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Putting congeniality effects into context: Investigating the role of context in attitude memory using multiple paradigms

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Abstract

In three experiments, we evaluated remembering and intentional forgetting of attitude statements that were either congruent or incongruent with participants' own political attitudes. In Experiment 1, significant directed forgetting was obtained for incongruent statements, but not for congruent statements. In addition, in the remember group, recall was better for incongruent statements than congruent statements. To explain these findings, we propose a *contextual competition at retrieval hypothesis*, according to which incongruent statements become more strongly associated with their episodic context during encoding than do congruent statements. At the time of retrieval, incongruent statements compete with congruent statements due to the greater amount of contextual information stored in their memory trace. We tested this hypothesis in Experiment 2 by studying free recall of congruent and incongruent statements in a mixed-pure list design. In Experiment 3, memory for incongruent and congruent statements was tested under recognition test conditions that varied in terms of how much direct retrieval of contextual details they required. Overall, the results supported the contextual competition hypothesis, and they indicate the importance of context strength in both the remembering and intentional forgetting of attitude information.

Keywords

directed forgetting; attitude memory; context strength; congeniality effect

Imagine that you are following a political candidate who you think has been impressive in a current campaign. You have listened to this candidate speak, and are well-informed about this individual's views on important political issues. Unfortunately, you later learn of a scandal that this candidate was involved in, and you decide that you no longer want to vote for this candidate. Furthermore, you feel that you should attempt to forget all the information you have learned about this candidate not only because it is no longer relevant, but also because it could help you better learn the views of other candidates who are still contending for your vote. In situations like this, motivated forgetting of unwanted

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information could serve an adaptive role by allowing for the formation of more accurate impressions about other candidates.

In this paper, we investigated whether people's pre-existing attitudes influence what they later intentionally forget from presented information – that is, are they more likely to forget information that is congruent with their attitudes? Are they more likely to forget information that is incongruent with their attitudes? In addition to intentional forgetting, we also examined whether people are more likely to remember attitude-congruent or attitude-incongruent information when the goal is to maintain that information in memory rather than to discard it from memory. The directed forgetting paradigm, which is described in the next section, provides an excellent opportunity to investigate both of these questions simultaneously.

Directed Forgetting Procedure, Basic Findings, and Mechanisms

In the laboratory, intentional forgetting has often been studied using the directed forgetting procedure (e.g., Bjork, LaBerge, and LeGrand, 1968). In this paper, we have used list-method directed forgetting, which involves presenting participants two lists of items to learn for a later memory test. Following presentation of List 1, participants are given a cue to either forget or to remember all List 1 items. Participants in the remember group are informed that List 1 contained only the first half of items they will need to remember later, while participants in the forget group are informed that they will not be tested on the List 1 items later, and therefore should forget them. All participants then study a second list of items, after which they are asked to recall items from both lists.

Typically, such procedures lead to robust memory impairment of List 1 items by the forget group compared to the remember group – known as the *costs* of directed forgetting. In addition, List 2 items are sometimes better remembered by the forget group than the remember group – known as the *benefits* of directed forgetting (for reviews, see Bäuml, 2008; Johnson, 1994; MacLeod, 1998). The benefits appear to be less robust and are not always observed together with the costs (e.g., Conway, Harries, Noyes, Racsmány, & Frankish, 2000; Pastötter & Bäuml, 2010; Sahakyan, Delaney, & Goodmon, 2008; Sahakyan, Delaney, & Kelley, 2004; Whetstone, Cross, & Whetstone, 1996; Zellner & Bäuml, 2006).

Early explanations of directed forgetting proposed an inhibitory account whereby the forget cue produces the costs by inhibiting List 1 items; consequently, the inhibited List 1 items produce less interference on List 2, leading to the benefits (e.g., Bjork, 1989; Bjork & Bjork, 1996; Geiselman, Bjork, & Fishman, 1983). However, recently, the contextual explanation has become more popular. According to this account, directed forgetting arises from a mismatch between the retrieval context and the encoding context of List 1 items (Lehman & Malmberg, 2009; Sahakyan & Kelley, 2002; Spillers & Unsworth, 2011). Specifically, according to Sahakyan and Kelley (2002), the forget cue motivates participants to shift their mental context between the lists by engaging in thoughts unrelated to the experiment. During the test, the retrieval context better matches the encoding context of List 2 than List 1, causing impaired recall of List 1 items. The benefits occur because of reduced interference, which arises as a consequence of encoding the lists with different contextual cues. The contextual account brings directed forgetting into the family of effects that are modeled by contextual mechanisms in global memory models like SAM and REM (Lehman & Malmberg, 2009; Lehman & Malmber, 2011).

In response to dissociations between the costs and the benefits of directed forgetting, two-factor accounts have also been proposed. These accounts attribute List 1 costs to either

inhibition or context change, and they explain List 2 benefits by an improvement in List 2 encoding that occurs either as a result of adopting better study strategies during List 2 learning (Sahakyan & Delaney, 2003; 2005) or due to a reset of encoding processes during List 2 (Bäuml, Hanslmayr, Pastötter, & Klimesch, 2008; Pastötter & Bäuml, 2010).

Directed forgetting has been examined with a variety of stimuli including letters (Muther, 1965), unrelated words (for a review, see MacLeod, 1998), emotional words (e.g., Wessel & Merckelbach, 2006), stereotypic trait words (e.g., Macrae, Bodenhausen, Milne, & Ford, 1997), pictures (e.g., Basden & Basden, 1996;), sentences (e.g., Geiselman, 1974), motor actions (e.g., Burwitz, 1974), behavioral descriptions given during an impression formation task (e.g., Golding, Fowler, Long, & Latta, 1990), and autobiographical memories (e.g., Joslyn & Oakes, 2005). While a wealth of studies have demonstrated that people are capable of controlling their own forgetting by reducing the accessibility of unwanted information, there is virtually no research examining whether people's preexisting attitudes influence what type of information they are likely to intentionally forget. For instance, after hearing a debate, one may decide that they do not want to vote for either the candidate that represented their own party or the candidate representing the opposing party. In this instance, will the voters be able to successfully forget the information they learned about both candidates? Or instead, will their political attitudes influence which candidate's views they are able to successfully forget? In other words, are they more likely to forget information that is consistent or inconsistent with their existing views? The current research aims to answer these questions.

Although two prior studies examined directed forgetting of stereotypic trait words (e.g., Araya, Akrami, & Ekehammar, 2003; Macrae et al., 1997), they do not address how preexisting attitudes affect directed forgetting because research on stereotype memory typically investigates effects associated with the *expectancy* of stereotype information rather than preexisting attitudes (for a review, see Rojahn & Pettigrew, 1992; Stangor & McMillan 1992). For example, both Araya et al. (2003) and Macrae et al. (1997) implicitly primed a specific stereotype category prior to the presentation of the stereotypic trait words, and then examined whether directed forgetting varied for stereotype-congruent versus incongruent trait words. Overall, participants in both experiments were able to forget words that were related to the primed stereotype, however, neither of these studies investigated whether participants actually held the relevant stereotypic beliefs, and if so, how those attitudes affected the magnitude of directed forgetting. Therefore, these studies remain silent about the relationship between pre-existing attitudes and directed forgetting. Our goal was to investigate the effects of explicit attitudes on directed forgetting by presenting participants with various statements that were either consistent or inconsistent with their political party attitudes.

