

Priming, Emotion, and False Recall:

Expanding on Roediger & McDermott

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Abstract

Creating False Memories (1995) from Roediger & McDermott is a seminal psychological work in the study of false recall and semantic priming. Our study sought to expand on R & M's initial results by examining whether being primed with an emotional lure (spider) would lead to more subsequent false recall of that lure when compared with similar priming of a non-emotional lure (chair). By dividing 32 participants into 2 groups, which were either primed with photos of our critical lures or not, we proved that, indeed, emotional priming had a strongly significant effect on subjects' subsequent susceptibility to false recall of emotional material, while our non-emotional stimuli did not exhibit this effect. These results have implications for emotional eyewitness reports and false recall studies generally.

Priming, Emotion, and False Recall

The 1995 paper from Roediger & McDermott *Creating False Memories: Remembering Words Not Presented in Lists* had heavy influence both in the psychological and legal communities (as attested to by nearly 3,000 citations). The study demonstrated how words that are semantically similar to others in a list are often falsely remembered as having actually been presented to participants given a free recall task. This effect is robust enough to be observed about 40% of the time across a wide variety of lists that contain lots of semantically related words intended to prime false recall of a particular critical lure (e.g. subjects would misremember the critical lure “fruit” on a list that contained words such as “kiwi”, “salad”, “orange”, and “vegetable”). The authors even found that some critical lure words were falsely recalled even more frequently than some words that were actually on their test lists of 15 items (usually those near the middle of the list). The implications of this evidence for semantic priming are clear: if non-existent items on a list might be falsely recalled, what else might eyewitness reports confidently get wrong?

In this present study, Lee, Atkin, and I built off of Roediger and McDermott’s results and experimental paradigm and examined the well-substantiated false recall effect through another lens, one that explicitly took into account emotion. The 1995 paper presented lists of varying emotionality but did not analyze emotion as a factor in any of its results. In addition, the original experiment did not consider the possibility of priming participants with other material before the presentation of the lists. Our current experiment takes up both these tasks in order to closely explore the effect of emotional priming on false recall. We hypothesized that there would be a greater relative increase in the false remembrance of an emotional critical lure when primed with

that emotional critical lure before list presentation than in the false remembrance of a neutral critical lure when primed with that neutral critical lure before list presentation.

Methods

Participants – Pomona College students ($n=32$) ranging in age from 18-23 for this experiment were recruited by word of mouth for this experiment. Participants of one gender were not recruited over another and, further, participants were not recruited with attention to any other particular characteristic. Our two experimental groups consisting of 16 participants each were generated randomly. There was no compensation for participation.

Materials – We used Microsoft PowerPoint and portable laptop computers to present all material. 20 photos were selected as material from the International Affective Picture System (IAPS), provided by Dr. Deborah Burke of Pomona College, and they were internally matched using the IAPS manual as to have equal distribution of high-valenced, low-valenced, high-arousing, low-arousing, animate, and inanimate pictures in our sample. The lists of words used in our experiment were those used in the original Roediger and McDermott experiment from 1995 (see Figure I). We used Microsoft Excel and the statistical software SPSS to compile and analyze the data, which was drawn from participants' pen and paper free recall responses

Procedure – All participants gave verbal informed consent to help with our experiment and were tested in isolation from any possible distractions. To account for any possible recency effects, the order of presentation of our materials to our 32 participants was counterbalanced throughout the experiment (i.e. one subject might be shown the neutral critical lure first and be presented with the emotional list first and another might complete the same tasks in the opposite order).

Our first group of participants ($n=16$) was not given a priming task and only completed the free recall of list items portion of the experiment. They were told initially just to attend to the

words presented in a list and were then presented with a practice list of words (for which the critical lure was “fruit”). Like subsequent test lists, there were a total of 15 words in this list and each word was presented for two seconds each. After the last word was presented, they were given a challenging working memory task, counting backwards by a certain number from another number for 30 seconds. For example, one of the distracting tasks was to count backwards by 7 starting from 232. All working memory tasks were given directly after each list finished and were different so as to keep the participants from rehearsing their free recall responses. Following this counting task, subjects freely recalled on paper all of the words that they remember as being on the list for up to 2 minutes. Afterwards, half of these participants ($n=8$) were presented with the neutral critical lure list-recall task first and then the emotional critical lure list-recall task, and the other half of the participants ($n=8$) were given the same lists and tasks in reverse order. The procedure implemented for these lists was the same as for the practice list, except we additionally recorded if the critical lure (“chair” for the neutral/non-emotional list and “spider” for the emotional list) was falsely recalled by the participants in their responses.

The participants in our second experimental group ($n=16$) completed the free recall of list items exactly as described above but this portion of the experiment was preceded by our picture-priming task, which was falsely presented as a pilot test of an unrelated study. In the picture-priming task, the participants were shown 20 IAPS-rated pictures and asked to respond as quickly as possible whether the main object in the picture was animate or inanimate. The experimenter pretended to record the accuracy and response time for each of these experimentally irrelevant responses. The ninth and tenth pictures in this presentation were the critical lures of interest in the latter half of our experiment (these IAPS photos of a spider and chair are in Figure II). Half of these participants ($n=8$) were given the picture of the emotional

critical lure (spider) as the ninth picture and the neutral critical lure (chair) as the tenth, while the other half (n=8) were presented the pictures vice versa.

