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REVIEW ARTICLE



# What science tells us about false and repressed memories

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**ABSTRACT**

What does science tell us about memory phenomena such as false and repressed memories? This issue is highly pressing as incorrect knowledge about these memory phenomena might contribute to egregious effects in the courtroom such as false accusations of abuse. In the current article, we provide a succinct review of the scientific nature of false and repressed memories. We demonstrate that research has shown that about 30% of tested subjects formed false memories of autobiographical experiences. Furthermore, this empirical work has also revealed that such false memories can even be implanted for negative events and events that allegedly occurred repeatedly. Concerning the controversial topic of repressed memories, we show that plausible alternative explanations exist for why people claim to have forgotten traumatic experiences; explanations that do not require special memory mechanisms such as the unconscious blockage of traumatic memories. Finally, we demonstrate that people continue to believe that unconscious repression of traumatic incidents can exist. Disseminating scientifically articulated knowledge on the functioning of memory to contexts such as the courtroom is necessary as to prevent the occurrence of false accusations and miscarriages of justice.

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## The scientific nature of false and repressed memories

The issue of how traumatic experiences are remembered is one of the most contested areas in psychology. An especially controversial aspect of this is the topic of repressed memories. Repressed memory is the idea that traumatic experiences – such as sexual abuse – can be unconsciously blocked for many years such that the individual does not know they were abused, and later recovered in pristine form. The issue of repressed memories has become especially pervasive during the so-called "memory wars"; the ongoing debate between those (often memory scholars) asserting that there is no credible scientific evidence that repressed memories exist and others (often clinicians) claiming that repressed memories do exist. Many scholars have assumed that this debate has been settled, but there is evidence that this debate is far from over (Otgaar et al., 2019).

An important element of the debate concerned situations in which people went to therapy and recovered memories of abuse unknown to them before the therapy started. According to many clinicians, the reason for patients being unaware of an abusive experience was that the memories for that abuse were repressed and that therapy helped recover those memories. However, memory researchers contended that such therapeutic interventions might be inherently suggestive and lead to the creation of false memories of abuse (e.g., Loftus, 1993). Furthermore, another argument was that claims of repressed memories could often be explained by ordinary forgetting (Clancy & McNally, 2005). That is, it is quite normal that people who have experienced a traumatic event will not remember all details of that experience.

Considerable scientific work has been devoted to understanding how false memories are formed and whether repressed memories exist. However, questions have been raised about the ecological validity of false memory research (Blizard & Shaw, 2019). Furthermore, although controversial, the topic of repressed memory continues to be very alive in academic, clinical, and legal circles (for a review, see Otgaar et al., 2019). In the current article, our intention is to set the records straight and provide a brief review of what science tells us about the phenomenon of false and repressed memories. To accomplish this, we will pose several target questions about these phenomena that have frequently been discussed in the literature.

## The science behind false memories

We will start with several key points that have frequently been mentioned in the false memory literature. Specifically, we will discuss several issues such as the prevalence

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of false memory susceptibility and the ecological validity of false memory implantation experiments.

### How susceptible are people to forming false memories?

A pertinent issue in false memory studies is individuals' susceptibility to creating false memories. Importantly, not one answer can be given to this question as different false memory methods have been constructed over the past several decades. For example, false memory production can result from associative processes within the mind (e.g., Deese/Roediger–McDermott false memory task; Deese, 1959; Roediger & McDermott, 1995) or from external suggestions from others (e.g., misinformation paradigm; false memory implantation; Loftus, 2005). For the current article, we will mainly focus on false memories elicited due to suggestions and misinformation because these are often most relevant to the memory wars debate.

One relevant false memory paradigm is the false memory implantation method (e.g., Loftus & Pickrell, 1995). In this method, participants are told to elaborate on events that are suggested to have truly happened to them, where several of the events actually did happen to them, but one event that did not. Using this procedure, researchers have implanted a wide variety of false events, ranging from being lost in shopping mall (Loftus & Pickrell, 1995), to taking a hot air balloon ride (Otgaar et al., 2013; Wade et al., 2002), to being abducted by a UFO (Otgaar et al., 2009), to bumping into a punch bowl at a wedding (Hyman & Billings, 1998). In general, these studies have shown that such suggestions can lead to false autobiographical memories.