Research on memory for attitudes has focused on how attitudes affect memory when the goal is to remember (rather than forget such information). The earliest work often found improved memory for information that was consistent or congruent with one's own beliefs – known as the *congeniality effect* (e.g. Levine & Murphy, 1943). However, numerous studies since then have produced either null congeniality effects (e.g. Eagly, Kulesa, Brannon, Shaw, & Hutson-Comeaux, 2000; Greenwald & Sakumura, 1967), or even anti-congeniality effects, with enhanced memory for attitude incongruent rather than congruent information (e.g. Cacioppo & Petty, 1979). A meta-analysis investigating memory for attitude information confirmed that the congeniality effect is highly inconsistent and the reasons for the discrepant findings are not fully understood (Eagly, Chen, Chaiken, & Shaw-Barnes, 1999).

Current Experiments

We conducted three experiments aimed to examine the processes involved in both remembering and intentional forgetting of complex, self-related attitudes by employing political statements that were either congruent or incongruent with participants' own political party identity. The choice of this type of stimuli was motivated by the fact that people typically hold pre-existing attitudes regarding the selected issues, and because they allow for selection of groups with divergent views on these issues (Republicans vs. Democrats). Recruitment of participants with divergent views makes it possible to manipulate the study materials to be either congruent or incongruent with their existing beliefs.

In Experiment 1, we used a list-method directed forgetting paradigm, where participants studied a mixture of statements that were either congruent or incongruent with their pre-existing party attitudes. To preview the results, we found better recall for incongruent than congruent statements in the remember group (i.e., an anti-congeniality effect), and also greater directed forgetting for incongruent than congruent statements in the forget group. To explain the overall pattern of findings across the remember and forget groups, we proposed that during encoding, incongruent statements become more strongly associated with their episodic context than do congruent statements, which produces their advantage in the remember group, along with their disadvantage in the forget group. The next two experiments were designed to test this hypothesis by using different memory paradigms that are used to examine context effects.

Previous research has established that episodic context strength has unique effects in free recall and recognition under different experimental conditions. For instance, while items more strongly associated with their episodic context have a free recall advantage over items with weaker episodic context when both types of items are studied on a mixed list, this advantage is diminished when each type of item is studied separately on pure lists (e.g. Malmberg & Shiffrin, 2005). Furthermore, although context strength plays a lesser role in yes/no recognition than in free recall, context effects do emerge in the recollection component of recognition and are thus observed when the test is made more difficult by increasing the similarity between target items and distracters (e.g. Hintzman & Curran, 1994). Therefore, to further test the hypothesis that incongruent items are associated with more episodic context than are congruent items, in Experiment 2 we used a pure-mixed list free recall paradigm, and in Experiment 3 we manipulated the similarity of targets and distractors in a yes/no recognition paradigm (there was no directed forgetting manipulation in either of those experiments).

Experiment 1

The purpose of Experiment 1 was to examine directed forgetting of attitude statements that were either congruent or incongruent with participants' pre-existing attitudes. To investigate this issue, a combination of liberally and conservatively phrased attitude statements concerning a variety of political issues were presented to Democrat and Republican participants in a list-method directed forgetting design. Because the control condition of the list-method directed forgetting paradigm involves presentation of a standard "remember" instruction, use of this paradigm also allows for the examination of attitude statement memory when the goal is to remember rather than intentionally forget such information Therefore, examination of memory for congruent and incongruent statements in the Remember group can address how attitude congruency influences the remembering of such information, whereas the examination of the same information in the Forget group can address how attitude congruency affects intentional forgetting.

Method

Participants—The participants were 64 UNCG undergraduates who participated for course credit. Prior to testing, one half of the participants identified themselves as Democrats and one half identified as Republicans. The two groups of participants were recruited through an online scheduling system, which specified that to be eligible to participate in the study, participants must identify themselves as Democrats (in one condition), and as Republicans (in another condition). When they arrived, they were randomly assigned to the remember or the forget groups.

Materials—A pool of statements reflecting political attitudes was created according to the following procedure. A group of 44 undergraduate psychology students were presented with 16 different political issues (e.g., taxes, healthcare, immigration, same-sex marriage, etc.), and were asked to create two statements concerning each of the issues. They were instructed to write one statement they thought was representative of a typical Republican viewpoint as well as one statement that they thought was reflective of a typical Democratic viewpoint for each issue. The experimenters subsequently chose one conservative statement (e.g. "Healthcare in the U.S. should remain privatized.") and one liberal statement (e.g. "There should be universal healthcare in the U.S.") for each of the 16 issues based on the most frequently produced Republican and Democrat viewpoint for each topic. Thus, the pool of stimuli was comprised of 16 liberally phrased statements, and 16 conservatively phrased statements, with two different versions per topic.

To further ensure that the statements would be perceived as representative of the two political party ideologies, pre-testing was conducted. Seventy-eight undergraduate psychology students who had no prior familiarity with the items were asked to rate eight conservatively-phrased and eight liberally-phrased statements on 16 different topics. Counterbalancing ensured that one half of the participants rated the liberal version of each statement, and the remaining half rated the conservative version. Participants were told to use a scale from 1 to 7, where a rating of 1 was to be given to statements that they thought reflected the most liberal attitudes, and a rating of 7 was to be given to those statements that they thought reflected the most conservative attitudes. Pre-testing results confirmed that conservative statements were rated significantly higher than the liberal statements, $t(77)=15.16$, $p<.001$, implying that the pool of statements reflected the opposing attitudes of the two parties.

The topics (e.g., taxes, healthcare, immigration, etc.) were randomly split to create two lists that were each 8 statements in length. The order of the lists was counterbalanced so that each topic statement was assigned equally often to the first and the second study list. Half of the topic statements within each list were phrased in a liberal way, whereas the remaining topic statements were phrased in a conservative way. The phrasing of the statements was also counterbalanced throughout the experiment such that some participants studied the liberal version and other participants studied the conservative version of the same topic.

Design—This study employed a mixed factorial design, with *Cue* (forget vs. remember) and *Party Identity* (Republican vs. Democrat) as the between-subjects factors, and *Statement Type* (congruent vs. incongruent) as the within-subjects factor. When the party identity of the participants coincided with the phrasing of the statements that they studied, we termed this condition *congruent* (i.e., conservative statements studied by Republicans and liberal statements studied by Democrats); whenever they were opposite, we termed this condition *incongruent* (i.e., liberal statements studied by Republicans, and conservative statements studied by Democrats). Initial analyses in all experiments included *party identity* (Republican vs. Democrat) as a factor. However, because it produced neither main effects

nor interactions in any of the experiments, we have streamlined the presentation of results by collapsing across party identity throughout the experiments.

Procedure—Prior to list presentation, participants were informed that they should memorize the presented statements. To ensure adequate encoding, they were told to rate each statement using the same scale from the pre-testing, where a rating of 1 was to be given to statements that they thought reflected the most liberal attitudes, and a rating of 7 was to be given to those statements that they thought reflected the most conservative attitudes.

