Making Sense of Memory

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Abstract The current work explores how people make recognition and belief judgments in the presence of obvious repetition primes. In two experiments, subjects received a 200-ms prime ("cheetah"), either before or after reading a trivia question ("What is the fastest animal?") but always before being presented with the target answer ("cheetah"). Results of two experiments showed that repetition priming decreased "old" claims (Recognition – Experiment 1), while it increased truth claims (Belief – Experiment 2). Furthermore, repetition prime placement affected recognition but not belief. Combined, these results suggest that dissociations in memory performance are a natural outcome of task and processing demands and reflect the dynamic, flexible nature of memory.

There is no part of mind, no thought or feeling or memory or imagination, that we can catch at rest and watch unchanged; thought and feeling are changing, moving, shifting from instant to instant. (Titchener, 1899, p. 7)

Much evidence points to a qualitative difference between "remembering" a specific event in time (e.g., I walked in the park yesterday), and "believing" that something is true (e.g., the capital of Norway is Oslo) (Tulving, 1972, 1983, 2002). According to Tulving, remembering an event is thought to be place, time and context dependent, and is controlled by the episodic memory system. Believing that something is true, in contrast, results from the accumulation of information over time, is largely context independent, and has been ascribed to the semantic memory system.

Since Tulving's original conceptualization of the episodic/semantic memory distinction, several additional memory systems have been posited. These include the procedural and declarative systems (Cohen & Squire, 1980), implicit and explicit memory systems (Graf & Schacter, 1985), the perceptual representation system (Tulving, Schacter, & Stark, 1982), and the primary (working) memory system (Schacter & Tulving, 1994).

As an alternative to structural accounts that classify memory by types or systems, several theorists have opted to explain performance differences on various memory tasks as resulting from the specific processing operations required by those tasks (e.g., Kolers, 1973; Kolers & Roediger, 1984). Processing or attribution accounts attempt to illuminate the particular processing demands of a given task, in addition to the relative match between processing experiences present at both encoding and retrieval (e.g., Blaxton, 1989; Masson & MacLeod, 1992; Morris, Bransford, & Franks, 1977; Tulving & Thomson, 1972). The present work aims to show that performance differences on memory tasks can be understood by closely examining the processing requirements of those tasks. The present work is not aimed at presenting a critical test between structural and processing theories of memory.

The Effect of Repetition on Recognition and Belief

Working squarely within the attribution camp, Jacoby and Whitehouse (1989) demonstrated that processing fluency (speed of processing) and its subsequent attribution to a particular source depend upon the availability of potential sources to explain that fluency (see also Higham & Vokey, 2000). Subjects studied words for a standard recognition task. Later, words were presented after repetition or nonrepetition context (prime) words (e.g., "duck – duck" vs. "ring – duck"). Repetition primed words increased the speed with which subjects processed target words (referred to as fluency, resulting in a feeling of familiarity that arises from the attribution of fluency to the past). However, subjects attributed this familiarity to different sources – to the repetition prime or to training – depending on whether or not they were aware of the prime words. Additional work supports the fluency attribution account of familiarity (e.g., Jacoby, Kelley, & Dywan, 1989; Lindsay & Kelley, 1996; although see Whittlesea & Williams, 2001). Processing fluency has been shown to affect a variety of judgments, including exposure duration (Witherspoon & Allan, 1985), feelings of knowing (Reder, 1987), perceptual clarity (Whittlesea, Jacoby, & Girard, 1990), liking (Bornstein & D'Agostino, 1992), knowing rather than remembering

(Rajaram, 1993), and truth (Kelley & Lindsay, 1993).

Although they did not frame the issue in terms of processing fluency, Hasher, Goldstein, and Toppino (1977) originally demonstrated that repeating plausible statements leads to greater plausibility ratings, regardless of the statements' truth. Subjects rated the truth of various statements (e.g., "the thigh bone is the longest bone in the human body") on three occasions two weeks apart. Repeated items received higher validity ratings than nonrepeated items. Additional work has linked this effect to processing fluency and has demonstrated the robustness of the effect (cf. Bacon, 1979; Begg, Armour, & Kerr, 1985). According to one account, statement repetition produces a combination of familiarity, which occurs automatically, and source recollection, which requires intentional control (Arkes, Hackett, & Boehm, 1989; Begg, Anas, & Farinacci, 1992).

