



Individual differences in false memory from misinformation: Personality characteristics and their interactions with cognitive abilities

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ABSTRACT

This research investigated the associations among personality characteristics, cognitive abilities, and false memory induced by misinformation. Chinese college students ($N = 436$) participated in a misinformation study and received a battery of cognitive tasks and personality measures. Results showed that false memory was positively related to persistence, self-directedness, and active coping, but negatively related to depression, fear of negative evaluation, novelty seeking, negative coping, and cognitive abilities. Importantly, significant interaction effects were found between personality factors and cognitive abilities. Individuals with particular combinations of personality characteristics and cognitive abilities (i.e., low fear of negative evaluation, low harm avoidance, high cooperativeness, high reward dependence, and high self-directedness in combination with relatively low cognitive abilities) were more vulnerable to the misinformation effect.

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1. Introduction

Past research on false memories has primarily focused on the experimental conditions that can create different amounts and types of false memories (Loftus, 2005). Recently, this area of research has experienced a growing interest in individual differences in false memory (Eisen, Winograd, & Qin, 2002). Although not always consistent, accumulating evidence shows that individuals with certain personality and cognitive characteristics show greater propensity for experiencing false memories. In our recent study of cognitive factors in false memory (Zhu et al., submitted for publication), for example, we found that cognitive abilities were negatively associated with greater likelihood of having false memory. In this study, we extended our previous research to include personality factors in false memory.

The present study had both hypothesis-testing and exploratory components. A number of studies have linked personality and other individual characteristics to false memories. Few of them, however, have used the misinformation paradigm. Therefore, the first aim of the current study was to extend previous findings to misinformation false memory. We used a large sample and an extensive battery of measures of personality and related constructs. Given our previous findings on the importance of cognitive

factors in misinformation false memories, this study's second aim was to explore whether personality and cognitive abilities had interactive effects on misinformation false memory. In the following paragraphs, we first review previous literature on the personality factors in false memory that are most relevant to the current study, and then discuss the rationale for our exploratory examination of potential interactions between personality and cognitive abilities on false memory.

1.1. Personality factors and false memory

1.1.1. Dimensional personality traits

Several studies have correlated measures of dimensional personality traits with individual differences in false memory. Porter, Birt, Yuille, and Lehman (2000) found that subjects scoring low on extraversion were more susceptible to creating false childhood memories. Liebman et al. (2002) found that false memory from misinformation (labeled as suggestibility in that study) was positively associated with three subscales of the NEO Personality Inventory (values of the Openness dimension, and modesty and altruism of the Agreeableness dimension). Salthouse and Siedlecki (2007), however, did not find significant correlations between personality traits and false memory of words as measured by the Deese–Roediger–McDermott (DRM) method (i.e., lists of semantically related words can lead to false memories of seeing the critical “lure” words that were not presented, Roediger and McDermott (1995)).

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1.1.2. Dissociation

Dissociative experience, or the tendency to have disturbances of normal integration of awareness, thought, memory and personality (Carlson & Putnam, 1993), has weak to moderate associations with several kinds of false memories (Eisen & Lynn, 2001), including false childhood memories (Qin, Ogle, & Goodman, 2008), errors induced by misleading questions (Merckelbach, Muris, Rassin, & Horselenberg, 2000), and DRM false memory (Winograd, Peluso, & Glover, 1998). Some studies have not replicated this finding (e.g., Wilkinson & Hyman, 1998).

1.1.3. Depression

Most of the significant findings regarding the positive relation between depression and false memory came from special populations, such as subjects with PTSD or self-reported alien abduction (Clancy, McNally, Schacter, Lenzenweger, & Pitman, 2002; Zoellner, Foa, Brigidi, & Przeworski, 2000). Using a non-clinical sample, Salthouse and Siedlecki (2007), however, did not find a significant relation between DRM false memory and depression. Storbeck and Clore (2005) further found that negative mood was related to less DRM false memory.

1.1.4. Anxiety

In a study of patients with PTSD, Zoellner et al. (2000) found that DRM false recall was positively related to anxiety. Similarly, Gudjonsson (1988) found that social-evaluative anxiety (measured by the Fear of Negative Evaluation Scale) was positively associated with interrogative suggestibility (a form of susceptibility to false memory as induced by misleading questions). In contrast, Roberts (2002) found that when under stress (i.e., right before the final examinations), students with low anxiety were more likely to have false memory of words as pictures.