The statements were presented on a computer screen at a rate of 12 s per statement in random order. List 1 presentation was followed by either a forget or a remember cue, which was verbally presented by the experimenter. Participants receiving the forget cue were informed that List 1 presentation was "just for practice." They were told to try and forget those statements because they would not be tested on them. The remember cue specified that the statements presented on List 1 were just the first half of items that were to be remembered for a later memory test. Following the mid-list cue, all participants were presented with List 2 statements, which they again encoded using the same rating procedure used during List 1. After studying List 2, participants were first given 3 minutes to recall List 1 statements, followed by an additional 3 minutes to recall List 2 statements. Because recall of List 1 came as a surprise to the forget group participants, the experimenter referred to it as the "practice list" rather than List 1 to avoid potential confusion as to which list they were supposed to recall. Recall was carried out on separate sheets of paper. Participants were informed that they should attempt to recall the statements as closely as possible to the way they were presented, but that if they could not recall verbatim, they could paraphrase them.

Scoring—A statement was considered to be correctly recalled when the conveyed attitude of the statement was preserved. In other words, a recalled statement was only counted as correct if both the main topic and correct valence (i.e. liberal or conservative stance) were recalled. For instance, for the original statement "There should be universal healthcare in the U.S.," recalling "All Americans should be provided with healthcare," was scored as correct. The conveyed attitude of the presented statements was preserved for the vast majority of the recalled statements. Two independent raters scored each participant's statement recall. Inter-rater reliability was 97%, and discrepancies were resolved through discussion.

On rare occasions, participants recalled the statements in the attitude-reversed form (e.g., "Healthcare in the U.S. should remain privatized") or recalled only the main topic (e.g., "Healthcare"). Such errors were infrequent and were not counted toward correct recall. On average, participants recalled 1.6% of the studied statements in the attitude-reversed form, and 2.3% of the statements were recalled using only the main topic.

Results

Congeniality Findings in the Remember group—First, we examined the recall of congruent and incongruent statements in the Remember group to determine if memory was influenced by attitudes when the participants' goal was to remember. A repeated-measures ANOVA, using *statement type* (congruent vs. incongruent) and *study list* (1 vs. 2) as factors revealed a significant main effect of statement type, $F(1,31)=8.72$, $MSe=.051$, $p<.01$, indicating better recall for incongruent ($M=.52$, $SD=.17$) than congruent statements ($M=.42$, $SD=.15$). This recall advantage for incongruent statements emerged equally across both study lists as there was no interaction with the study list, $F(1,31)=1.16$, $p=.29$. There was also a marginally significant effect of study list, $F(1,31)=3.99$, $p=.06$, indicating better recall for the second list ($M=.51$, $SD=.17$) than the first list ($M=.43$, $SD=.18$). Overall, this

analysis suggests that when the goal was to remember, there was a significant anti-congeniality effect favoring recall of incongruent statements. Next we examine how attitude congruency influenced directed forgetting.

Directed Forgetting Findings—To evaluate the costs of directed forgetting, a mixed-factorial ANOVA was conducted on the proportion of List 1 recall using *cue* (forget vs. remember) and *statement type* (congruent vs. incongruent). There was neither a main effect of cue ($F<1$), nor a main effect of statement type, $F(1,62) = 1.18$, $p=.28$. However, there was a significant interaction, $F(1,62)=6.10$, $MSe=.05$, $p<.05$, $\eta^2 = .09$ (see Figure 1). Follow-up tests indicated that participants in the forget condition recalled significantly fewer incongruent statements than participants in the remember group, $t(62)=2.27$ $p<.05$. However, there was no significant difference in the recall of congruent statements between the remember group and the forget group, $t<1$. In other words, incongruent statements showed the costs of directed forgetting, whereas the congruent statements did not. To evaluate the benefits of directed forgetting, the same analysis was also conducted on the proportion of List 2 recall. The results are summarized in Table 1. This analysis revealed neither a significant main effect of statement type ($F<1$), nor a significant main effect of cue, $F(1,62)=1.17$, $p=.28$, nor an interaction, $F<1$. Overall, we did not observe the benefits of directed forgetting for either type of statement.

Discussion

We observed a significant anti-congeniality effect in the remember group. Memory was better for incongruent statements than congruent statements when the goal was to remember. Interestingly, when the goal was to forget, incongruent statements showed robust directed forgetting costs, whereas the congruent statements did not. In other words, participants successfully forgot the statements that were representative of views of the opposing party, but they did not forget the statements that expressed the views of their own party. We did not observe directed forgetting benefits in this experiment, and we defer further discussion of this issue until the General Discussion.

To explain these results, we entertain two broad hypotheses – the *depth of encoding* hypothesis and the *contextual competition at retrieval* hypothesis. It could be that incongruent items were better recalled than congruent items in the remember group due to greater elaboration during encoding. For example, in the context of congruent statements, the incongruent statements may have attracted greater attention and received more elaborate encoding. One such elaborate encoding strategy might involve counter-arguing. Specifically, Eagly et al. (2000) proposed that when challenged with conflicting information, people attempt to defend their attitudes by engaging in counter-argumentation. Thus, incongruent items may have become more elaborately encoded (e.g., due to counter-arguing), and this may have produced the pattern of recall observed in the remember group.

Although the depth of encoding hypothesis could account for the findings in the remember group, it cannot easily accommodate the directed forgetting findings. We obtained greater directed forgetting of incongruent statements than congruent statement, and therefore the encoding hypothesis would have to make a counter-intuitive assumption that more elaborately encoded items are easier to intentionally forget than are less elaborately encoded items. Previous research casts doubt on this assumption. Particularly, Sahakyan, Delaney, and Waldum (2008) showed that depth of encoding manipulations produce equivalent directed forgetting across more elaborately encoded and less elaborately encoded items, despite producing overall differences in recall. These findings suggest that it is unlikely that the current results were driven by encoding differences across incongruent and congruent

items. Particularly, because the directed forgetting findings are inconsistent with a depth of encoding account, they constrain the possible interpretations.

Given that the depth of encoding hypothesis cannot explain the overall pattern of results, we propose an alternative hypothesis that attributes the forget and remember group findings to a single mechanism, episodic context strength. According to many formal theories of memory, encoding of an item creates a memory trace that contains not only the meaning of the item (termed the item information) but also contextual information, which can include spatial–temporal, environmental, physiological, or emotional information present during learning. Contextual information plays a critical role in free recall because when people initially search their memory, they rely on contextual cues to guide retrieval (e.g., Anderson & Bower, 1972; Howard & Kahana, 2002; Gillund & Shiffrin, 1984; Lehman & Malmberg, 2009). Items that contain more contextual information in their memory trace come to mind more easily, and thus are recalled to a greater extent than items that contain weaker contextual information (e.g., Malmberg & Shiffrin, 2005). In other words, a contextual competition determines which items are retrieved from memory during free recall, and items that are associated with more contextual information have a distinct advantage in this competition. We propose that during encoding, incongruent statements accumulate a greater amount of episodic contextual information in their memory trace than do congruent statements. As a result, incongruent statements have a recall advantage over congruent statements in the remember group, which explains the anti-congeniality effect observed in the remember group.

