

Research Report

NEGOTIATING FALSE MEMORIES: Interviewer and Rememberer Characteristics Relate to Memory Distortion

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Abstract—*In a recent study, more than half of the participants were led to create a partial or complete false memory for an emotional childhood event (e.g., serious animal attack). Using a subsample from that study, we examined the hypothesis that memory distortion is related to characteristics of interviewers and rememberers. The relations between susceptibility to memory distortion and (a) dissociation (Dissociative Experiences Scale) and (b) personality traits (NEO-Five Factor Inventory) were investigated. Results indicated that participants who exhibited memory distortion scored significantly higher on the dissociative scale than their counterparts who did not exhibit memory distortion. Further, susceptibility to memory distortion was associated with higher extraversion scores in interviewers and lower extraversion scores in participants. This pattern of findings suggests that false memories may derive from a social negotiation between particular interviewers and rememberers.*

Nearly a century ago, Dewey (1920) argued that memories are not literal representations of personal experiences, but instead reflect the characteristics of the rememberer and the remembering context. Observing that aspects of an event are selectively recalled for their present social value, he viewed distortion in memory narratives as resulting from a social psychological process. Dewey's theory was supported by Bartlett's (1932) classic research showing that discussions with other people greatly influence how events are interpreted and recalled. Much research since has corroborated that memory is highly constructive, with important social aspects (e.g., Gudjonsson, 1992; Schacter, 1999).

In addition to illuminating basic memory processes, research on the social nature of memory is relevant to applied interpersonal contexts, such as the courtroom. The reliability of memory for traumatic childhood experiences is a central issue in many legal cases (e.g., Porter & Marxsen, 1998; Read & Connolly, 1999). Although most complainants hold continuous memories for a crime, others report having "recovered" their memories (e.g., Lindsay & Read, 1994). Anecdotal evidence that memories recovered in the context of suggestive interviews are not necessarily accurate arose in the early 1990s (see Loftus, 1993, 1997). Recently, research has indicated that some people can create false memories for entire events (Hyman & Billings, 1998; Hyman, Husband, & Billings, 1995; Loftus & Pickrell, 1995; Pezdek, Finger, & Hodge, 1997). In a recent study (Porter, Yuille, & Lehman, 1999), we established that adults can create false memories for emotional childhood events, such as serious accidents, medical procedures, or animal attacks. Using an "architectural" analogy (Porter, 1998), we suggested that the misinformation clues and the par-

ticipant's imagination were the (cognitive) elements fused by the powerful features of the social situation to create a false memory. An important unresolved issue concerns the specific role that individual differences play within this social context in the creation of false memories (e.g., Hyman & Billings, 1998). Although such factors often have been disregarded in applied memory research (Hosch, 1994), it is noteworthy that many participants in memory-distortion studies have been resistant to misinformation. What discriminates those who are more susceptible from those who are less susceptible to false memories?

The construct of dissociation (separation of attention, thoughts, emotions, and experiences from consciousness, memory, or both) has been proposed as a possible factor in the creation of false memories. Hyman and Billings (1998) found that participants who were more susceptible to implanted memories scored higher on a reliable measure of dissociation (the Dissociative Experiences Scale, DES; Bernstein & Putnam, 1986) than participants who were less susceptible. Other research has found a positive association between dissociation and memory fallibility, including source-monitoring failures (Wilkinson & Hyman, 1998) and susceptibility to misleading questions (Eisen & Carlson, 1998). However, Platt, Lacey, Lobst, and Finkelman (1998) found no relation between DES scores and memory distortion for an autobiographical event. One purpose of the present research was to clarify and extend these findings by investigating the possible association between dissociation and false memories for highly emotional events specifically.

A second purpose of this research was to examine, for the first time, the association between personality and susceptibility to memory distortion. One of the best supported conceptual approaches for describing personality is the Five-Factor Model, which posits that there are five basic personality factors (e.g., Digman, 1990). The NEO Personality Inventory (Costa & McCrae, 1985, 1992), developed to operationalize the model, consistently reveals that five traits represent the major dimensions of personality: (a) Neuroticism refers to the tendency to experience negative emotional states and to view oneself and the world negatively. (b) Extraversion refers to the propensity to experience positive emotional states and to have a positive outlook on life (introversion is conceptualized as the absence of extraversion). Extraverts are talkative, warm, gregarious, and assertive. (c) Openness to experience refers to the extent to which a person is original, has broad interests, and is willing to take risks. (d) Agreeableness refers to the tendency to get along well with others and is associated with traits of trust, modesty, altruism, and compliance. (e) Finally, conscientiousness refers to the extent to which a person is careful, scrupulous, reliable, and persevering. We anticipated that the five-factor approach might elucidate the relations between personality and memory distortion.