When examining the rates at which participants fall prey to these suggestions, studies have found different percentages ranging between 0% (Pezdek et al., 1997) to 70% (Shaw & Porter, 2015; but see also Wade et al., 2018, who found only 30% with different criteria). Wade and colleagues (2002) were one of the first to find that across false memory implantation experiments, the weighted mean percent of false memories was 30%. In a more recent review, Brewin and Andrews (2017) analysed many false memory implantation studies and found full-blown false memories in only 15% of participants. Brewin and Andrews argued that implanting autobiographical false memories is not easy nor common.

An important limitation of Brewin and Andrew's review was that they collapsed all false memory implantation studies and based on this, calculated a mean percent. False memory implantation studies have used various scoring methods to measure false memory formation and therefore calculating mean percentages is not the most precise estimate of false memory susceptibility. Therefore, Scoboria and colleagues (2017) applied a new coding system to eight previous false memory implantation studies. They found that overall 30.4% of reports were classified as false memories and this percentage increased to 46.1% when the suggestion included self-relevant information, imagination procedures, and was not accompanied by a photo.

Collectively, what research on false memory implantation has shown is that a non-trivial percentage of participants (around 30%) can be swayed into remembering a false autobiographical event. So, in contrast to what is sometimes argued (Brewin & Andrews, 2017), false memory implantation can quite commonly occur when the right conditions are met such as probing guided imagery (see also Nash et al., 2017; Otgaar et al., 2017). Real world therapy scenarios that repeat suggestions over time may yield even higher percentages than experiments that often involve just one or two suggestions.

### How ecological valid are false memory implantation studies?

There have been numerous articles in which researchers have debated the ecological validity of false memory experiments (e.g., Ceci et al., 1998; Pezdek & Lam, 2007; Wade et al., 2007). Here we use the classic definition provided by Bronfenbrenner (1977) who stated that "ecological validity refers to the extent to which the environment experienced by the subjects in a scientific investigation has the properties it is supposed or assumed to have by the investigator" (p. 516).

One aim of false memory implantation work is to say something about false memories of traumatic events (e.g., sexual abuse). An important property of false memories of sexual abuse is that these memories often concern emotionally negative events and that such memories sometimes concern repeated events of abuse. Scholars have argued that false memory implantation studies do not meet these criteria. For example, Blizard and Shaw (2019) postulated that false memory researchers have "not been able to implant memories for repeated events, as is often the case with reported childhood sexual abuse" (p. 15). Similarly, Brewin and Andrews (2017) argued that "a challenge for the future will be to demonstrate that it is possible to implant memories of a repeated event" (p. 20).

Concerning the implantation of negative events, research has shown that it is possible to elicit false memories for negative events. For example, Porter and colleagues (1999) succeeded in making people falsely report remembering being bitten by a vicious dog. Also, Shaw and Porter (2015) falsely suggested to participants that they committed a crime (e.g., theft) which led to some apparent false memories. Furthermore, Otgaar et al. (2008) showed that in children, a negative false event (i.e., being accused of copying) was more easily implanted than a neutral false event (i.e., moving to another classroom), a pattern that has been also detected in other false memory paradigms as well (e.g., Bookbinder

& Brainerd, 2016). Apart from these examples, researchers have implanted various other negative events in children and adults such as receiving a rectal enema (Otgaar et al., 2010; Pezdek et al., 1999), a finger getting stuck in a mousetrap (Ceci et al., 1994), and being hospitalised (Hyman et al., 1995). Of course, because of obvious ethical reasons, it is not possible to implant events that are even more stressful and negative. However, negative events that have been implanted share certain similarities with sexual abuse such as that the events can be painful (e.g., rectal enema, mousetrap), shameful (e.g., rectal enema), and emotionally arousing (e.g., hospitalisation).

The issue of whether repeated events can be implanted in memory has recently been addressed by Calado and colleagues (2020). In their experiment, they falsely told adult participants that they lost their cuddling toy several times while control participants were told that they only lost it once. Strikingly, they found that repeated false events were as easily inserted in memory as suggesting that the event happened once. So, this study not only showed that repeated events can be implanted, it raised doubts about the idea that repeated events might be harder to implant than single events.