According to global memory models, retrieval success depends on the overlap between the context that was present at the time of storage and the context present during test (e.g., Gillund & Shiffrin, 1984; Shiffrin & Steyvers, 1997). Because the context change account of directed forgetting was built upon the assumptions of these global memory models, it asserts that directed forgetting emerges as a result of a rapid change in mental context that occurs between the two lists. At the time of test, context cues better match the context of List 2 encoding than List 1 encoding, resulting in directed forgetting impairment. The contextual account of directed forgetting also predicts that items that are more strongly associated with List 1 context should suffer more when context changes at the time of test (as in the directed forgetting condition) than items that are weakly associated with the study context. Indeed, in prior research, Sahakyan, Delaney, and Waldum (2008) demonstrated that items that contain greater amounts of context in their memory trace (such as spaced items, [Malmberg & Shiffrin, 2005]), produce greater directed forgetting. Extrapolating from prior research, we propose that if incongruent statements contain more episodic context in their memory trace than congruent statements, this could explain why they suffer more from the directed forgetting manipulation.

To summarize, a greater amount of episodic context stored in the memory trace of incongruent items can explain both their recall advantage when the goal is to remember, and it can also explain why they show greater directed forgetting when the goal is to forget. We refer to this as the c*ontextual competition at retrieval hypothesis*.

Experiment 2

To investigate the contextual competition at retrieval hypothesis, we implemented an LSE design, which involves comparing recall for the same types of items across pure lists and mixed lists (e.g., Malmberg & Shiffrin, 2005; Ratcliff, Clark, & Shiffrin, 1990; Tulving & Hasty, 1972). An LSE is said to emerge when a recall difference between strong and weak items observed on a mixed list is significantly reduced when the same items are presented on pure lists. This pattern emerges because strong items from mixed lists are better recalled

than strong items from pure lists, and weak items from mixed lists are recalled more poorly than weak items from pure lists.

The LSE paradigm can be used to directly test the contextual competition hypothesis because the LSE pattern only emerges when retrieval competition occurs between memory traces that contain strong contextual information and those that contain relatively weaker contextual information (Malmberg & Shiffrin, 2005). Specifically, on mixed lists, items with a greater amount of context in their memory trace are more strongly activated and are sampled preferentially over items with weaker context. In contrast, on pure lists, the context strength across all items on a list is equated, making the probability of sampling any pure list item equivalent to the probability of sampling any other pure list item. Because there is no sampling advantage on pure lists, the difference in recall between items with more versus less contextual information is diminished.

Research indicates that an LSE does *not* emerge when items are strengthened by depth of encoding manipulations, because such manipulations do not affect context strength (Malmberg & Shiffrin, 2005). Therefore, if incongruent statements accumulate greater contextual information in their memory trace than do congruent statements, we would expect to observe an LSE pattern in the current experiment. On the other hand, if our effects were driven by depth of encoding factors such as greater attention and more elaborate encoding of incongruent items, then we would not expect to observe a LSE (Malmberg & Shiffrin, 2005). To test these predictions, participants studied and recalled either a pure congruent list, a pure incongruent list, or a mixed list containing both types of statements for a later memory test (there was no directed forgetting manipulation in this experiment).

Method

Participants—The participants were 72 UNCG undergraduates who participated for course credit. None of them had participated in the previous experiment. Prior to testing, half of the participants identified themselves as Republicans, and half identified themselves as Democrats. They were recruited though the online scheduling system described in the previous experiment.

The Mehrabian (1996) Liberalism-Conservatism scale was also used in this experiment as an independent measure of participants' political identity. Scores on this scale validated participants' self reports of political party identity. The scores obtained from self-reported Democrats (M= −6.00, SD=4.63) were significantly lower than the scores obtained from self-reported Republicans (M=11.68, SD=6.66), $t(70)=13.00$, $p<.001$.

Materials—The materials were the same as in Experiment 1. One study list was created for each participant. This list was comprised either entirely of statements that were congruent with the participants' own political party (pure congruent), entirely of statements that were incongruent with the participants' own political party (pure incongruent), or was comprised of a mixture of congruent and incongruent statements (mixed). Counterbalancing ensured that all topics were assigned equally often to the three list types. Pure lists contained eight liberal statements, or eight conservative statements on different topics. The mixed lists contained blocked presentations of four liberal and four conservative statements on different topics. The blocked presentation style is commonly used in LSE paradigms to minimize rehearsal redistribution (e.g., Toppino & Schneider, 1999). The presentation order of the blocks within the mixed list was counterbalanced. Finally, the presentation order of statements within each block on the mixed lists, as well as within each pure list was randomized for each participant.

Design—This study employed a pure factorial design, with *List Type* (pure vs. mixed), *Party Identity* (Republican vs. Democrat) and *Statement Type* (congruent vs. incongruent) all varied between subjects.

Procedure—Participants studied and recalled statements from a single list that was either a pure congruent list, a pure incongruent list, or a mixed list. Prior to the study session, participants were informed that they should memorize the presented statements, and were given instructions for the same liberal-conservative orienting task that was used in Experiment 1. All statements were presented on a computer screen at a rate of 12 s per statement in random order. Following list presentation, participants were given 3 min to recall the statements. The recall instructions given to participants were similar to Experiment 1. Following recall, participants completed the Mehrabian (1996) Liberalism-Conservatism scale.

Results

Recall was scored using the same criterion described earlier. The results are displayed in Figure 2. Two independent raters scored each participant's statement recall. Inter-rater reliability was 96%, and discrepancies were resolved through discussion.

Erlebacher's (1977, 1978) procedure was designed to contrast within and between subjects effects and is often used in the pure-mixed list memory literature (McDaniel, Cahill, Bugg & Meadow, in press; McDaniel & Einstein, 1986,). Therefore, this technique was employed to conduct an ANOVA using list type (pure vs. mixed) and congruency (congruent vs. incongruent). This analysis revealed that while there was neither a main effect of congruency $F(1,52) = 1.42$, $p = .24$ nor of list type $F < 1$, there was a significant congruency by list type interaction $F(1,52) = 5.87$, $p < .05$. Planned comparisons revealed that while recall of congruent and incongruent statements did not differ on pure lists, $t < 1$, there was a significant recall advantage for incongruent statements over congruent statements on a mixed list, $t(22)=2.34$, $p<.05$. The incongruent statements were recalled better when they were on the mixed lists than when they were on the pure lists, $t(46)=2.04$, $p<.05$. In contrast, the opposite pattern was present for the congruent statements, with a numerical (though not statistically significant) recall advantage on pure lists over mixed lists, $t(45)=1.54$, $p=.13$. The strengthening component of the LSE is typically more robust than the weakening component (e.g., Malmberg & Shiffrin, 2005; Ratcliff et al., 1990), and this pattern also emerged in the current study.

