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Attenuating social affective learning effects with Memory Suppression manipulations

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ABSTRACT

People can form opinions of other individuals based on information about their good or bad behavior. The present study investigated whether this affective learning might depend on memory links formed between initially neutral people and valenced information. First, participants viewed neutral faces paired with sentences describing prosocial or antisocial behaviors. Second, memory suppression manipulations with the potential to aid in the forgetting of valenced information were administered. Using the Think/No think paradigm, the effectiveness of four different suppression instructions was compared: Unguided Suppression, Guided Suppression, Distraction, and Thought Substitution. Overall, all the tasks appreciably reduced affective learning based on prosocial information, but only the Guided Suppression and Thought Substitution tasks reduced affective learning based on antisocial information. These results suggest that weakening the putative memory link between initially neutral people and valenced information can decrease the effect of learned associations on the evaluation of other people. We interpreted this as indicative that social affective learning may rely on declarative memories.

1. Introduction

In laboratory settings, people come to attribute affective value of other people when these people's faces are associated with affectively charged stimuli through pairings or explicit instructions. To illustrate this, let us consider the following examples. Hermans, Vansteenwegen, Crombez, Baeyens, and Eelen (2002) found a decrease in liking for the pictures of faces paired with an aversive electrocutaneous stimulus. Baeyens, Eelen, Van den Bergh, and Crombez (1992) showed that neutral faces underwent a revaluation when paired with pleasant and unpleasant face pictures. Bliss-Moreau, Barrett, and Wright (2008) reported changes in liking and disliking of people when participants were shown initially neutral faces of these people and asked to imagine the pictured person performing prosocial or antisocial behaviors.

A large body of literature on impression formation and evaluative learning has been amassed over the past fifty years (e.g., Anderson, 1965, 1981; Asch, 1946; Bohner & Wänke, 2002; Chaiken & Stangor, 1987; Eagly & Chaiken, 1993; Hovland, 1951; Hovland, Janis, & Kelley, 1953; Olson & Zanna, 1993; Petty & Cacioppo, 1986; Petty, Fabrigar, & Wegner, 2003). Recently, Bliss-Moreau et al. (2008) developed a minimalist impression formation paradigm that has proven to have both practical and theoretical values. At the practical level, it represents the way people might learn about the value of others based on information about their good or bad behavior in everyday situations. At the theoretical level, studying the mechanisms underlying this type of social affective learning is fundamental to our understanding how people form opinions about others, which presumably help people to navigate their social world. However, more work clearly needs to be done to better understand the mechanisms of this social affective learning. Although suggestive, the data reported by Bliss-Moreau et al. (2008) do not answer an important theoretical question: Does the picture of a person come to elicit an affective response because a memory link was formed between it and emotional information? One way to address this question would be to manipulate the [effective] strength of the memory link by experimentally suppressing the memory of the emotional information that was previously paired with the neutral faces. Because this is a problem of learning and memory, studies of memory control examining the potential of various instructions to suppress subsequent retrieval of emotional memories attracted our attention. We reasoned that this sort of social affective learning may rely on declarative memories, which consist of storing and retrieving emotional information about others. We then asked whether a reduction of [expressed] affective learning could be achieved by experimentally suppressing the memory of the emotional information about others that previously accompanied the neutral faces. In this case, it is useful to consider each of the two possible outcomes and their respective interpretations. First, if suppressing emotional memories of others attenuates affective

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learning effects, it would provide support for the view that declarative memories have a causal role in such learning. Second, if affective learning effects were not modulated by memory suppression, then it would imply that the memory link between the neutral faces and the emotional information is not a major contributing factor for such learning effects to occur.

In the literature on memory control, variants of the Think/No think paradigm have been used to examine whether suppressive mechanisms can operate on memory representations (e.g. Anderson & Green, 2001; Depue, Banich, & Curran, 2006; Marx, Marshall, & Castro, 2008). For example, in Marx et al. (2008), participants were exposed during the training phase to cue word-target word pairs on a computer screen. In an initial test phase, the cues were presented and the participants were asked to recall the associated target. Then, during the treatment phase, participants were shown only the cues. For some cues, participants were instructed to try to suppress thoughts of the associated target (No think condition), whereas for other cues, they were instructed to think of the associated target (Think condition). Cues that were presented in green indicated the Think condition, whereas cues presented in red indicated the No think condition. These manipulations did not involve additional presentations of the associated targets, so cognitive control had to be applied to internal memory representations. In the final phase of the experiment, recall of each target item in response to its cue was assessed. Relevant to our present study, the results of Marx et al. (2008) indicated that recall of target words in the No think condition was inferior to recall of words in the Think condition; and importantly, they also found that unpleasant targets were less forgotten (i.e., they were better recalled) than pleasant targets. Later in the paper, we discuss the possible reasons for the moderating effect of stimulus valence on memory suppression.