The Current Work

The current work examines how people make recognition (remembering) and truth (believing) judgments in the presence of obvious repetition primes. Nearly all work to date involving the effect of repetition on truth has utilized a training and test procedure whereby subjects read true and false statements or portions of statements and later rate studied and novel statements for plausibility. By contrast, repetition in the current set of studies only involved a single word and occurred directly in the context of the trivia question. Moreover, subjects were fully aware of the repetition. Based on Jacoby and Whitehouse's (1989) data, if subjects realize that repetition is a source of processing fluency, they should discount the fluency when making truth decisions, resulting in *lower* truth claims (see also Oppenheimer, 2004).

In Experiment 1, subjects studied words for a later memory test. At test, subjects read a trivia question that was posed as a statement (e.g., "fastest animal"), and received either a repetition prime (e.g., "cheetah") or an unrelated prime (e.g., "blender") before deciding whether the target answer (e.g., "cheetah") had appeared in a training phase. The prime word appeared either before or after the trivia question. Experiment 2 was identical to Experiment 1, except that subjects decided whether the target answer was true or false instead of old or new.

The present study addresses two main questions: 1) How does fluency arising from repetition priming affect remembering and believing? 2) How does the availability of fluency's source affect remembering and believing? Previous work has shown that prior exposure to target words, repetition priming, and the truth of an answer all increase processing fluency (Begg et al., 1992; Bernstein, 2002; Jacoby & Dallas, 1981).

There is reason to expect that recognition and belief will react differently to repetition priming and to the placement of the prime. On the surface, the nature of recognition is to determine whether a particular event occurred at a particular time in the past. As such, recognition seems to rely extensively upon the attribution of processing fluency to a particular source. In fact, one of the primary tasks of recognition memory could be to disambiguate potential, competing sources of processing fluency to arrive at the knowledge that the item or event was experienced at a particular time in the past. In the present work, if subjects are aware that repetition primes are a source of processing fluency, they might discount the fluency and overcorrect, resulting in fewer claims of old (Jacoby & Whitehouse, 1989). However, if subjects are made less aware of the repetition primes, by placing the primes in the background, this may obscure the source of processing fluency, thereby resulting in *greater* claims of old or a null effect.

In contrast to recognition memory, the nature of belief (truth judgment) is to determine whether a particular piece of information (general knowledge) is true. Knowledge of when and where the information was acquired can aid validity judgments (e.g., when the source of a statement is credible). However, in comparison to recognition, belief may not depend on precise source attribution. Therefore, the placement of a repetition prime should have little effect on belief. As Begg et al. (1992) noted, if subjects think that there has been repetition, they will believe.

The present work involves a systematic exploration of repetition priming effects on both recognition and truth judgments. Past studies have examined the effect of repetition primes on recognition, and explored the effect of statement repetition on belief. The structure of Experiments 1 and 2 in the current study is identical, permitting a careful and direct comparison of how and when repetition priming affects remembering and believing.

Experiment 1

Method

Subjects. Seventy-two Simon Fraser University students received course credit for their participation. Half the subjects received primes before the trivia question, and half received primes after the trivia question.

Design. Experiment 1 followed a 2 (Truth of Target: True/False) x 2 (Oldness of Target: Old/New) x 2 (Prime Type: Repetition/Unrelated to Target) x 2 (Prime Placement: Before Question/After Question) mixed design. Truth of target, oldness of target, and prime type were within-subject factors, while prime place-

TABLE 1
Probability of Claiming Old Based Upon the Oldness and Truth of the Target and the Type of Prime (Repetition or Unrelated) in Experiment 1

	Old				New			
	True		False		True		False	
	Rep	Unrel	Rep	Unrel	Rep	Unrel	Rep	Unrel
Prime Before Q	.73	.77	.73	.72	.16	.16	.16	.16
SEM	.03	.03	.02	.02	.02	.02	.02	.02
Prime After Q	.69	.75	.66	.71	.13	.16	.13	.15
SEM	.03	.03	.03	.03	.02	.02	.02	.02

Note. Rep = repetition prime; Unrel = prime unrelated to target; Prime Before Q = Prime appeared before the trivia question; Prime After Q = Prime appeared after the trivia question; SEM = between-subjects standard error of the mean. The pooled within-subjects standard error for the Prime Before Q and Prime After Q conditions was 0.018 and 0.020, respectively.

ment was a between-subject factor.