Discussion

The results of Experiment 2 reveal an anti-congeniality effect on mixed lists and a null-congeniality effect on pure lists. Furthermore, incongruent items benefited from being on a mixed list compared to a pure list, whereas congruent items suffered on the mixed list relative to the pure list. This pattern is indicative of an LSE, and it is predicted by our proposed contextual competition hypothesis. However, the observed pattern might also be consistent with an alternative interpretation proposed by McDaniel and Bugg (2008), who attempted to explain why many memory effects are observed on mixed lists but not on pure lists. Their framework stresses that the amount of serial order information that is associated with unusual/distinctive items and common items is affected by list composition, and that differences in serial order encoding of these items across list type underlies many pure-mixed list memory effects (e.g., Nairne, Riegler, & Serra, 1991; Serra & Nairne, 1993). Thus, in our current experiment, the amount of order information associated with congruent and incongruent statements might have changed across pure and mixed lists, leading to the pattern of LSE-like recall. Namely, according to McDaniel and Bugg's (2008) framework, recall of incongruent items may have increased from the pure to the mixed list because an

increased amount of order information was encoded with these items when they were studied on a mixed list. Conversely, congruent items may have suffered on the mixed list relative to the pure list because the order information encoded with these items decreased on the mixed list relative to the pure list. We tested this alternative interpretation of our data using Asch and Ebenholtz's (1962) input-output order correspondence measure, which is often employed to test McDaniel and Bugg's (2008) framework (e.g. McDaniel et al. in press).

Input-output scores represent the proportion of adjacently recalled pairs that maintain the same order in which they were input. For instance, if items 1, 2, 3, 4 are studied and then output in the order of 2, 4, 3, 1, the input-output score is .33. This is because only one pair (2,4) of the three recalled pairs (2, 4; 4, 3; 3, 1) was recalled in the same order in which it was studied. An input-output correspondence score of .50 represents chance, while a score of 1.0 represents prefect preservation of input order during recall.

Input-output scores were not calculated for nine participants who recalled one or fewer statements. Additionally, we were unable to compute this measure for an additional 10 participants (5 pure incongruent, 3 pure congruent, 2 mixed) for whom the data files indicating input order were lost due to a computer software malfunction. Asch and Ebenholtz's (1962) procedure limits input-output scores to one measure per list. Therefore, only one score was calculated for participants who studied a mixed list of congruent and incongruent statements. However, McDaniel and Bugg's (2008) framework assumes that order information is equated for distinct and common items on mixed lists, therefore, one value is sufficient to represent the order information associated with both types of items. The order-based interpretation of our data would predict that input-output correspondence would be the highest on the pure congruent list, intermediate on the mixed list, and lowest on the pure incongruent list. An ANOVA conducted on input-output scores using list type (pure incongruent vs. pure congruent vs. mixed) indicated that there was no difference in input-output correspondence between any of the list types, $F<1$. In fact, input-output correspondence did not differ significantly from chance for pure congruent ($M = .55$, $SD = .25$), pure incongruent ($M = .51$, $SD = .32$), or mixed lists ($M = .49$, $SD = .26$) (all t's <1).

Overall, the emergence of an LSE with no indication of differential order information associated with congruent and incongruent items across lists favors our proposed contextual competition view over alternative interpretations.

Experiment 3

The purpose of Experiment 3 was to examine memory for incongruent and congruent items using a recognition test rather than a recall test. Although there are many memory effects that emerge in mixed lists but not pure lists (for a review, see McDaniel & Bugg {2008]), one of the signature differences between these effects and the LSE is how they manifest themselves in other memory tests. Specifically, although the LSE emerges reliably in free recall, it is consistently absent in standard yes/no recognition tests and cued-recall tests (e.g., Murnane & Shiffrin, 1991; Ratcliff et al., 1990; Verde, 2009; Yonelinas, Hockley, & Murdock, 1992). This is because relative contextual strength plays a diminished role in recognition compared to free recall (e.g., Murnane & Shiffrin, 1991; Ratcliff et al., 1990). However, contextual strength can play a role in recognition when testing conditions require the retrieval of contextual information. For instance, when distractors are highly similar to target items, familiarity alone is insufficient to discriminate them and retrieval of contextual information is necessary for successful performance (e.g. Hintzman & Curran, 1994; Rotello, Macmillan, and Van Tassel, 2000). Indeed, using more difficult tests, some researchers have reported LSE effects in recognition (Diana & Reder, 2005; Norman, 2002).

We proposed that during encoding, incongruent statement accumulate a greater amount of contextual information in their memory trace compared to the congruent statements, leading to an anti-congeniality effect on mixed lists. Based on this hypothesis, we would not expect to observe recognition differences in a standard recognition test, where relative context strength plays a lesser role than in free recall. In contrast, if the targets and distracters are very similar to each other, participants will be required to retrieve more contextual details from the study experience to successfully differentiate old items from new items. Therefore, akin to the effects found in prior research, we would expect to obtain recognition differences between the incongruent and congruent statements on this type of recognition test. To summarize, the contextual competition hypothesis predicts an interaction effect in recognition, with an easy recognition test producing no differences in discriminability of incongruent and congruent items, whereas a more difficult recognition test should produce an advantage for incongruent items over congruent items on mixed lists.

In contrast, many of the effects reviewed by McDaniel & Bugg (2008) have been consistently detected in standard yes/no recognition tests, especially with mixed lists (for the generation effect, see Burns, 1996; Mulligan, Lozito, & Rosner, 2006; for the enactment effect, see Engelkamp, Zimmer, Mohr, Sellen, 1994; for the orthographic distinctiveness effect, see McDaniel, Cahill, Bugg & Meadow, in press; for the perceptual interference effect, see Hirshman & Mulligan, 1991; Nairne, 1988; for the production effect, see MacLeod et al., 2010). Therefore, if the anti-congeniality effect is in the same class of memory phenomena reviewed by McDaniel and Bugg (2008), we would expect to obtain the effect in recognition regardless of the recognition test conditions. This prediction is in contrast to the contextual competition at retrieval hypothesis, which predicts anti-congeniality effect only under difficult recognition conditions.

To create two types of recognition tests, we manipulated the similarity of the target statements to the distractor statements. In the *easy* recognition condition, the distractors represented the opposing view of one of the target statements studied earlier. For example, if participants had studied the conservative statement “Healthcare in the U.S. should remain privatized” during encoding, the distractor used during the easy recognition test was the liberal version of that statement “There should be universal healthcare in the U.S.”. Note that in the easy recognition condition, both the deep structure (i.e., meaning) and the surface structure of the distractors were different from the related study statement. In contrast, in the *difficult* recognition condition, the distractors maintained the same meaning as one of the statements presented during study, but were presented with a different surface structure. For example, the study statement “There should be universal healthcare in the U.S.” was rephrased as “The government should ensure that everyone in the U.S. has healthcare.” While participants can rely on familiarity with the meaning of each statement in the easy recognition condition, discriminating between distractors and targets in the difficult condition should require more direct recollection because only the surface structure, and not the meaning is diagnostic in this case. Indeed, previous research shows that while people easily identify sentences about similar subjects that have been changed in terms of meaning, they are much less accurate at identifying statements for which only the surface structure has been altered, while the meaning was preserved (e.g., Anderson, 1974; Sachs, 1967).

Method

Participants—The participants were 72 UNCG undergraduates who participated for course credit. None of them had participated in the previous experiments. Prior to testing, half of the participants identified themselves as Republicans, and half identified themselves as Democrats. They were recruited though the online scheduling system described in the previous experiments.

As in the previous experiments, the Mehrabian (1996) Liberalism-Conservatism scale was used as an independent measure of political identity. The scores obtained from self-reported Democrats (M= −8.22, SD=4.81) were significantly lower than the scores obtained from self-reported Republicans (M=12.17, SD=7.11), $t(70)=14.26$, $p<.001$, validating their self reports of political party identity.