Results

The data collected is graphically summarized in Figure III. Initial t-tests were run in order to test for the presence of any confounding variables. There were no statistically significant differences found either when comparing the total number of lures recalled when participants were presented with the priming picture task versus when they were not primed ($t = .4970$, $p > .62$) or when comparing the total number of neutral critical lures remembered versus emotional critical lures remembered over the course of the entire experiment ($t = 1.5154$, $p > .13$). Because the data did not have exact numerical values attached to it, an ANOVA was not possible and instead every participant response that recalled a critical lure was coded as “1” and the lack of such a response was coded as a “0”. In order to determine if the number of critical lures, of varying emotionality, remembered were significantly affected by the presence, or lack thereof, of the picture-priming task, two Pearson’s chi-squared tests were applied. The decrease of 13 neutral critical lures recorded without priming to 8 recorded with priming trended towards but did not reach the threshold for statistical significance (χ -squared = $3.46 < 3.84$, $df = 1$, exact significance = $.068 > .05$). Meanwhile, the increase of 4 emotional critical lures recorded without priming to 11 with priming was statistically significant (χ -squared = $6.15 > 3.84$, $df = 1$, exact significance = $.016 < .05$). Credit is due to Patricia Xi of Claremont Graduate University for help with statistical tests.

Discussion

Our initial hypothesis was proved correct. There was a greater relative increase in the emotional lure being falsely recalled due to priming than in the neutral critical lure being falsely

recalled as a result of priming. Our results reached statistical significance by a wide margin, and, while false recall of the emotional lure “spider” went up 175% (from 4/16 to 11/16 times) as a function of priming, the neutral lure “chair” being falsely recalled actually decreased 38% from 13/16 times without priming to 8/16 times with picture presentation. So, not only was there a relatively greater increase in the false recall of the emotional critical lure with priming, there was also a simultaneous decrease (although not a statistically significant one) in the recall of the neutral critical lure. It should be noted that the ratio of 13/16 false recalls for “chair” in the not-primed condition is an aberration, even in reference to Roediger & McDermott’s initial findings. This may be due to the limited number of lists we were able to present, which made outliers more noticeable in the data.

The present results both bolster the findings of Roediger & McDermott’s 1995 paper that served as inspiration for this experiment and demonstrate a novel finding. The emotional stimuli (a picture of a spider that was presented but not consciously attended to any more than the 19 other photos that were shown, allegedly as part of another experiment) triggered binding mechanisms that were evidently not active without this initial picture-priming stage. There was a clear result of subjects binding onto the highly arousing and negatively valenced semantic idea of “spider”: the semantically related, but not-present, word “spider” was falsely recalled as being on a list intended to prime it nearly three times as often. As stated above, there was no similar significant interaction between the picture and word “chair” because this semantic concept failed to trigger any emotional binding mechanisms. What is the implication of this? In the same vein of concern referenced earlier, we know now experimentally that not only are confident eyewitness reports to be taken skeptically, but if an eyewitness was in an emotional state or

responding to highly emotive events there is even more reason not to take them at their, potentially falsely-recalling, word.

References

Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (2005). *International affective picture system (IAPS): Instruction manual and affective ratings*. Technical Report A-6. University of Florida, Gainesville, FL.

Roediger, Henry L., and Kathleen B. Mcdermott. "Creating False Memories: Remembering Words Not Presented in Lists." *Journal of Experimental Psychology: Learning, Memory, and Cognition* 21.4 (1995): 803-14. Web.

Figures

Emotional List	Critical lure: spider	Neutral List	Critical lure: chair
web	tarantula	table	sofa
insect	poison	sit	wood
bug	bite	legs	cushion
fright	creepy	seat	swivel
fly	animal	couch	stool
arachnid	ugly	desk	sitting
crawl	feelers	recliner	rocking
silk		bench	

Figure I – the two experimental lists used in our experiment from Roediger & McDermott (1995) along with the critical lures primed by presentation of these lists



Figure II – the critical lure IAPS-rated pictures used in the picture-priming portion of the experiment

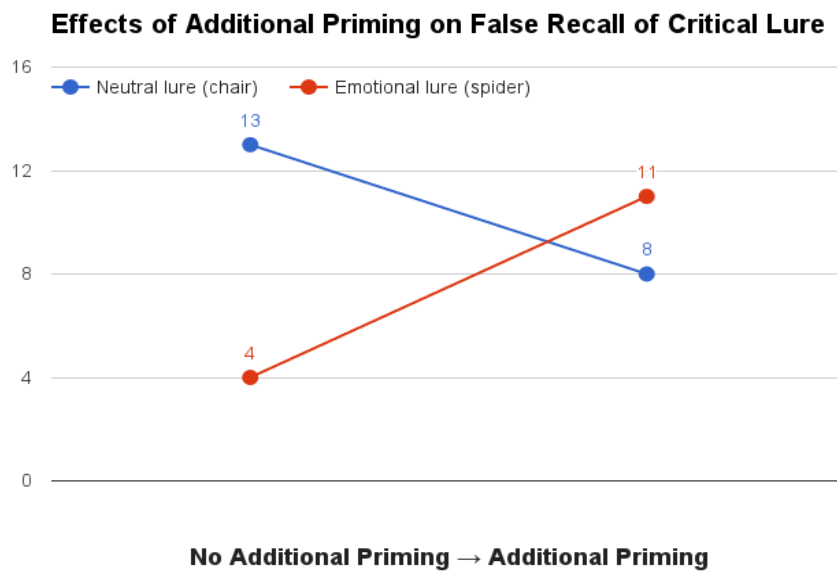


Figure III – the results of our experiment: the number (out of 16) of critical lures falsely recalled as a function of whether or not participants were presented with the picture-priming task before the free recall of list tasks