Related to susceptibility to distortion is the issue of individual

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differences in the sources of misinformation. No attention has been focused on characteristics of particular interviewers whose questioning leads to false memories. The interactions between an interviewer and a rememberer (e.g., police investigator and witness) are social negotiations that could be influenced by personality. For example, personality could influence the degree of rapport gained within an interview or the rememberer's perceptions of an interviewer's credibility or amicability. In our previous study (Porter et al., 1999), interviewers induced false memories at different rates, even though they had been trained extensively in a common interview script. This heterogeneity permitted an investigation of the relations between interviewers' personality and rates of memory distortion.

METHOD

The present study used a subsample of participants from our previous study (Porter et al., 1999), so a brief summary of the original methodology is provided.

Overview of Porter et al. (1999)

Briefly, in the previous study (Porter et al., 1999), we investigated whether participants could be led to generate false memories for emotional childhood events. Participants' parents received questionnaires asking about six emotional events (serious animal attack, serious indoor accident, serious outdoor accident, getting lost, serious medical procedure, getting injured by another child) that the participant may or may not have experienced between the ages of 4 and 10. In three interviews conducted over 2 weeks, interviewers attempted to elicit a false memory in each participant using guided imagery, context reinstatement, and mild social pressure, and by encouraging repeated attempts to recover the memory. In the first interview, participants were interviewed about a real and a false event, each introduced as true. In Interviews 2 and 3, they were reinterviewed about the false event. If the participant reported remembering the suggested event and incorporated all misinformation into the memory, it was classified as a complete false memory. If only some of the suggested information was recalled or if the participant was unsure whether the memory was real, it was classified as a partial false memory. The final possibility was that no aspects of the false incident were recalled. We found that 26% of participants created a complete false memory, 30% produced a partial false memory, and the remaining 44% experienced no distortion.

Participants

Of the 75 participants who took part in the original study (Porter et al., 1999), 61 (81.3%) were female, and the mean age was 19.2 years ($SD = 1.24$). After the final interview in that study, all participants were asked to complete and return the questionnaires that provided additional data for the present analyses; they were not informed about the specific hypotheses being tested. First, participants were asked to complete and return the dissociation questionnaire (DES). Forty-seven participants (62.7%) returned this questionnaire. Subsequently, participants were mailed a letter requesting that they complete a personality scale, the NEO-Five Factor Inventory (NEO-FFI; Costa & McCrae, 1985, 1992). Of the original 75 participants, 39

(52%) returned the questionnaire. Of the nine original interviewers who were asked to complete the NEO-FFI, seven participated in this study.

Thus, a total of 50 participants and seven interviewers participated in the present study. Thirty-six participants completed both the NEO-FFI and the DES, 3 completed the NEO-FFI only, and 11 completed the DES only. Further, 17 (34%) of the 50 did not experience memory distortion, 20 (40%) experienced a partial false memory, and 13 (26%) experienced a complete false memory. Of the 33 participants who experienced at least partial memory distortion, 29 were female.

Note that of the 36 participants who completed both questionnaires, 3 did not answer all questions on the NEO-FFI. As a result, some of the individual personality-domain scores were not calculated for these participants.

Materials

DES

The DES (Bernstein & Putnam, 1986; Carlson & Putnam, 1993) is a 28-item, self-administered questionnaire measuring tendency toward dissociation. Some items relate to common dissociative experiences (e.g., driving and not recalling the trip), whereas others relate to more severe dissociative experiences (e.g., out-of-body experiences). The DES yields a single score of degree of dissociation. Its reliability, internal consistency, and construct validity have been demonstrated (e.g., Carlson & Putnam, 1993). In clinical contexts, a DES score of 30 or greater suggests the presence of a dissociative disorder (Bernstein & Putnam, 1986; Foa & Rothbaum, 1998).