Materials

Study List: Sixteen new statements regarding eight additional political topics were created using the same procedures described in Experiment 1, and were added to the pool of statements in the current experiment.[1] Each participant studied 24 statements, consisting of half liberal and half conservative statements on different topics. Counterbalancing across participants ensured that each topic was presented equally often in its conservative and liberal form. Statements were presented in an alternating block format, consisting of six liberal and six conservative statements presented per block. Presentation of blocks was counterbalanced such that half of the participants saw conservative statements during the 1st and 3rd block and liberal statements during the 2nd and 4th blocks, while the remaining half of participants studied liberal statements during the 1st and 3rd block and conservative statements during the 2nd and 4th blocks. The presentation order of statements within each block was randomized.

Recognition Test List: The recognition test list was comprised of half *old* statements and half *new* statements. The old statements in both the easy and difficult recognition test lists consisted of verbatim statements that were studied earlier. In the easy distractor condition, the *new* statements were the reverse form of the studied statements. In other words, each distractor in this condition represented the opposing view from a statement that had been studied earlier. In the difficult condition, *new* statements maintained the same meaning as one of the statements that was studied earlier, but were paraphrased and presented with a difference surface structure. All studied topics served as “old” or “new” items equally often. During the recognition test, the old and new statements were presented in a random order. Two thirds of the participants (n=48) were given the easy recognition test, whereas the remaining one third of the participants (n=24) received the difficult recognition test.[2]

Procedure—Prior to the experiment, participants were informed that they should memorize the presented statements, and were instructed to perform the liberal-conservative rating task described in the previous experiments. All statements were presented on a computer screen in a random order at a rate of 10 s per statement. Following encoding, participants completed a self-paced Yes/No recognition test. Participants were informed that they should press the “yes” key if they remembered studying that verbatim statement earlier, and to press the “no” key if they did not study that statement earlier. They were also warned that some of the topics may seem familiar from the study session, but that they may be phrased in a way that is different from the way they were presented during the study session. They were instructed to press the “no” key for those statements. All participants were then given an example illustrating how the “new” statements would be related but not identical to the statements studied earlier. Upon completion of the recognition test, participants completed the Mehrabian (1996) Liberalism-Conservatism scale and were debriefed.

[1]The number of added statements presents an objective limit on the number of political topics for which most people hold pre-existing attitudes.

[2]The context hypothesis predicts no effect in the easy recognition condition, and a significant effect in the difficult recognition effect. Therefore, we placed more participants in the easy recognition condition to increase the power to detect an effect.

Design—This study employed a mixed factorial design, with *Party Identity* (Republican vs. Democrat) and recognition condition (easy vs. difficult) varied between subjects, and *Statement Type* (congruent vs. incongruent) varied within subjects.

Results & Discussion

Discrimination accuracy was assessed by calculating the d' measure. Hits and false alarms were transformed following the procedure recommended by Snodgrass and Corwin (1988), and they are presented in Table 2. A repeated measures ANOVA was conducted on d' scores using *recognition condition* (easy vs. difficult) and *congruency* (congruent vs. incongruent). There was a main effect of congruency, $F(1, 70) = 4.33$, $MSe = .39$, $p < .05$, $\eta^2 = .06$. Overall, discrimination accuracy was greater for incongruent ($M = 1.63$, $SD = .68$) than for congruent statements ($M = 1.48$, $SD = .84$). There was also a main effect of recognition condition, $F(1, 70) = 9.48$, $MSe = .68$, $p < .01$, $\eta^2 = .12$, such that accuracy was greater in the easy condition ($M = 1.71$, $SD = .58$) than in the difficult condition ($M = 1.26$, $SD = .60$). Most importantly, there was a significant congruency x recognition condition interaction $F(1, 70) = 4.55$, $p < .05$, $\eta^2 = .06$. Follow-up tests revealed a significant difference in d' across congruent and incongruent items in the difficult recognition condition $t(23) = 2.18$, $p < .05$, but no difference across statement type in the easy recognition condition, $t < 1$.

These results further support the view that incongruent statements have greater contextual strength than do congruent statements, and suggest that the anti-congeniality effect manifests itself much differently than do the memory effects reviewed by McDaniel and Bugg (2008). For instance, if the anti-congeniality effect were in the same class as the generation, production, and enactment effects, like those effects, it should have emerged in a standard (i.e. easy) recognition condition. However, we did not observe an anti-congeniality effect in the easy recognition condition. Instead, the results are consistent with the context account. Greater contextual strength associated with incongruent items should have no effect on recognition memory when familiarity is sufficient to discriminate old from new items (as in the easy recognition condition). However, it should lead to better recognition memory for incongruent statements when the recognition test requires retrieval of details from the study episode (as in the difficult recognition condition). Indeed, this is exactly the pattern that emerged in the current experiment.

General Discussion

In three experiments, we evaluated remembering and intentional forgetting of attitude statements that were either congruent or incongruent with participants' own political attitudes. Experiment 1 results demonstrated that when participants' goal was to forget congruent and incongruent attitude statements, they showed significant directed forgetting of incongruent but not congruent statements. In contrast, when participants' goal was to remember statements, they recalled incongruent attitude statements better than congruent statements, thereby showing a reliable anti-congeniality effect on mixed lists. This was found both in Experiment 1 and in Experiment 2. The anti-congeniality effect was eliminated on pure lists, where recall of congruent and incongruent statements was equivalent (Experiment 2). It was also absent in one condition of Experiment 3, where memory was tested with an easy recognition test – that is, when the distractors were dissimilar to the targets by the virtue of conveying a different meaning. However, the anti-congeniality effect again emerged in the difficult recognition test condition, where the distractors were more similar to the targets because they conveyed the same meaning using a different surface structure.

Overall, these results support our contextual competition at retrieval hypothesis, which posits that one theoretical mechanism –contextual strength- can explain the array of results observed in the current study. We propose that incongruent attitude statements become more strongly associated with episodic context during encoding than do congruent attitude statements. Consequently, when both types of items are presented on a mixed list, incongruent items have a contextually-based advantage at retrieval, because they come to mind more easily during retrieval and, ultimately, are better recalled. Context also aids in recognition tasks where distractors and targets are similar because successful performance in such tasks requires retrieval of contextual details. Because context serves as a retrieval cue, contextual effects are muted both when all items on a list are associated with similar contextual strength (i.e. pure lists) and when the need for contextual retrieval is obviated (e.g. when recognition targets and lures are dissimilar).

The context advantage for incongruent items explains why they show greater directed forgetting than congruent items when they are studied on mixed lists. This explanation relies on the contextual account of directed forgetting, according to which participants respond to the forget cue by rapidly changing their mental context between the study lists (Sahakyan & Kelley, 2002). At the time of test, context is more similar to List 2 than List 1 context, and therefore items from List 1 have a sampling disadvantage over the items from List 2, producing directed forgetting impairment. In prior research we have shown that items that are more strongly associated with the List 1 study context are affected to greater degree by directed forgetting than items that are less contextually-bound (Sahakyan et al., 2008). The complete absence of directed forgetting of contextually weak (i.e. congruent statements) also replicates previous findings (Sahakyan et al. 2008) and can be directly addressed by the context account. Specifically, while incongruent items “win” the retrieval competition in the remember group because they are associated with stronger contextual information, this competition is greatly reduced in the forget group because the “strong” incongruent items are forgotten to a much greater extent than are the “weak” congruent items. Because the forget instruction disproportionally reduces the number of “strong” incongruent items that compete at retrieval, the congruent items are able to recover from competition. In other words, there is a trade-off in the forget group, where the loss of strong items actually aids memory of weak items to such an extent that weak items can escape the costs of directed forgetting entirely. Overall, the results of Experiment 1 resemble the previous findings from our lab and are fully consistent with the proposed hypothesis.