Materials. Stimuli consisted of 75 general knowledge questions taken from Nelson and Narens (1980), with a .63 mean probability of being correctly answered (Range = .23 to .92), according to the Nelson and Narens norms. Ninety-three additional questions were created to approximate the range of topics and the level of difficulty of the 75 questions, bringing the total to 168 questions. Three additional practice trivia questions were added to familiarize subjects with the procedure. Plausible foils were created for each question (e.g., “fastest animal in the world – leopard [cheetah]”). Ninety-four words appeared in training. Of these, the first and last five words were practice items meant to reduce primacy and recency effects. Practice items were not related to any of the trivia questions or target answers. The remaining 84 training words were chosen semirandomly such that one-half were correct answers to trivia questions, while the other half were plausible foils to trivia questions. Either the correct answer *or* the plausible foil referring to the same question appeared during training. Questions, primes, and answers were freshly randomized for each subject such that primes matched targets on one-half of the trials. Unrelated primes were medium-frequency bi-syllabic words, unrelated to any of the trivia questions or target answers. None of these unrelated primes appeared during training. All materials appeared on a computer monitor, and subjects responded using a button box.

Procedure. During training, subjects read individual words aloud and tried to remember them for a later memory test. Individual words appeared on the centre of the computer screen until subjects pressed a button indicating that they had read the word. After the button press, the screen went blank for one second, followed by the next training word. At test, subjects made recognition decisions on words that appeared as target answers to trivia questions. A 200-ms. prime word flashed either before (Prime Before Question Group) or after (Prime After Question Group) the trivia question. The prime was followed by a mask comprising a series of 15 ampersands that remained on screen for 500 ms, followed by a 300-ms blank screen. Subjects were told to remember the prime for a later memory test that never occurred. Subjects pressed a button when they had read and understood the trivia question. This button press was followed 800 ms later by either the prime or the target answer, depending on the group being tested. Examples of a single trial for the two groups of subjects were: “enamel – &&&& – outer coat of tooth – enamel” (Prime Before Question); “outer coat of tooth – enamel – &&&& – enamel” (Prime After Question).

Subjects decided whether the target answer appeared in the training list or not by pressing the left or right button, respectively. The delay between the recognition decision and the next question varied randomly between 1,865 and 2,865 ms to prevent subjects from accurately anticipating the onset of the next trial. Subjects were asked to make recognition decisions as quickly as possible, while maintaining accuracy. Subjects were also told that: 1) the trivia question was there to help them remember the target; 2) the prime sometimes matched the target (in fact, the prime matched the target on half the trials); 3) the target was the correct answer to the trivia question half the time; and 4) the target was a word studied during training half the time. The training and test phases were separated by a three-minute break, during which time the experimenter engaged the subject in conversation. Subjects were tested individually.

Results and Discussion.

Table 1 lists the probability of claiming “old” for the different target types in Experiment 1. Analyses were

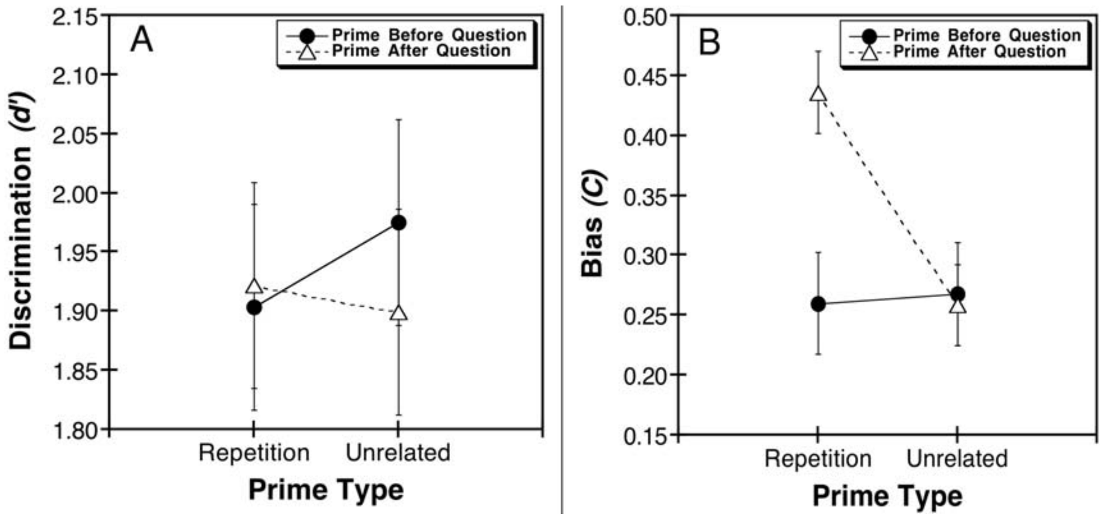

Figure 1. Discrimination (Panel A) and Bias (Panel B) as a function of whether the target answer was repetition primed or not, and whether the prime appeared before or after the question in Experiment 1. Error bars represent within-subject standard error of the mean (Loftus & Masson, 1994).

