Predicting others’ memory performance: The accuracy and bases of social metacognition

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ABSTRACT

Successful teaching, effective advertising, and happy interpersonal relationships depend upon accurately anticipating what others will remember. Across three experiments, we tested how precisely subjects judged the mnemonic effectiveness of cues for supporting other subjects’ episodic memories. Some subjects generated cue-target word pairs and made judgments of learning (JOLs) for these word pairs while other subjects studied the pairs and made JOLs. Across all three experiments, subjects’ JOLs for others were more accurate than chance, but less accurate than subjects’ JOLs for themselves. Further, JOLs for others were similarly accurate across cues that subjects generated for others and cues that subjects read but did not themselves generate. Idiosyncratic cue generation processes impacted subjects’ JOLs for others; however, this bias was not the primary reason for the inaccuracy of JOLs for others. Rather, our results suggest that the accuracy of judgments about others’ memories suffers because people do not have access to the personal idiosyncrasies of others’ encoding and processing.

Introduction

Predicting what other people will remember has significant social, educational, and economic consequences. Successful teachers, effective negotiators, electable politicians, and productive advertisers rely upon the ability to put themselves in others’ shoes in order to generate cues that others will strongly remember (Nickerson, 1999, 2001). Similarly, creating and maintaining friendships, communicating effectively, and making plans rely upon our abilities to anticipate the likelihood of other people retaining task-relevant information and to generate cues that will support their recall (Selman, 1981).

Despite these processes being “indispensable to human social functioning” (p. 85; Nelson, Kruglanski, & Jost, 1998), little research has examined metacognition related to others’ memories. In the current experiments, we examined how accurately subjects judged the effectiveness of mnemonic cues for others, and we analyzed the bases upon which subjects made those judgments of effectiveness. These topics lie at the intersection of three important areas in cognitive psychology: cue generation, metacognitive monitoring, and perspective-taking. We will outline questions of interest in each area in turn before describing the current experiments in greater detail.

Generating mnemonic cues for self and others

When taking notes, naming computer files, and outlining readings, learners use sophisticated strategies to generate external mnemonic cues in order to reduce the demands placed on the memory system and to support future retrieval. Learner-generated cues can lead to very high levels of memory performance, even for long lists of items (Bäckman & Mäntylä, 1988; Hunt & Smith, 1996; Mäntylä, 1986; Mäntylä & Nilsson, 1983, 1988). One reason for the effectiveness of learner-generated cues is that they can be more distinctive (i.e., point to fewer possible targets) and more idiosyncratic as compared to, for instance, experimenter-provided cues (Tullis & Benjamin, 2015b). For instance, when given the target word “sibling”, a strongly-associated generic cue for the target might be “sister”, while an idiosyncratic, self-generated mnemonic cue might be the name of one’s own sister (e.g., “Gillian”).

Learners adjust the types of cues they generate when they know those cues will be used by other people. For instance, when generating mnemonic cues for others as opposed to themselves, subjects generate cues that have greater normative associative strength to the target word, but point to more possible targets (Tullis &
Benjamin, 2015a). Further, when generating cues for themselves, subjects create unique and idiosyncratic cues (as described above), but when generating cues for others, they generate more shared (or “common”) cues (Kraus, Vivekananthan, & Weinheimer, 1968). These adjustments effectively support others’ recall: Cues that are generated with the intent of being used by others lead to more accurate recall for those individuals than cues generated without such intent (Tullis & Benjamin, 2015a).

Predicting memory performance of others

However, perspective-taking in cue generation does not end with generating the cues. Another important task is judging the effectiveness of those cues in supporting others’ memory performance, such as determining which of several candidate advertising slogans is the most memorable. Although little is known about this topic, some plausible hypotheses are suggested by research on how learners make predictions about their own recall. When subjects can rely upon personal mnemonic experiences to make predictions, their judgments of learning (JOLs) are very accurate at predicting which items they will remember and which they will forget (Dunlosky & Nelson, 1994). However, people usually do not have direct access to the personal mnemonic experiences of others, so their predictions regarding others’ memories may be much less accurate than predictions of one’s own memories. This exemplifies the cognitive challenge of perspective-taking—making judgments that reflect someone else’s knowledge and experience rather than one’s own.