1.1.5. Coping strategies

Gudjonsson (2003) emphasized the importance of coping strategies in the suggestion process. Gudjonsson (1988) found that subjects who used avoidance coping had much higher suggestibility scores than those who used active coping. Howard and Hong (2002) found that emotion-focused copers scored significantly higher on suggestibility than did problem-focused copers.

As the above review shows, although several studies have examined the personality correlates of false memory induced by paradigms such as the DRM and misleading questions, but few have involved false memory induced by the misinformation paradigm (see Liebman et al., 2002, for an exception). This paradigm is commonly used to elicit false memory related to eyewitness inaccuracies. It involves three standard stages: experiencing an event, receiving misinformation, and being tested for memory of the original event (Loftus, 2005). False memory is created when subjects report information from the misinformation session as part of the original event. Given that false memories induced by different paradigms are only modestly related to one another and are likely to involve different cognitive processes (Qin et al., 2008), it is important to extend the current research to include personality correlates of misinformation false memory.

The current study examined the following correlates of misinformation false memory: dimensional personality factors (the Temperament and Character Inventory-Revised (TCI-R), which includes seven dimensions: harm avoidance, cooperativeness, reward dependence, self-directedness, persistence, novelty seeking, and self-transcendence), dissociation (the Dissociative Experiences Scale), depression (the Beck Depression Inventory-II), anxiety (the Beck Anxiety Inventory and the Brief Fear of Negative Evaluation Scale), and coping styles (the Brief COPE Inventory). Although previous findings were not always consistent, the preponderance of evidence led us to hypothesize that false memory from misinfor-

mation would be positively related to dissociation, depression, anxiety, and negative coping, and negatively related to active coping. In terms of dimensional personality scales, no study has used the TCI-R. Given the documented associations between dimensions of TCI-R and the NEO Personality Inventory (Cloninger, 1999), we hypothesized that false memory would be positively related to cooperativeness and reward dependence of TCI-R (based on Liebman et al.'s (2002) results on agreeableness of the NEO, which is positively related to the above two dimensions in TCI-R), and negatively to novelty seeking (based on Porter et al.'s, 2000 finding with extraversion). We did not advance specific hypotheses about other four TCI-R dimensions.

1.1.6. Interactions between personality and cognitive factors in false memory

In addition to personality factors, cognitive factors also contribute to individual differences in false memory. Many studies have documented various cognitive correlates of individual differences in false memory (Gudjonsson, 2003). In our recent study (Zhu et al., submitted for publication), we found that misinformation false memory was related to a battery of cognitive abilities, including intelligence, perception, memory, and face judgment.

In order to have a comprehensive understanding of individual differences in false memory, it is necessary to examine not only cognitive and personality factors separately and their additive effects, but also their interactions. Thus far, several studies have examined personality characteristics and cognitive abilities simultaneously as predictors of false memory (Liebman et al., 2002; Salthouse & Siedlecki, 2007), but none has examined potential interactions between personality and cognitive factors. Theoretically it is possible that certain combinations of cognitive and personality factors (e.g., low cognitive abilities and high reliance on others) may exacerbate susceptibility to misinformation, whereas certain personality factors (e.g., low trust in others) may mitigate low cognitive abilities' effects on false memory.

2. Method

2.1. Subjects

Subjects were 436 Chinese college students (mean age = 19.83 years, $SD = .96$; 57% female). Written informed consent was obtained from each subject. This study was approved by the IRB of Beijing Normal University, China.

2.2. False memory test

We used Okado and Stark's (2005) misinformation false memory materials. First, subjects saw picture slides depicting an event. Two events were selected from Okado and Stark (2005), each consisting of 50 digital color slides. One event was about a man breaking into a car and stealing things from it, and the other was about a girl's wallet being stolen by a seemingly nice man. Presentation order of the two events was randomized across subjects. Of the 50 slides, 12 were critical slides that would be inaccurately described in the next stage.

Second, after 30 min of filler tasks (to allow for sufficient memory decay), subjects read narrations of the two events that had been presented in picture slides. The narratives consisted of one sentence for each slide image describing the scene depicted in the slide. For each event, 50 sentences were presented, including 12 inaccurate descriptions (misinformation) and 38 accurate descriptions (i.e., consistent with the picture slides).

Third, after 10 min of a filler task (this short filler period was used to maximize the misinformation effect), subjects took the

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