NEO-FFI

The NEO-FFI (Costa & McCrae, 1985, 1992) is a 60-item version of the NEO Personality Inventory-Revised, with five 12-item scales providing a comprehensive measure of each of the five major personality domains. It is self-administered, and each item is answered on a 5-point scale. Its reliability, validity, and internal consistency are high (Costa & McCrae, 1985, 1992), and its scales have correlations of .75 to .89 with the factors of the NEO Personality Inventory-Revised.

RESULTS

Preliminary Analyses

There were no significant effects of participants' gender, $\chi^2(2, N = 50) = 3.00, p > .05$; age, $F(2, 35) = 0.59, p > .05$; or education, $F(2, 32) = 0.043, p > .05$, on memory distortion. Further, gender of the interviewer had no influence on memory distortion, $\chi^2(2, N = 50) = 5.38, p > .05$.

Dissociation and False Memories

Of the 47 participants who completed the DES, 16 (34.0%) experienced no memory distortion, 18 (38.3%) produced partial false memories, and 13 (27.7%) created complete false memories. Susceptibility was conceptualized as a continuum, and the groups were coded as 1, 2, or 3, for no, partial, or complete false memory, respectively. A one-way analysis of variance (ANOVA) indicated that the mean

DES scores differed significantly between the three groups, $F(2, 44) = 5.47, p < .01$. The DES scores of the partial-false-memory and complete-false-memory groups did not differ, but both were significantly higher than the DES scores of the no-false-memory group (see Table 1). Six participants scored above 30 on the DES, the suggested cutoff for identifying a dissociative disorder, and all of these participants created either a partial or a complete false memory. They were significantly more likely than the other participants to experience memory distortion, $\chi^2(1, N = 47) = 3.55, p < .05$.

Personality Factors in Participants

Of the 39 participants who completed the NEO-FFI, 12 (30.8%) experienced no memory distortion, 14 (35.9%) experienced a partial false memory, and 13 (33.3%) experienced a complete false memory. To examine the association between personality traits and susceptibility to false memories, we conducted ANOVAs with level of susceptibility as the independent measure and the NEO-FFI dimensions as dependent measures. The susceptibility groups differed significantly on extraversion, $F(2, 36) = 3.85, p < .05$. As indicated in Table 1, participants who experienced a complete false memory had significantly lower extraversion scores than those who experienced only a partial false memory. Neither differed from the no-false-memory group, which was more similar to the partial-false-memory group than to the complete-false-memory group. In addition, there was a strong trend for conscientiousness scores to differ, $F(2, 35) = 3.27, p = .051$, with the no-false-memory group scoring highest. Finally, DES scores correlated significantly with three personality dimensions: neuroticism, $r(34) = .40, p < .05$; agreeableness, $r(36) = -.47, p < .01$; and conscientiousness, $r(35) = -.34, p < .05$.

Personality Factors in Interviewers

Despite extensive training and scripted interview procedures, the original nine interviewers differed in the proportion of false memories

they induced, $\chi^2(16, N = 75) = 25.77, p < .05$. Similarly, the seven interviewers in the present study differed in the number of false memories induced, $\chi^2(12, N = 46) = 22.09, p < .05$. To examine whether personality features of interviewers related to participants' susceptibility to false memories, we conducted ANOVAs using the interviewers' NEO-FFI dimension scores and participants' level of susceptibility. Interviewers were categorized as scoring either "low," "medium," or "high" within each of the personality domains (see Costa & McCrae, 1992). Analyses were then conducted with the interviewers' categorized personality-domain scores as the independent variable and participants' degree of susceptibility as the dependent variable. A significant difference was found for interviewers' extraversion scores, $F(2, 43) = 3.08, p < .05$. Tukey comparisons ($p < .05$) indicated that participants' susceptibility level was significantly higher with interviewers who scored high ($M = 2.10, SD = 0.55$) than interviewers who scored low ($M = 1.40, SD = 0.70$) on extraversion, but the levels of susceptibility associated with these groups did not differ from the level of susceptibility associated with interviewers who had extraversion scores in the medium range ($M = 1.94, SD = 0.93$). There was also a trend for participants' higher false memory susceptibility to be associated with higher levels of openness to experience in interviewers, $F(1, 44) = 3.50, p = .07$.