While we explained the directed forgetting findings from the perspective of the contextual account, it is unclear how they could be addressed by the inhibitory account, which posits that the costs of directed forgetting are due to retrieval inhibition of List 1 items. The inhibitory mechanism is said to work by blocking access to the entire to-be-forgotten list, therefore, it is not immediately obvious why in Experiment 1, incongruent items suffered from inhibition, whereas congruent items did not. Furthermore, as outlined above, contextual competition is necessary to explain the results in the remember conditions of all three experiments. Thus, it appears that an explanation based on differences in context strength provides a parsimonious explanation for both the forgetting and remembering results of the current study.

Previous research on directed forgetting suggests that often when List 1 items are forgotten, List 2 items benefit from forgetting because of reduced interference between the lists. Thus, we expected that items that suffered from directed forgetting on List 1 would benefit on List 2. In the current experiment, only incongruent statements were forgotten on List 1, therefore, any benefits should have emerged as an anti-congeniality effect on List 2, with better recall of incongruent items than congruent items. However, we did not observe an anti-congeniality effect on List 2 in the forget group, and consequently also failed to observe the

benefits of directed forgetting. Thus, the lack of an anti-congeniality effect on List 2 in the forget condition, might be linked to the lack of directed forgetting benefits.

The controlled study strategy employed in our experiment may be one reason for the observed lack of benefits. Prior research suggests that when the study strategy is controlled across the lists, the benefits are not observed (Sahakyan & Delaney, 2003; Sahakyan & Delaney, 2010). Some accounts of directed forgetting benefits attribute them to a change in the study strategy between the two lists (Sahakyan & Delaney, 2003) or a reset of encoding processes following the forget cue (Bäuml et al., 2008). By requiring participants to perform the same rating task across both lists in Experiment 1, we reduced the possibility that benefits would be observed because there was little opportunity or a need to shift to a different study strategy. Another reason for the observed lack of benefits could be driven by the use of more complex study materials employed in our experiments. The benefits of directed forgetting are not always obtained with the costs (Conway et al., 2000; Delaney & Sahakyan, 2007; Sahakyan & Goodmon, 2007; Pastötter & Bäuml, 2010), and whenever they are obtained, they are typically found with word lists. However, complex materials such as self-relevant, autobiographical memories (Barnier at al., 2007; Joslyn & Oakes, 2005), or related action phrases (Sahakyan, Delaney, & Goodmon, 2008) did not produce the benefits in previous studies. Therefore, the lack of benefits with attitude statements is not inconsistent with other findings in the field.

On a surface level, there are similarities between our Experiment 2 results and many other memory phenomena that emerge on mixed lists and are reduced or eliminated on pure lists (for a review, se McDaniel & Bugg, 2008). However, we argue that the anti-congeniality effect is not likely to be driven by the same mechanisms that underlie many of the effects reviewed by McDaniel and Bugg (2008). Several findings support this argument. First, the memory effects reviewed by McDaniel and Bugg are thought to arise partly because distinctive items are more elaborately encoded than are common items. In line with this assumption, distinct items are not only better recalled than common items on mixed lists, but they are also better recognized (e.g. Burns, 1996; Engelkamp et al., 1994; Hirshman & Mulligan, 1991; McDaniel et al., in press; Mulligan et al., 2006; Nairne, 1988). Therefore, in the current study, if incongruent statements were more elaborately encoded because they were more distinct, then they should also have been better recognized than congruent items in both recognition conditions of Experiment 3. However, we did not observe an anti-congeniality effect using a familiarity driven recognition test. Instead, the anti-congeniality effect emerged only when the recognition test required retrieval of contextual details. Second, whereas we observed a list-strength effect in Experiment 2, prior research suggests that depth of encoding manipulations do not produce such effects (Malmberg & Shiffrin, 2005). Although McDaniel and Bugg's (2008) framework does predict an LSE pattern, we found no evidence for differential encoding of order information for congruent and incongruent items across the mixed and pure lists as would be predicted by this framework. Finally, whereas we observed differential forgetting between congruent and incongruent statements in Experiment 1, previous directed forgetting studies using both a prototypical manipulation from McDaniel and Bugg's (2008) framework (Sahakyan & Foster, 2009) and other depth of encoding manipulations (Sahakyan et al., 2008) have not produced differential forgetting across encoding conditions. In sum, the observed results across the three experiments are difficult to reconcile with alternative explanations, and the contextual competition at retrieval hypothesis provides a unifying account of the results.

Research from other domains provides supporting evidence as to why incongruent attitude information may be more strongly associated with the episodic context of the experiment than congruent attitude information. Particularly, research shows that when participants are allowed to control their own exposure to informational materials, they choose to expose

themselves more often to information that is consistent with their own attitudes or choices than information that is inconsistent – known as the *selective exposure effect* (for reviews see Cotton, 1985; Frey, 1986; Hart, Albarracín, Eagly, Brechan, Lindberg & Merrill, 2009). The most recent meta-analysis on this topic found that people are twice as likely to expose themselves to congruent than to incongruent information, and that of all the issues included in the meta-analysis, this bias was the strongest for political issues (Hart et al., 2009). In light of this evidence, it appears that congruent attitude information becomes associated with many different pre-experimental contexts compared to incongruent attitude information. This is notable, because previous research suggests not only that items that occur in fewer pre-experimental contexts are better remembered than items that occur in many different contexts (e.g. Hicks, Marsh, & Cook, 2005; Marsh, Meeks, Hicks, Cook & Clark-Foos, 2006), but also that they show greater forgetting when the environmental context at test mismatches the environmental context of encoding (Marsh et al., 2006). Thus, prior research provides credibility to the proposal that incongruent statements become more contextually bound than congruent statements.

Given that the study materials concerned heavily debated political issues that were personally relevant to our participants, it is possible that they evoked strong emotional reactions. Although emotional materials are better remembered than neutral materials, such effects emerge both in free recall tests and in recognition tests (for reviews see Buchanan & Adolphs, 2002; Dolan, 2002; Hamann, 2001). Therefore, if incongruent statements had a recall advantage on mixed lists because they evoked stronger emotional reactions than congruent items, then an emotion-based advantage should also have been observed in both conditions of the recognition test in Experiment 3. However, we did not observe this pattern.

Our findings suggest that context interacts with the composition of political views people encounter within a single experience to determine what information they will best be able to intentionally remember or forget from that experience. One implication of the mixed versus pure list findings is that the ability to remember information presented by political candidates may differ greatly depending on whether that information is encountered during separate speeches or during a debate, which are similar to pure and mixed list presentations, respectively. For instance, if a voter's goal is to remember the views each candidate expressed during a debate, they may be more likely to later remember views that the opposing candidate expressed than the views expressed by the candidate from their own party. However, if the voter decides that they want to forget candidate views (e.g., because they later learned of a scandal involving a particular candidate), they may be much more likely to forget those views that were expressed by the opposing party candidate than those of their own party's candidate.