conducted using discrimination (*d'*) and bias (*C*) values as the dependent measures (Macmillan & Creelman, 1992) and using prime type (repetition vs. unrelated) and truth of target (true vs. false) as within-subject factors, and prime placement as a between-subject factor. *d'* and *C* were calculated using adjusted hit and false alarm rates to avoid undefined discrimination and bias values. In this procedure, 0.5 is added to the hit and false alarm rates, respectively, and then each is divided by N + 1, where N is the number of old or new trials, respectively (see Snodgrass & Corwin, 1988). There were no effects in terms of discrimination ($p > .18$ for all). However, several bias effects emerged. First, the effect of prime type was significant $F(1,70) = 4.82$, $MSE = .11$, $p = .031$. Here, subjects were more conservative (greater bias) about claiming a target to be old when it was preceded by a repetition prime ($C = .35$, $SEM = .05$) than when it was preceded by an unrelated prime ($C = .26$, $SEM = .05$). The effect of truth was also significant $F(1,70) = 3.99$, $MSE = .09$, $p = .05$. Here, subjects were less conservative (lower bias) about claiming a target to be old when it was true ($C = .27$, $SEM = .05$) than when it was false ($C = .34$, $SEM = .04$). Finally, the interaction between prime type and prime placement was significant $F(1,70) = 5.76$, $MSE = .11$, $p = .019$. There were no other bias effects ($p > .08$ for all).

Further exploration of the Prime Type x Prime Placement interaction revealed that the effect of prime type was significant when the prime *followed* the trivia question $F(1,35) = 15.56$, $MSE = .08$, $p = .001$, but not when it preceded the trivia question, $F < 1.0$. Thus, when the prime followed the trivia question and matched the target, subjects were more conservative about claiming the target was old ($C = .44$, $SEM = .07$) than when the prime was unrelated to the target ($C = .26$, $SEM = .06$). When the prime preceded the trivia question and matched the target, subjects were neither more nor less likely to claim the target old ($C = .26$, $SEM = .08$) than when the prime was unrelated to the target ($C = .27$, $SEM = .07$, see Figure 1). In sum, the repetition and unrelated prime conditions did not differ in terms of discriminability, but they did differ in terms of bias.

These data replicate Jacoby and Whitehouse (1989), in which knowing that a repetition prime has been presented before the target word *reduces* recognition claims. This judgment reduction has been referred to as "overdiscounting" (Morris & Larrick, 1995), where failure to discount repetition-prime fluency results in *greater* recognition claims and correct discounting yields no repetition-prime effect. These data also place boundary constraints on repetition priming. First, repetition priming and its subsequent overdiscounting can still affect recognition claims when the prime appears in the context of a trivia question. Second, and more importantly, overdiscounting of repetition priming only occurs in this particular context when the prime follows the trivia question and immediately precedes the target. If the prime is obscured by the trivia question, there is no effect of repetition priming.

Experiment 2 was conducted to determine whether repetition priming affects belief judgments similarly to how it affects recognition judgments. The major question in Experiment 2 was whether a repetition prime

TABLE 2
Probability of Claiming True Based Upon the Truth and Oldness of the Target and the Type of Prime (Repetition or Unrelated) in Experiment 2

	True				False			
	Old		New		Old		New	
	Rep	Unrel	Rep	Unrel	Rep	Unrel	Rep	Unrel
Prime Before Q	.87	.85	.80	.78	.35	.26	.32	.26
SEM	.03	.02	.02	.02	.04	.03	.04	.04
Prime After Q	.84	.82	.82	.80	.34	.29	.31	.28
SEM	.03	.03	.03	.03	.04	.04	.03	.03

Note. Rep = repetition prime; Unrel = prime unrelated to target; Prime Before Q = Prime appeared before the trivia question; Prime After Q = Prime appeared after the trivia question; SEM = between-subjects standard error of the mean. The pooled within-subjects standard error for the Prime Before Q and Prime After Q conditions was 0.028 and 0.029, respectively.

