

Denial-Induced Forgetting: False Denials Undermine Memory, But External Denials Undermine Belief[☆]Henry Otgaar^{a,b,*}, Mark L. Howe^{a,b}, Tom Smeets^a, Jianqin Wang^a^a Maastricht University, The Netherlands^b City University London, UK

We examined the mnemonic effects of false denials. In a previous experiment (Otgaar, Howe, Memon, & Wang, 2014), false denials resulted in participants denying that they talked about details with the experimenter when in fact they did. This denial-induced forgetting (DIF) was further examined. In Experiment 1, participants received pictures and their belief and memory for details were tested. In the false denial group, participants had to falsely deny in response to each question. In the external denial group, an experimenter falsely denied to the participants that certain details were present. The control group had to answer the questions honestly. We found evidence for DIF. In Experiment 2, we used a video and again found DIF. Moreover, when the experimenter provided external denials, nonbelieved memory rates increased. Together, our experiments suggest that false denials undermine memory while external denials appear to reduce belief.

Keywords: False denials, False memory, Nonbelieved memory, Belief, Recollection, Memory conformity

According to anecdotal evidence, false denials in the context of the legal field are not all that uncommon. For example, victims of sexual abuse sometimes falsely deny that certain parts of the abuse actually happened. They even sometimes falsely deny that they were the victim of sexual abuse (Lyon, 2007), even when this abuse is documented (Goodman et al., 2003). The main focus of our research is to examine false denials of the former type, that is, for cases in which people witness and remember an event and subsequently *explicitly* state that they did not experience certain parts of that event. That is, our focus is on the mnemonic consequences of false denials.

Work on False Denials

Scientific documentation on false denials is quite limited. Of utmost relevance for the current work is recent experimentation into false denials from our lab (Otgaar, Howe, Memon, & Wang, 2014). In this research, children (6–8- and 10–12-year-olds) and adults were presented with a video about an electrician stealing items at a home. Participants received questions about details of the video and were asked about their memory and belief for the events. Participants were assigned to three groups. For the current experiments, only the false denial group is relevant to discuss. In the false denial group, participants had to falsely deny in response to each of the questions. Specifically, they had to falsely deny that certain details were shown in the video (e.g., “The man did not steal anything”). One week later, participants were specifically asked whether they talked about certain details

with the experimenter and whether they had seen these details on the video. Although false denials had no effect on memory for the video, they did increase participants’ false denials about having talked to the experimenter about the details that were shown in the video. So, forcing participants to falsely deny impaired memory for the *interview*. This latter effect is labeled *denial-induced forgetting (DIF)*.

The Present Research

The goal of the present experiments was two-fold. First, the paradigm used in our original experiment was based on the forced confabulation procedure in which participants were forced to confabulate a response about the content of a *video* they had just watched (Ackil & Zaragoza, 1998). However, to show the robustness of DIF, we examined whether our DIF effect could be replicated when using other stimuli: pictures. This would show that our DIF effect is not a stimulus effect but can be revealed in other situations as well (Vieira & Lane, 2013; for related work with pictures). Another reason for using pictures is that unlike videos, they are static stimuli and are poorer recollected than more dynamic stimuli such as videos (Goldstein, Chance, Hoisington, & Buescher, 1982). Poorer recollection of details means that it is especially difficult to falsely deny picture details and lead to DIF. Hence, if DIF is a strong effect, it should also appear when using pictures.

Second, in our original experiment, we examined the effects of false denials on memory *and* belief. This was done because

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previous memory research has mainly focused on *believed* memories whereas recent research has shown that belief (truth value attributed to an event) and recollection (mental re-experience of an event) are independent constructs (Otgaar, Howe, et al., 2014; Otgaar, Scoboria, & Mazzoni, 2014). This distinction between belief and recollection has led to a new research line showing that on certain occasions, people develop nonbelieved memories. Nonbelieved memories refer to recollections of events for which the belief in the occurrence of those events is undermined (Mazzoni, Scoboria, & Harvey, 2010; Otgaar, Scoboria, & Smeets, 2013). This is interesting as in most instances when people have memories of certain events they also believe that the events occurred. Nonbelieved memories constitute an exception to this situation. In our original experiment, no effect of false denials on nonbelieved memories was found.