In conclusion, the experiments presented in this paper confirm the importance of context strength in directed forgetting. Additionally, to the best of our knowledge, episodic context strength has not been previously considered as a factor in the attitude memory literature. Given that the congeniality effect and anti-congeniality effects are highly inconsistent (Eagly et al., 1999) and the reasons for such inconsistency are not fully understood, our research suggests a new factor that might potentially help to resolve the puzzle of why these effects are elusive in some studies, and robust in others.

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Highlights

- Remembering and directed forgetting of congruent and incongruent attitude statements
- Mixed list memory and forgetting greater for incongruent items than congruent items
- List strength effect confirmed by anti-congeniality effect on mixed but not pure lists.
- Anti-congeniality in recognition only when test conditions required retrieval of contextual details
- Results support the proposed contextual competition at retrieval hypothesisa

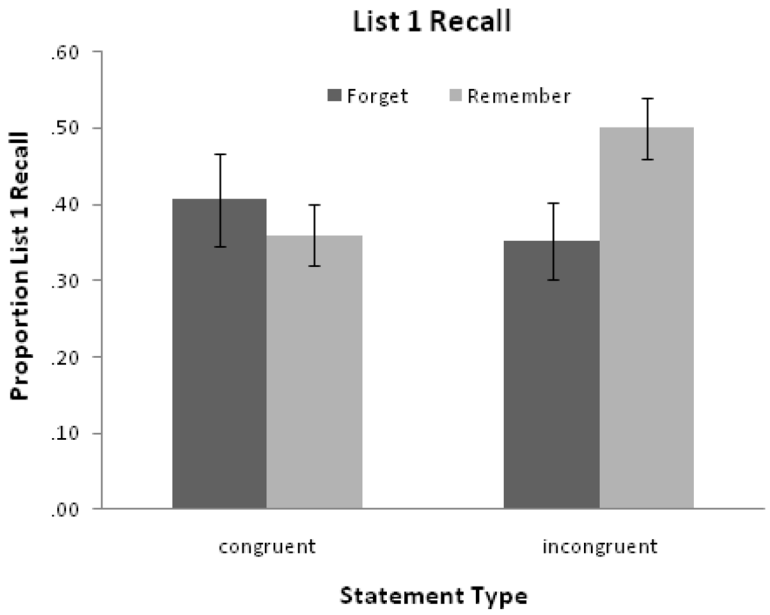

Figure 1.
Mean proportion List 1 recall by cue and type of statement in Experiment 1. Error bars represent *SE* of the mean.

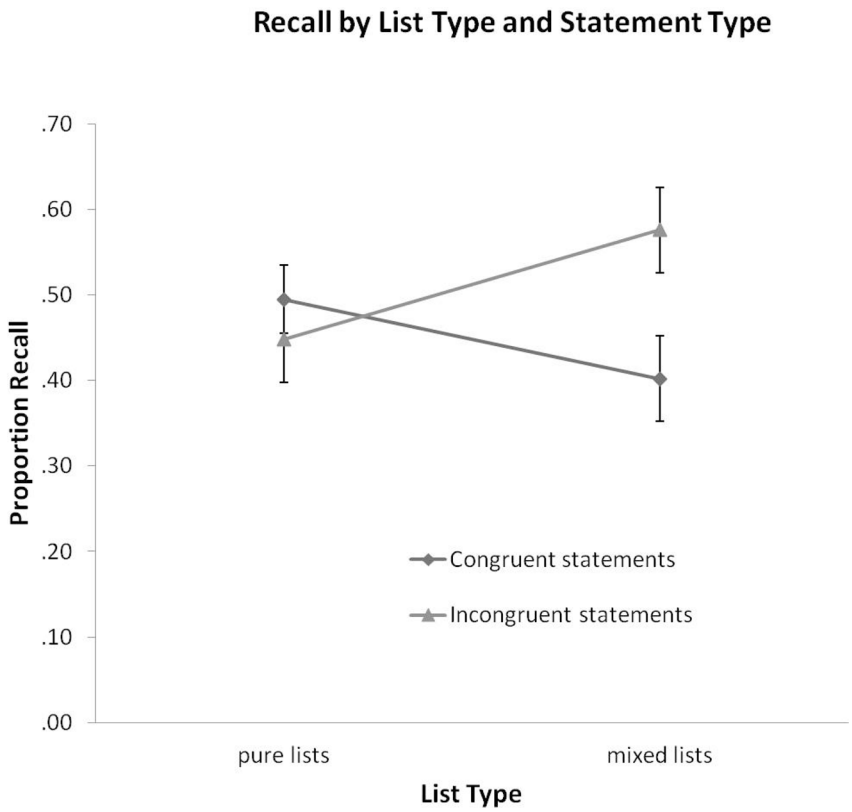

Figure 2.
Mean proportion statement recall by list type and statement type in Experiment 2. Error bars represent *SE* of the mean.

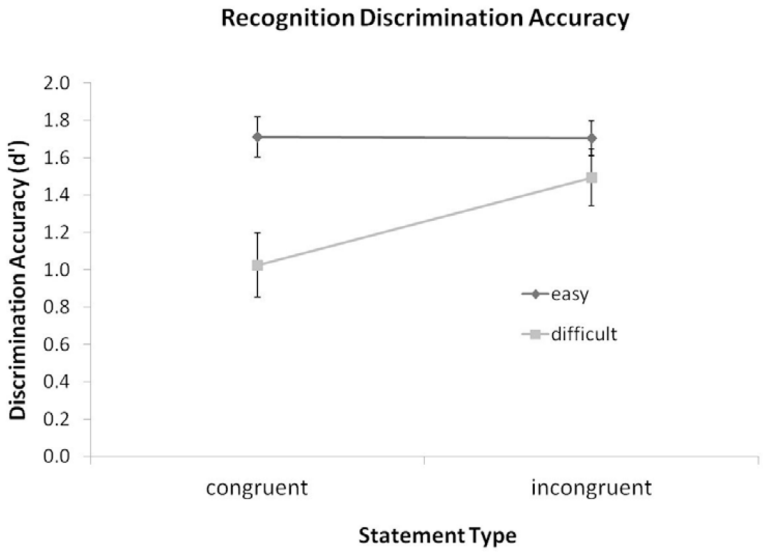

Figure 3.
Mean Discrimination Accuracy as a function of statement type and recognition condition in Experiment 3. Error bars represent *SE* of the mean.

Table 1

Proportion List 2 recall by statement type and cue in Experiment 1 and Experiment 2.

	List 2 Recall			
	Congruent Statements		Incongruent Statements	
Cue	*M*	*SE*	*M*	*SE*
Forget	.47	(.05)	.45	(.05)
Remember	.48	(.04)	.54	(.04)

Table 2

Mean corrected Hits and False Alarms by statement type and recognition condition in Experiment 3.

	Congruent Statements		Incongruent Statements	
Easy Condition	***M***	***SE***	***M***	***SE***
Hits	.75	(.02)	.77	(.02)
False Alarms	.20	(.02)	.21	(.02)
Difficult Condition				
Hits	.67	(.04)	.73	(.03)
False Alarms	.32	(.03)	.24	(.04)