Taken together, although the negative false events used in false memory implantation are still a far stretch from traumatic events that matter in legal cases (such as sexual abuse), an accumulating body of research has shown that the negative events in research do share some properties with the real life events in question.

## Science and repressed memories

We will discuss two issues of relevance for the debate on the existence of repressed memories. That is, we will describe research on the evidence, or lack of, for repressed memories and the belief in unconscious repressed memories.

### *What does science say about the existence of repressed memories?*

Influenced by psychoanalytic and hypnotic scholars such as Sigmund Freud and Jean-Martin Charcot, the core proposition behind repressed memories is that they act as a defence mechanism when people experience a traumatic event. Here, the idea is that when traumatic experiences are devastating, the mind automatically and unconsciously banishes this experience from conscious awareness. The purported consequence is that people can no longer recollect the experience that triggered it, and are often unaware that they have been abused or traumatised (Loftus, 1993; McNally, 2005; Piper et al., 2008). The unconscious repressed memory is thought to continuously exert a mental and physical toll, through symptoms, and the chief way to reduce this is by recovering the traumatic content (van der Kolk & Fisler, 1995).

Several plausible alternative explanations have been put forward to explain the apparent forgetting of traumatic incidents (see e.g., McNally, 2005). For example, people who are victimised do not want to talk about or may even forget the traumatic experience, but that does not equate with the unconscious repression of trauma. Second, a well-known phenomenon called the forget-it-all-along effect might explain people's claims that they have forgotten their traumatic experiences (Arnold & Lindsay, 2002; Schooler et al., 1997). Specifically, according to this phenomenon, some people who claim to have forgotten sexual abuse all-along may not have as further investigation can reveal that they actually disclosed their memory to others, but have forgotten this disclosure. Third, people might not have experienced the event in question as traumatic at the time it happened and later reinterpreted the event as being abusive in retrospect (McNally & Geraerts, 2009). Finally, a voluminous body of research has shown that contrary to the idea underlying the concept of repressed memories, traumatic experiences are in general well remembered (Goodman-Brown et al., 2003; McKinnon et al., 2015; McNally, 2005; Merckelbach et al., 2003; Wagenaar & Groeneweg, 1990).

Some authors have argued that although unconscious repression of autobiographical memories is unlikely, a conscious type of repression might be a plausible alternative to explain the forgetting of traumatic experiences (Anderson & Green, 2001; Anderson & Hulbert, 2020). Oftentimes, instead of the term repression, the term suppression or motivated forgetting is used in this regard (Anderson & Hanslmayr, 2014). Indeed, studies have shown that when participants are instructed to forget or not think of items on a memory test, subsequent memory retrieval of that information is less accurate (Anderson & Hulbert, 2020; Sahakyan et al., 2013). However, a significant limitation with this work is that most of it has focused exclusively on simple stimuli such as words or pictures and there have been failures to replicate these suppression-induced forgetting experiments (e.g., Bulevich et al., 2006; Wessel et al., 2020). Compared with studies on implanted false memories, the ecological validity of work on suppression is lacking.

So, the idea of unconscious repressed memories runs counter to research on how traumatic experiences are stored and retrieved in memory (Engelhard et al., 2019). Plausible alternative explanations exist for why people sometimes claim not to remember traumatic experiences (e.g., reinterpreting memories) and these explanations need to be discussed in the debate on whether repressed memories exist.

### *Do people believe in the existence of unconscious repressed memories?*

A major question in the debate on the existence of repressed memories is whether people actually believe in the concept of repressed memories. To examine this, researchers have asked participants about their beliefs about repressed memories. For example, Merckelbach

and Wessel (1998) found that 94% ($n = 47$) of students indicated some believe in repressed memories. Magnussen and colleagues (2006) surveyed 2000 Norwegian people from the general population and found that 45% ($n = 900$) endorsed the view that traumatic memories can repressed. Even more recent studies have detected such high endorsement rates. For example, Patihis and colleagues (2014) showed that 81% ($n = 316$) of a U.S. student sample believed that traumatic memories are often repressed.

