelated memories, again, for both speaker and listeners.

This convergence is well documented. Work on memory conformity and conversational remembering studies establishes that memories of participants in a conversation overlap more after the conversation than before the conversation, in part because of reinforcement and in part because of social contagion (Cuc et al. 2006, Wright et al. 2000). Stone et al. (2010) have similarly shown that there is more evidence of collective remembering and collective forgetting after a conversation than before a conversation. Critically, they established that the pattern of collective remembering and collective forgetting is just what one would expect from practice effects and retrieval-induced forgetting. Coman & Hirst's (2012) study of mnemonic propagation revealed that collective memories solidify as mnemonic influence transfers through a sequence of social exchanges.

Of course, psychological mechanisms other than social contagion, reinforcement, and retrieval-induced forgetting also govern the formation of collective memories through conversation. Bartlett (1932) underscored the role of schema. Of particular relevance in this regard is Wertsch's (2002, 2008) work on schematic narrative templates. According to Wertsch, a community's schematic narrative template shapes what people remember about their national historical past and how they remember it. In contrast to specific narratives, these are generalized structures used to generate multiple specific narratives with the same basic plots. Russians, for instance, often render historical episodes employing the following template:

(*a*) Russia is peaceful and does not interfere with others. (*b*) A foreign enemy treacherously attacks Russia without provocation. (*c*) Russia is almost fully defeated as it suffers from the enemy's attempts to destroy it as a civilization. (*d*) Through heroism, and against all odds, Russia and its people triumph and succeed in expelling the foreign enemy, thus justifying its status as a great nation. The Russian rendering of the Napoleonic invasion and defeat, for instance, nicely reflects this template.

Not every nation has a close-to-defeat-then-triumph template. As we said, they are often community specific. The United States has several quite different templates, for instance, "the mystique of Manifest Destiny" and the "reluctant hegemon." These guide Americans' rendering of their historical past just as the triumphal template guides that of Russians.

Although schematic narrative templates are often established through formal means, in many instances, they can be established only through conversation. The conversationally derived templates, in turn, shape subsequent conversations and, through these conversations, promote the formation of a collective memory. It is through conversational interactions that Estonians reject the Russian-derived narrative template of "liberation of the proletariat" and develop an independent narrative of their continued subjugation by Russia (Wertsch 2002). Similarly, the Camisards of the south of France adopt a distinctive template of separatism and religious antagonism to account for, among other things, the revolt of 1702–1704 (Fentress & Wickham 1992).

It appears, then, that conversations repeatedly contribute to the formation of collective memory. They do so by reshaping memory in similar ways across a group, through psychological phenomena such as social contagion, rehearsal, or retrieval-induced forgetting. And they do so by fostering or altering schema. Government and other sources of power have formal means for providing social practices that engage each of these psychological phenomena. Conversations can also occur outside of this institutional, or authoritarian, framework and promote the development of alternative collective representations of the past.

CONCLUSION

Memory researchers have always known that social influences shape what is remembered. Traditionally, following the Ebbinghausian program, they have reacted to this knowledge by carefully controlling for social influence, thereby revealing the "raw material" of memory. One cannot, however, predict what people remember in daily life from what one learns from studying this raw material. Remembering is always embedded within a social context.

This review has focused on understanding how one type of social context, conversation, shapes memory. People are constantly talking to each other about the past. This continuous communication profoundly alters what people remember as they converse and what they remember subsequent to the conversation. In particular, acts of remembering within a conversation supply a context in which conversing individuals can influence each other's memory. This mutual influence can lead to a convergence among participants on a shared representation of the past. This possibility suggests that the usual characterization of memory implantation or forgetting as flaws or "sins" of memory may not be entirely accurate. They may also be treated as assets in that they promote the formation of a collective memory (Hirst 2010). Given the sociality of humans—and the possible critical role collective memories might play in undergirding this sociality—one can see why the malleability and unreliability of memory—and in particular, social contagion and induced forgetting—might have been preserved through evolution.

This latter point underscores the benefits of opening up the study of memory to the social settings in which remembering takes place. One might not have realized how well tuned the memory system is for promoting the formation of collective memories if one had not examined conversational remembering. Twenty years ago, social, and, in particular, conversational

aspects of remembering would not have figured in most psychological discussions of memory. As this review makes clear, not only is there a substantial and ever-growing literature, but the extant research allows psychologists to reassess how memory functions in daily life.

SUMMARY POINTS

1. Remembering in a conversation is always selective. People remember more than they might when remembering alone (collaborative facilitation), but less than the sum of the potential of all conversational participants (collaborative inhibition).

2. One participant in a conversation can influence the memory of other participants in various ways, including through social contagion, rehearsal/reexposure effects, and retrieval-induced forgetting.

3. The effect of one member of a conversation on her own or others' memory must be understood in social terms since the effect is moderated by social factors.

4. It is difficult to eliminate social influences on memory in conversations. The presence of others in the conversation typically leads conversational participants to influence the memory of the others.

5. The social influences present in a conversation produce, in many instances, similar effects on both speaker and listeners. As a result, a conversation may serve as a social practice promoting the formation of a collective memory.

6. Although the social influences in a conversation often affect speaker and listeners in similar ways, at least one difference is worth noting. For speakers to reshape their own memories, they often need to be motivated to create a shared reality with the listener. For the speaker to reshape the memories of the listener, the motivation of the listener is often critical, but not the motivation of the speaker. Regarding the speaker, then, the influences of communication on listeners' memory can be unintended and hence can be understood as emergent side effects of conducting conversations.

DISCLOSURE STATEMENT

The authors are not aware of any affiliations, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

ACKNOWLEDGMENTS

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Psychology**

Volume 63, 2012

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