The training phase of a prototypical Think/No think paradigm is highly similar to the conditioning phase of the impression formation paradigm developed by Bliss-Moreau et al. (2008); in both paradigms, participants are instructed to learn associations between many neutral cues and emotional target stimuli under minimal learning conditions (i.e., a small number of presentations per pair). To test for the role of contingency memory between neutral faces and emotional information in learning the affective value of faces using Bliss-Moreau et al.'s paradigm, the strategy of the present experiment was to add a subsequent treatment phase involving Think/No think manipulations and then to assess the influence of memory suppression produced by the various No think manipulations on the affective ratings of the conditioned faces. We here use the term 'conditioned' in the sense that at test a conditioned face presumably activates the emotional information that is now associated with it.

It is possible that suppressing negative memories is more difficult than suppressing positive memories because natural selection has, for functional reasons, favored the retention of information concerning aversive events (e.g., Seligman, 1971). Therefore, stronger memory suppression techniques might be needed to weaken negative memories. In addition to the commonly used Think/No think procedure described above (e.g. Anderson & Green, 2001; Depue et al., 2006; Marx et al., 2008) in which participants are only instructed to suppress the original targets (without guided instructions), we employed two other related techniques that have proven effective elsewhere in suppressing negative memories: Guided Suppression and Thought Substitution. In the guided version of the Think/No think procedure, participants receive direct suppression instructions (borrowed and adapted from Schie, Geraerts, & Anderson, 2013). Schie et al. (2013) found that very detailed instructions for memory control facilitated suppression of negative memories. In Thought Substitution, participants are instructed to think of new information of neutral valence to keep from remembering (i.e., interfering with) the original emotional targets (borrowed and adapted from Joormann, Hertel, Brozovich, & Gotlib, 2005). Joormann et al. (2005) found that participants were able to suppress both negative and positive memories by using a Thought Substitution technique. Additionally, we designed a Distraction procedure (adapted from Loftus, 1972) that consisted of instructing the participants to count backwards by threes to prevent them from rehearsing the original targets. Loftus (1972) found that such a Distraction task during acquisition decreased memory performance for neutral pictures. However, it should be noted that this technique has not been used within the paradigm of suppressing previously established memories as far as we know. Therefore, using this technique on established memories may or may not be obtained, especially with negative memories because it is possible that to suppress negative memories only strong memory suppression strategies, such as Guided Suppression and Thought Substitution, will be effective.

In our procedure, after the pretraining rating phase of 40 'neutral' faces, participants viewed neutral faces paired with sentences describing prosocial or antisocial behaviors. During this learning phase, they were asked to imagine a person with the presented face performing the behavior described. This was followed by a phase of post-training affective ratings of the 40 faces. Next, participants were asked to covertly perform one of four memory suppression tasks (presented above) along with a 'remember' task during which the 40 faces were sequentially presented and for half of the faces they were asked not to think about the related social behaviors, whereas for the other half of the faces participants were asked to think about the related behaviors. Subsequently, there was a phase of post-treatment affective ratings of the 40 faces. Finally, as a manipulation check for memory suppression, there was a recall test of the social behaviors cued by each of the 40 faces.

First, we predicted that a conventional effect of affective learning would be observed after the learning phase that consisted of pairing neutral faces with sentences describing negative and positive behaviors. That is, we expected to observe high affective ratings for $Faces_{Pos}$ (faces paired with positive behaviors) and low ratings for $Faces_{Neg}$ (faces paired with negative behaviors). Second, in the event that we obtained any effect of memory suppression within our paradigm of social affective learning, we anticipated that affective ratings of $Faces_{Pos}$ in the No think conditions would decrease in the four memory suppression groups. Moreover, in light of the expected greater difficulty in reducing negative affective ratings, we expected that attenuated ratings of $Faces_{Neg}$ might be obtained only with the Guided Suppression and Thought Substitution procedures because these strategies are most strongly oriented toward retrieval suppression. More generally, one potential benefit of research is to shed light on the role of contingency memory between faces and emotional information on [expression of] social affective learning.

2. Method

2.1. Participants and design

A total of 148 undergraduate students (approximately 65% females and 35% males; ages 18–23 years; 37 participants per group) at the State University of New York at Binghamton participated in this study for partial fulfillment of a course requirement. All of them gave their informed consent to participate in the experiment. A 2 (Behavior: Negative, Positive) × 2 (Instruction: Think, No think) × 3 (Phase: Pre-test, Conditioning, Treatment) × 4 (Memory Suppression: Unguided Suppression, Guided Suppression, Distraction, Thought Substitution) mixed design analysis of variance (ANOVA) was employed, with the first three factors being within-subject variables and the fourth factor being a between-subject variable. The participants were randomly assigned to one of the four memory suppression groups with the constraint that the groups were balanced as closely as possible with respect to gender. The data from 30 participants were not used in the analyses because either these participants did not correctly provide sufficient input to all the dependant variables, defined as failing ($n = 23$) (i.e., the datasets of participants who had to respond at all on more than 50% of the trials' missing responses were excluded ($n = 23$), or