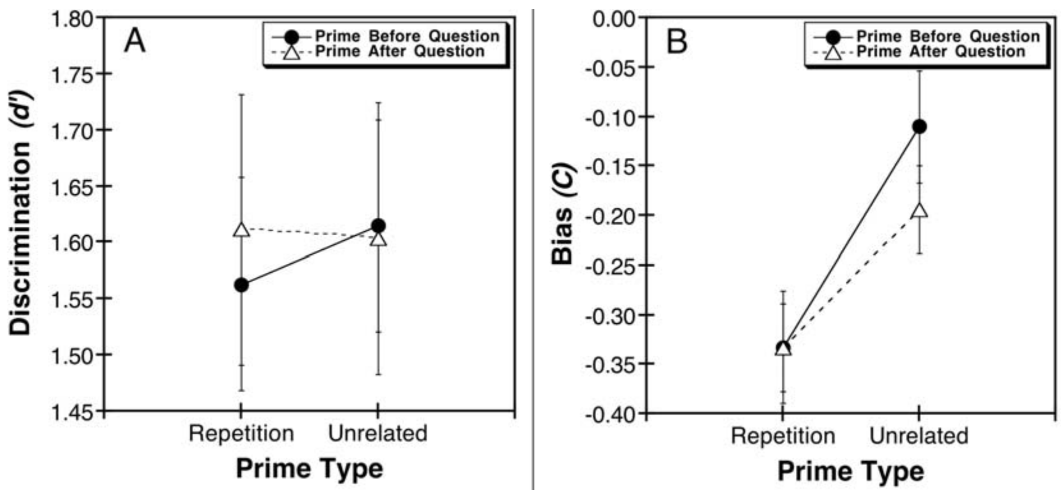

Figure 2. Discrimination (Panel A) and Bias (Panel B) as a function of whether the target answer was repetition primed or not, and whether the prime appeared before or after the question in Experiment 2. Error bars represent within-subject standard error of the mean (Loftus & Masson, 1994).

leads subjects to overdiscount, as observed in Experiment 1. The second question explored in Experiment 2 was whether the placement of a repetition prime would have any effect on truth judgments, as it had on recognition judgments in Experiment 1.

Experiment 2

Method

Subjects. Thirty-two Simon Fraser University students received course credit for their participation. Fifteen subjects received primes before the trivia question and 17 received primes after the trivia question

Procedure. The procedure was identical to Experiment 1, except that instead of deciding old or new, subjects decided whether the target was the correct or incorrect answer to the trivia question (True or False, respectively).

Results and Discussion

Table 2 lists the probability of claiming "true" for the different target types in Experiment 1. Analyses were conducted using discrimination (d') and bias (C) values as the dependent measures, and using prime type (repetition vs. unrelated) and oldness of target (old vs. new) as within-subject factors and prime placement as a between-subject factor. In terms of discrimination, only the effect of oldness of target was significant $F(1,30) = 6.22$, $MSE = .24$. Here, subjects were better able to discriminate between true and false target answers (higher discriminability) when the target was old ($d' = 1.70$, $SEM = .09$) than when the target was new ($d' = 1.49$, $SEM = .08$). There were no other effects in terms of discrimination ($p > .18$ for all). As in Experiment 1, both main effects of bias were significant. First, the effect of prime type was significant $F(1,30) = 14.50$, $MSE = .08$, $p = .001$. Here, subjects were

TABLE 3
Sources of Influence on Recognition and Belief in Experiments 1 and 2

	Recognition		Belief	
	Effect Size	95% CI	Effect Size	95% CI
Oldness of Target	.570 (.017)	.034	.031 (.012)	.024
Truth of Target	.014 (.007)	.014	.519 (.021)	.043
Prime Type	-.023 (.008)	.017	.038 (.013)	.027
Repetition Prime Placement	-.035 (.014)	.027	.022 (.020)	.041