Empirical work on nonbelieved memories has revealed that social feedback might lead to the production of nonbelieved memories (Scoboria, Boucher, & Mazzoni, 2014). In the current research, we added an extra group in which the experimenter (falsely) denied to participants that certain details had been presented (=external denial). Recent studies have shown that this form of social pressure (i.e., feedback by others) often leads to decreases in belief while leaving recollection intact (e.g., Mazzoni, Clark, & Nash, 2014). Based on this, false denials might exert different effects on belief and recollection depending on whether false denials are generated internally or externally through social feedback. Thus, we hypothesized that internal false denials would lead to the standard DIF effect, but that external false denials would undermine belief, which then might lead to increased nonbelieved memories rates.

External denials are related to research on omission errors and misinformation in which participants receive misleading information about their memory performance leading to failures of memory about experienced events (Loftus, 2005; Merckelbach, van Roermund, & Candel, 2007). From a theoretical stance, the idea of social feedback (external denials) affecting belief and/or memory comes close to the concept of autobiographical memory being inherently social in nature (e.g., Nelson, 2003). Specifically, work in this area stresses that our (autobiographical) memory is unique because it is shaped by social influences like discussions with friend, parents, etc. To be more specific, recent work shows that autobiographical memory is composed of belief in occurrence (and accuracy) and recollection and, findings show that social feedback is more likely to influence belief and not recollection (e.g., Scoboria et al., 2014).

Experiment 1

Methods

Participants. Using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007), a power analysis with a medium effect size ($f = 0.31$) and power of 0.80 indicated a sample size of 80 participants. We tested 86 participants (mean age = 21.16, $SD = 2.53$, range 18–31; 72 women). Participants were undergraduate students from the Faculty of Psychology and Neuroscience, Maastricht University. Participants received credit points or a financial compensation for their involvement (7.50 euro). The

experiment was approved by the standing ethical committee of the Faculty of Psychology and Neuroscience, Maastricht University.

Materials

Design and procedure. Adults were randomly assigned to the different conditions and were tested in laboratory rooms at the psychology faculty. The experiment contained two sessions separated by a 24-h interval. During the first session, participants received 12 negative and 12 neutral IAPS (International Affective Picture System; Lang, Bradley, & Cuthbert, 2008) pictures,¹ presented in a blocked order in a counterbalanced fashion. Hence, experiment 1 employed a 3 (Condition: False Denial, External Denial, Honest) \times 2 (Emotion: Negative vs. Neutral) mixed model design with the first factor being a between-subjects factor. The pictures were presented using E-Prime on a 17-in. computer screen. Pictures were shown for 5000 ms with 1000 ms inter-stimulus interval. After viewing the pictures, participants received a short distractor task (playing Tetris) lasting for 5 min. Then, participants' baseline belief and memory for details was measured. Participants were asked 10 questions related to details present in the pictures (e.g., What was the woman at the office doing?), and they had to indicate their belief (i.e., whether or not participants believed that a particular detail occurred in the stimuli; 1 = definitely did not happen, 8 = definitely did happen) and memory (1 = no memory at all, 8 = clear and complete memory) for the presented questions. These questions were derived from the Autobiographical Belief and Memory Questionnaire (ABMQ; Scoboria, Mazzoni, Kirsch, & Relyea, 2004). Following this, participants received a 5-min filler task (Bejeweled).

Next, participants were asked 10 open-ended questions. Six questions were already asked during the baseline phase (i.e., true event questions). The remaining 4 questions concerned false details that were not asked during the baseline phase. Participants in the False Denial group ($n = 29$) were instructed to (falsely) deny in response to each question (e.g., "What object was between the blue T-shirt and jeans?"; Answer: "There was no object between the blue T-shirt and jeans"). In the External Denial condition ($n = 29$), participants received the same set of questions, but received social negative feedback to a fixed number of details (i.e., 3 true event questions and 2 false event questions; i.e., half of the six true details and half of the 4 false details) from the experimenter. Specifically, the experimenter suggested that certain details were not present in the picture (e.g., as a response to the participants' answer: "That [specific detail] was not present in the picture; think about it for tomorrow". Of course, the experimenter did not deny all responses of participants as this might make the participant suspicious of the aim of the experiment. Participants in the honest group ($n = 28$) were instructed to provide answers to questions they were absolutely

¹ We used negative and neutral pictures for exploratory reasons. As we did not have any specific predictions concerning the use of these different pictures and because they did not affect DIF, they are not discussed further.

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