However, it was not clear whether the surveyed people were expressing a belief in conscious repression (suppression) or the more controversial idea of *unconscious* repressed memories (Brewin et al., 2020). Nevertheless, recent survey work found that many people and professionals do indeed endorse the concept of *unconscious* repression. For example, Houben and colleagues (2020) surveyed eye movement desensitisation and reprocessing (EMDR) therapists as to whether "the mind is capable of unconsciously blocking out memories of traumatic events." In two studies, Houben and colleagues showed that large percentages of small samples of EMDR therapists agreed with this statement (Study 1: 91.6%, $n = 11$; Study 2: 70.7%, $n = 29$).

Furthermore, in a recent study, we specifically asked student participants whether they believed in unconscious repression and found high endorsement rates [Study 1 ($N = 230$): 59.2% ($n = 45$); Study 2 ($N = 79$): 67.1% ($n = 53$)]; Otgaar et al., 2020). Furthermore, in an extended replication of our work (Dodier et al., in press), participants were also asked about their belief in unconscious repression. The authors also found that many people endorsed the belief in unconscious repression, even more so than for deliberate (conscious) suppression (see Dodier et al., in press). Finally, in another study, we specifically asked what people mean when they believe that traumatic memories can be repressed (Otgaar, Wang, Dodier, et al., 2020). We showed that 80.9% ($n = 735$) did indeed mean that such repressed memories are unconscious.

In short, the belief in unconscious repressed memories remains well entrenched in the general population and in some clinical contexts. This belief has been and can be hazardous as it might guide therapists to suggestively dig for hidden memories of abuse in their patients.

## Concluding remarks

In the current article, we have provided a brief overview of the scientific status of false and repressed memories. Research has clearly shown that false memories can be implanted for autobiographical experiences even when these experiences are emotionally negative and concern repeated events (e.g., Calado et al., 2020; Porter et al., 1999). In contrast, scientific evidence on the existence of unconscious repressed memories is lacking and even empirical work on suppression is deficient, and not ecologically matched to entire autobiographical experiences.

The current overview is timely as there are critiques on the scientific work on false memories and unsupported claims concerning the topic of repressed memories (e.g., Brewin et al., 2020). This might be perilous as there are strong indications that the "memory wars" are far from settled, and that this extends to practice (Patihis & Pendergrast, 2019). We will give two concrete examples. First, the term dissociative amnesia has been referred to as an inability to recall autobiographical memories, ones that mostly originate from stressful or traumatic experiences. This term is currently deeply embedded in the DSM-5 (American Psychiatric Association, 2013) and heavily used in psychological and psychiatric quarters (see Otgaar et al., 2019). However, dissociative amnesia shares many similarities with the controversial topic of repressed memory, but likely because of its inclusion in the DSM-5, has not received as much critical scrutiny. Second, in several European countries (e.g., Belgium, France), statutes of limitations to prosecute sexual crimes have been abolished or extended based on the idea that traumatic memories can be blocked for many years (e.g., Dodier & Tomas, 2019). A negative, but unforeseen, consequence of this abolishment is that falsely recovered memories of abuse allegedly taking place decades ago might find their way in court – potentially leading to false accusations and wrongful convictions.

To conclude, the debate on how traumatic experiences affect memory rages on today and memory scholars should be cognizant of the fact that the controversial issues such as repressed memory (whether conscious or unconscious) oftentimes impact other settings outside of academia such as therapeutic settings and the legal arena. Memory scholars have a responsibility to be aware of these sensitivities and when needed, educate interested parties such as the public and legal system about these controversies. By doing so, there is a chance that fewer false memories of abuse will arise in clients, and prevent false accusations sticking in court.

### *Features of memory*

- On average, about 30% of participants form false memories in implantation studies
- Implanted false memories can occur for negative events and for events that allegedly occurred repeatedly
- Plausible alternative explanations exist in place of unconscious repressed memories such as ordinary forgetting and reinterpreting memories
- Many people continue to believe in the controversial idea of unconscious repressed memories

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