Note. Effect Size represents the mean difference in probability of responding "old" or "true" for recognition (Experiment 1) and belief (Experiment 2), as a function of whether the target was old, true, and/or repetition primed. 95% CI represents the within-subject 95% confidence interval; within-subject standard error of the mean is shown in parentheses (Loftus & Masson, 1994). Oldness of target, truth of target, and prime type were calculated by collapsing across prime placement. Repetition prime placement was calculated as the difference in the size of the prime type effect when the prime preceded the question minus the condition when the prime followed the question. The standard error for repetition prime placement was calculated as: square root (pooled error / N), where pooled error is the sum of the sums of squares divided by the sum of the degrees of freedom associated with each of the error terms in a 2 x 2 x 2 within-subject experiment.

less conservative (lower bias) about claiming a target to be true when it was preceded by a repetition prime (C = -.32, SEM = .06) than when it was preceded by an unrelated prime (C = -.13, SEM = .04). The effect of oldness of target was also significant $F(1,30) = 7.48$, MSE = .09, p = .01. Here, subjects were less conservative (lower bias) about claiming a target to be true when it was old (C = -.30, SEM = .06) than when it was new (C = -.16, SEM = .04). There were no other bias effects ($p > .17$).

Despite the nonsignificant interaction in terms of bias between prime type and prime placement in Experiment 2, further analyses were conducted to determine the magnitude of the repetition priming effect as a function of prime placement. Unlike Experiment 1, the repetition priming effect was significant both when the prime followed the trivia question $F(1,16) = 6.58$, MSE = .06, p = .021, and when the prime preceded the trivia question $F(1,14) = 7.67$, MSE = .10, p = .015 (see Figure 2). In each case, repetition priming made subjects less conservative about claiming a target answer was true.

These results clearly show that repetition primes do not lead subjects to overdiscount, as observed in Experiment 1. Instead, repetition primes increase belief, a finding similar to the truth effect in which repeated statements are believed more than nonrepeated statements (e.g., Hasher et al., 1977). The present results extend the truth effect to the case where repetition of a single word, either before or after a trivia question, is sufficient to increase belief.

General Discussion

Two separate dissociations occurred in Experiments 1 and 2 involving repetition priming in the context of a trivia paradigm. First, repetition primes decreased recognition claims, but only when the prime followed the trivia question and immediately preceded the target (Experiment 1). Second, repetition primes increased truth claims (repetition truth effect) regardless of whether the prime appeared before or after the trivia question (Experiment 2). As both experiments demonstrate, these repetition-priming effects resulted from shifts in response bias rather than sensitivity. Thus, repetition primes changed the *manner* in which subjects made recognition and belief judgments, rather than the accuracy of these memory judgments.

Table 3 lists four different sources of influence that contributed to performance in Experiments 1 and 2. Remembering and believing were both positively and similarly affected by the oldness of the target and the truth of the target. For example, in recognition, true target answers to trivia questions produced greater claims of old ("fastest animal – cheetah") than did false answers ("leopard"). Similarly, in belief, old target answers that had been studied previously were more likely to be claimed true than new answers (see Kelley & Lindsay, 1993; Lindsay & Kelley, 1996). For instance, subjects who studied the word, "cheetah," were more likely to believe that cheetah was the fastest animal than were those who did not study "cheetah." In each case, the truth of a target answer or prior exposure likely increased the fluency with which subjects processed those words, which, in turn, subjects misattributed to prior exposure or truth, respectively.

In other work, we have shown that unscrambling an anagram within a life event (e.g., "broke a dwniwo playing ball") or unscrambling the answer to a trivia question (e.g., "fastest animal – elpraod") increased subjects' claims that the event occurred in their childhood and that the target answer was true (Bernstein, Godfrey, Davison, & Loftus, 2004; Bernstein, Whittlesea, & Loftus, 2002). More recently, we have shown that unscrambling a word prior to seeing a brand name increased subjects' claims that they had studied the brand name and increased their preference ratings for the brand name (Kronlund & Bernstein, 2004). Our previous results with autobiographical memory, trivia, and brand-name preference, and the present study's results with oldness of target and truth of target indicate that, under some circumstances, remembering and believing are similarly affected by the same processing manipulations. However, Table 3 also shows two different processing manipulations (prime type and repetition prime placement) that differentially affect remembering and believing.

The present findings can be understood by closely examining the processing requirements of a given set of tasks and the subjects' understanding of those requirements. According to Marcel (1983), people attempt to "make sense of as much data as possible at the most functionally useful level" (p. 238). In so doing, people develop intuitive theories about how particular prior experiences or general knowledge should affect performance. This use of intuitive theories fits nicely into what Koriat, Goldsmith, and Pansky (2000) refer to as "the personal and social goals of the rememberer" (p. 523).