Perspective-taking

Predicting what others will remember necessitates stepping outside of one’s own experiences and taking the perspective of others. Although research generally suggests that taking another’s perspective is difficult and subject to systematic errors (Hanna, Tanenhaus, & Trueswell, 2003; Keysar, Barr, Balin, & Brauner, 2000), perspective-taking is a domain-specific skill that may be easier or harder in some tasks than others (Ryskin, Benjamin, Tullis, & Brown-Schmidt, 2015). Thus, there is a need to consider how—and how effectively—people take perspective specifically within the domain of creating and judging the effectiveness of mnemonic cues. In the present study, we contrast four hypotheses—inspired by the broader literature on why perspective-taking is frequently difficult—about how accurately people can judge the effectiveness of mnemonic cues for other learners.

Under what we term the misleading-information hypothesis, perspective-taking is difficult because people struggle to ignore their own knowledge when attempting to take the perspective of others (i.e., the “curse of knowledge”; Birch, 2005). Across many paradigms and stimuli, people’s own knowledge and experiences influence their messages for others even when they are irrelevant to others’ perspectives (Birch, 2005; Brown-Schmidt & Hanna, 2011; Camerer, Lowenstein, & Weber, 1989; Kelley & Jacoby, 1996; Stone, Baron-Cohen, & Knight, 1998). According to this hypothesis, judgments about others’ knowledge are contaminated by irrelevant (or systematically misleading) aspects of one’s own experience, and consequently people should show some ability to predict others’ memory, but with reduced accuracy. For instance, Tullis and Benjamin (2015a) demonstrated that cues for the self benefit from different features than cues from others, so if subjects erroneously predict the memories of others using the same mnemonic indicators as they might use to predict their own memories, their predictions may be biased. Crucially, in this view, it is the presence of misleading information (i.e., one’s own experience) that contributes to reduced accuracy in predicting others’ memory performance.

A second source of difficulty in perspective-taking may be a lack of adequate knowledge about a particular person’s perspective. Under the inadequate-information hypothesis, predicting of others’ memory may show reduced accuracy because people simply have less information about other learners than about themselves. In particular, subjects lack access to others’ idiosyncratic mnemonic experiences, which may serve an essential, diagnostic role in predicting episodic memory performance (Lovelace, 1984; Underwood, 1966). That is, this hypothesis also predicts that judging others’ memories should be more difficult, but this difficulty reflects an absence of information rather than the presence of misleading information. Some evidence in favor of the inadequate-information hypothesis comes from Vesonder and Voss (1985), who divided subjects into (a) learners who studied a list of sentences and predicted whether they would remember the sentences on a later memory test and (b) observers who predicted whether the learners would remember each studied sentence. Observers’ judgments of which sentences the learners would and would not remember were near chance, but increased sharply when observers were provided information about the learners’ idiosyncratic performance (i.e., the learners’ prior success or failure at retrieving specific sentences). This pattern suggests that the source of perspective-taking failure in this task was a lack of information, rather than an inability to use information about the learners’ subjective encoding experiences.

The literature also suggests two other, more extreme hypotheses about perspective-taking. One, which we term the equivalent-accuracy hypothesis, is that learners should be equally accurate at predicting another person’s future memory as predicting their own future memory. This hypothesis is suggested by the more general proposal (Nelson et al., 1998) that taking the perspective of one’s own future self may have much in common with taking the perspective of another person: Both require judging a mental state different from one’s immediate mental state (e.g., Fraundorf & Benjamin, 2014). Predicting others’ memories and predicting one’s future memory performance may rely on the same cues and processes (Jost, Kruglanski, & Nelson, 1998), and consequently result in similar outcomes. Finally, under what we term the no-accuracy hypothesis, people may completely fail to predict what other learners can and cannot remember. This hypothesis is suggested by the finding of Vesonder and Voss (1985) that, without specific information about other learners’ mnemonic experiences, observers’ predictions were no more accurate than chance.

The relative contributions of the misleading influence of one’s own perspective and inadequate information about another’s perspective to perspective-taking failures are unclear. Moreover, because perspective-taking is a domain-specific ability (Ryskin et al., 2015), testing perspective-taking abilities across many situations is crucial in order to identify specific perspective-taking strengths and weaknesses. Here, we do so in the domain of creating and judging mnemonic cues.

Overview of experiments

Across three experiments, subjects generated mnemonic cues and judged their effectiveness for others. We directly evaluated subjects’ metacognitive monitoring by testing how accurately they predicted their own and others’ memories. Second, we examined the bases on which people make judgments about the efficacy of mnemonic cues for others: Do their predictions of memory appropriately reflect the same cue characteristics that actually correlate with actual memory?

Cue characteristics

To characterize the efficacy of cues and the bases upon which subjects make metacognitive judgments, we analyzed three char-
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