Discriminant Function Analysis

To examine the ability of dissociation and extraversion to discriminate susceptible and nonsusceptible participants, we conducted a discriminant function analysis using DES scores and extraversion scores for participants and interviewers. The analysis yielded a significant function, Wilk's lambda = .64, $\chi^2(3, N = 33) = 13.39, p < .01$. For the ability to discriminate interviews that resulted in memory distortion from those that did not, DES scores had the highest discriminant function coefficient (.77), followed by interviewer extraversion (.52) and rememberer extraversion (.11). Twenty-seven of the 33 (81.8%) cases (with complete data) were correctly classified. Eight of the 10 participants (80%) who experienced no memory distortion and 19 of

Table 1. Mean scores on the Dissociative Experiences Scale (DES) and the NEO-Five Factor Inventory (NEO-FFI)

Measure	Group		
	No false memory	Partial false memory	Complete false memory
DES ^a	10.61 (7.75)	20.62 (10.50)	20.39 (10.78)
NEO-FFI			
Neuroticism	45.75 (11.33)	47.31 (12.62)	51.25 (12.17)
Extraversion ^b	57.17 (10.56)	60.71 (8.91)	49.08 (13.46)
Openness to experience	55.42 (12.04)	62.36 (10.96)	55.54 (10.86)
Agreeableness	58.00 (5.20)	56.43 (14.25)	49.85 (16.27)
Conscientiousness	53.25 (12.01)	42.15 (9.36)	48.77 (11.37)

Note. Standard deviations are given in parentheses.

^aMeans for the partial- and complete-false-memory groups were significantly higher than the mean for the no-false-memory group, $p < .05$.

^bThe mean for the complete-false-memory group was lower than the means for the other two groups, $p < .05$.

the 23 (82.6%) participants who experienced a partial or complete false memory were correctly classified.

DISCUSSION

This study provides strong evidence that individual differences contribute to false memories for emotional events. First, participants who recalled aspects of a false emotional event scored twice as high on the DES as did those who resisted the misinformation. It is possible that memory processes are less reliable in individuals who score high than those who score low on the DES (Spiegel, 1995), leading to heightened suggestibility. Hyman and Billings (1998) theorized that people with dissociative tendencies may have learned to integrate information from external sources into their personal narratives to create coherent narratives. Thus, individuals who frequently experience dissociation may be likely to believe the plausibility of, and personally accept, suggested events from external sources (Gudjonsson, 1992). Second, in addition to scoring higher on the DES than participants who exhibited no memory distortion, participants who were susceptible to complete false memories tended to score lower on extraversion (i.e., be more introverted) than did those who created partial false memories. Complementing this finding, interviewers who were more successful in planting memories scored higher on extraversion than their less successful counterparts. There are several possible explanations for this latter finding, including that compared with introverted interviewers, extraverted interviewers may be more persuasive, confident, or friendly, qualities that could lead to a higher susceptibility in participants. In our view, the most compelling explanation concerns the degree of rapport that the extraverted interviewers were able to establish with rememberers. It is apparent from observing the videotaped interactions that interviewers who scored higher on extraversion were better able than those who scored lower to engage the attention, motivation, and cooperation of participants to "recover" the supposed lost memory.

Overall, the pattern suggests that the provision of misinformation by an interviewer with extraverted traits to a rememberer with introverted traits and dissociative tendencies may be a recipe for a high level of memory distortion. Perhaps an interaction between a gregarious, confident, assertive (but misleading) person and a more introverted, dissociative individual of a subordinate status experiencing difficulty remembering facilitates distortion. The intriguing relations between memory distortion and (a) extraversion in interviewers and (b) introversion in rememberers offers further support for the role of social factors in creating memories. Research is needed to unravel the interaction of the personality characteristics of interviewers and rememberers in a more refined manner. Such research has the potential to improve understanding of the dynamics that culminate in mistaken memory in the context of therapy or a police investigation.

Overall, these findings suggest that memory distortion may result from a social negotiation process contingent on interpersonal communication, as Dewey (1920) theorized. In applied settings, certain "recovered" memories may result when a particular interviewer inadvertently misleads and reinforces inaccurate remembering in a susceptible individual. Our study offers clues to the nature of this process and provides further evidence that memory is fundamentally constructive. Future research should examine the process of false memory creation, paying keen attention to the interaction between particular individuals and specific interviewing approaches.

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