In the present work, subjects train on words (e.g., "cheetah") and later see those words and novel words in the context of trivia questions. Additionally, target answers are sometimes repetition primed (e.g., "fastest animal – cheetah – cheetah"). In such cases, the target answer ("cheetah") will be processed fluently (see Versace & Nevers, 2003). The subjects' task is to disambiguate potential sources of processing fluency to determine whether a particular item was old or new, or true or false (cf. Johnson, Hashtroudi, & Lindsay, 1993).

So, why then does obvious repetition increase belief in a target answer while it decreases recognition claims? The way in which subjects regard repetition primes depends on the type of task involved and the subjects' understanding of the task (cf. Roediger, Neely, & Blaxton, 1983; McCloskey & Glucksberg, 1979). The subjects' understanding of the task largely determines how and when they will discount sources of processing fluency. According to this account, the placement of a repetition prime will influence recognition and belief differently, depending on the particular way in which subjects construe the task (cf. Marcel, 1983). Thus, in making sense of the task, subjects are making sense of memory.

In the belief task, repetition prime placement has little effect because subjects realize that what is paramount is the relationship between the prime and the question rather than the relationship between the prime and the answer. The converse occurs in recognition, where subjects try to ignore the question to determine if and, more importantly, when a target word was shown previously in the experiment. Although people may see recognition and belief as different tasks, these are attributions that people make about their processing experience (Whittlesea, 1997, 2004).

Another way in which the two dissociations in Experiments 1 and 2 may be understood is as follows. In both experiments, subjects begin their recognition or belief judgment as soon as they see the prime. When the target appears and is repetition primed, subjects search memory for a reasonable source to explain the fluency caused by the prime. They terminate their search as soon as they locate a viable and salient source.

In Experiment 1 (recognition), when the prime follows the trivia question, subjects have little time to reflect on the prime as old or new before they see the target. When the target appears and is repetition primed, it is fluently processed. However, because subjects have not had adequate time to determine the prime's status as old or new, they are heavily influenced by the fluency with which they process the target. In turn, they ascribe the fluency to the most salient source – the prime – thereby overdiscounting, calling repetition primed words "new." When the prime precedes the trivia question, subjects have more time to reflect on whether it is old or new before seeing the target answer. When the target appears and is repetition primed, it is fluently processed, as previously described. However, now the prime has been obscured by the trivia question, rendering the prime less salient as a source to explain the fluency. The obscuring of fluency's source, I contend, leads subjects to attribute some of the fluency to the question and some to the prime. This process, coupled with the extra time subjects have had to ponder the prime's status, enables subjects to successfully discount (without overdiscounting) the effect of the prime, resulting in a null effect. In future work, this idea could be tested directly by manipulating the time that subjects spend thinking about the prime.

In Experiment 2 (belief), when the prime follows the trivia question, subjects have had some time to consider various answers to the question before the prime appears. However, as soon as the prime appears, the search for possible answers is interrupted. If subjects have not produced a viable alternative answer to the one that was repetition primed, they will likely accept the primed (i.e., fluently processed) answer as true (see Begg et al., 1992). Even if they have produced a viable alternative, the fluency resulting from the repetition-primed answer may cause them to doubt their original answer. When the repetition prime precedes the question, subjects may simply "go along" with the first answer in mind: the repetition prime (note that all target answers are plausible in this paradigm). In both cases, repetition primes constrain the number of alternative answers that subjects can generate by providing subjects with a likely candidate answer to the question (akin to the availability heuristic, see Tversky & Kahneman, 1973). Thus, having a plausible answer in mind interferes with the search for and production of alternative answers. Future work should explore the mechanism underlying the two dissociations between memory and belief observed here.

Conclusion

The way in which repetition priming influences recognition or belief depends upon the processing demands of the task and one's interpretation of those demands. Obvious repetition priming decreases recognition and increases belief. Under certain circumstances, it is possible to reverse these effects (see Bernstein, 2002). The present methodology and data are consistent with the notion that dissociations in memory performance are a natural outcome of task and processing demands rather than the result of memory's intrinsic structure (cf. Kinder & Shanks, 2003; Van Orden, Pennington, & Stone, 2001). As such, dissociations in memory performance reflect the dynamic and flexible nature of memory.

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