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CSI (Crime Scene Induction): Creating False Memories of Committing Crime
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We describe two merging lines of empirical inquiry: entire false memories for autobiographical events and false confessions. A recent study showed that people can be led to remember, and confess to, committing serious crimes that never occurred when confronted with suggestive interview tactics commonly used in police interrogations.

Foundational Research on False Memories
Unlike the traditional conceptualization of memory as a virtual reproduction of the original perception, it has become clear that it is highly malleable and fundamentally reconstructive. Elizabeth Loftus’ seminal work in the 1970s showed that when people are exposed to misinformation after witnessing an event, they frequently incorporate the false details into their memories. For example, witnesses to a car accident gave higher estimates of the offending vehicle’s speed when asked how fast it was going when it ‘smashed into’ versus ‘bumped’ the other car [1]. In the 1990s, this research was extended [2] with the groundbreaking ‘Lost in a Shopping Mall’ study – the first to show that entire false autobiographical memories could be implanted into the minds of approximately a quarter of participants. The basic methodology of this paradigm involves contacting the caregivers of young adults to inquire about events that they had experienced as children and then interviewing the young adults about a true event (or three true events in the case of [2]) and one made-up false event (i.e., getting lost in a shopping mall). Since this work, nearly 20 studies have utilized variations of this paradigm, known as the parental informant paradigm (see Glossary). Researchers have implanted memories for diverse false life events, ranging from positive (e.g., a hot air balloon ride) [3] to negative events that would have been highly stressful had they occurred (e.g., being attacked by a vicious animal) [4].

The degree to which a false memory can be implanted varies; entire false memories are detailed recollections of events that never actually occurred, such as misremembering seeing video footage of the first plane crash on 9/11, whereas partial false memories include elaborations of incorrect details or aspects of an event that did occur [5]. When the content of true and entire false memories is examined, they appear qualitatively and quantitatively similar [6], people observing videos of rememberers recounting true and false memories are unable to differentiate them [8] (which reflects a real world scenario when an allegation is made and jurors must assess veracity), and true and false memories show similar patterns of brain activation [7].

One possible explanation for the induction of false autobiographical memories is derived from an influential theory called fuzzy trace theory (FTT) [8] positing that there are two types of memory processes: verbatim and ‘gist’ memory traces. Verbatim traces are the mental reinstatements of the exact features of the event, whereas gist traces involve semantic aspects or themes of what happened. Because of the reconstructive nature of memory, rememberers often take gist traces and fill in the blanks to generate a coherent and complete sensory personal reality resulting in false memory formation. It appears that three conditions are needed for the generation of entire false memories: (i) the person must be convinced that the event could have happened; (ii) he or she comes to believe that it did happen; and (iii) he or she is helped by the interviewer to interpret thoughts, imagination, and fantasies about the event as memories [9]. Ultimately, a suggested idea becomes a gist memory and false verbatim details are then generated to form a coherent sensory recollection.

Glossary
Coerced-compliant confession: this occurs when an innocent suspect confesses to a crime in response to psychological or physical coercion by the police but is aware that he or she is innocent of the crime.
Coerced-internalized confession: this occurs when an innocent suspect confesses to a crime believing that he or she truly is guilty.
Guided imagery: a procedure used by an interviewer to help the interviewee generate mental images of an event such as a crime, in theory to facilitate recall but in reality can lead to false memories. It involves asking the individual to relax and visualize what the event might have been like while the interviewer tries to re-instate the context, at times with false details (e.g., ‘Picture yourself in [the location]; imagine what it looked like and felt like to be there. Try to remember what the weather/room was like, the people who were there, and what was running through your head.’)
Guilt-presumptive questioning: a widespread approach in police interrogations in which the interrogator is confident (i.e., ‘knows’) that the interviewee is guilty before the interrogation begins and seeks only to generate a confession.
Parental informant paradigm: a research methodology used to implant false memories that involves contacting the caregivers of young adults to inquire about events that they had experienced as children or teenagers and then interviewing the young adults about true and made-up false events.
Rapport-building: this process involves an interviewer building a positive relationship with an interviewee by communicating sympathy, understanding, and respect.


The Nature of False Memories for Crime

Vivid and confident accounts of a crime provided by witnesses or complainants have always played a key role in legal decision-making. The legal implications of the early memory implantation studies quickly became recognized because they challenged the long-standing assumption of memory as a largely reliable process—a major evidentiary foundation of the legal system. This research suggested that honest witnesses could be completely mistaken in their testimony. In fact, the original memory implantation studies were being published at the height of the repressed memory syndrome era during which numerous people were convicted of historical abuse based on (supposedly) repressed memories being recovered in the context of suggestive therapy [10]. While the idea that someone could vividly recall a horrible crime that never happened seemed outlandish to some, ensuing research indicated that people are more easily led to recall highly ‘negative’ false events than other types of situations. Further, research using other paradigms suggested that negative emotion enhances susceptibility to false memories [11]. Largely as a result of this collective work, the recovered memory debate died down and skepticism about the validity of such allegations has grown tremendously in the legal community, to the extent that fewer cases are now reaching the courtroom. Together, this work suggested that people can be led to falsely recall others committing a violent crime. But, can they be led to remember ‘perpetrating’ such an immoral action?

The Nature of False Confessions for Crime

Although largely independent from the false memory literature, a second line of research focused on false confessions—another phenomenon of great importance to the legal system. It was traditionally assumed that unless tortured or deranged, no innocent suspect would say ‘I did it’ if, in fact, he or she had not committed a crime. Yet, around the same time as the first implantation studies, experimental work—since replicated in several studies—showed that participants could be led to falsely confess to minor transgressions such as damaging a computer following an accusation from a confederate [12]. More recent research on real-life, wrongful convictions indicates that false confessions contribute to approximately a quarter of such injustices, and up to an astonishing 63% of the 112 wrongful conviction homicide cases alone [The Innocence Project (2015) DNA Exonerations Nationwide. Retrieved June 15, 2015 from http://www.innocenceproject.org/]. Since false confessions are not being identified as false in so many cases, it would appear that observers such as police and jurors may either disbelieve that they occur or are unable to differentiate them from true confessions, similar to the findings regarding perceptions of true and false memories.

Why would someone possibly falsely confess to a crime? Although ‘coerced’ confined’ confessions in response to police pressure have been assumed to be the most rare (relative to other types of false confessions, such as coerced compliant confessions in which the suspect does not actually believe he or she committed the crime), experimental and anecdotal evidence substantiates that they do occur [12], and no-one knows how frequently they could arise in forensic settings. With this in mind, researchers recently examined the extent to which people could be led to falsely recall and confess to their perpetration of serious crimes.

False Memories for Crime Perpetration and their Consequences

Most would find it hard to believe that people could misremember committing a serious crime, much less with such conviction that they would confess to it. Recently, using the parental informant paradigm, it was demonstrated that young adults with no criminal history could be led to falsely recall and confess to committing a theft, an assault, an assault with a weapon, or even extreme violence (see Box 1 for an example), and ultimately being arrested by the police [13]. Other participants were led to generate false memories for non-criminal, but painful, events such as being injured in an accident, being attacked by an animal, or losing a large amount of money. A majority of the sample—70%—came to recall and confess to crimes that had never occurred, a similar percentage to the number of false, non-criminal memories. Considering the level of detail and sensory components, the false crime memories were strikingly similar to the true memories. This high rate of false memories implantation—which was higher than is typically found with non-criminal events—was likely attributable to the combined effect of multiple suggestive tactics, multiple interviews, and the negative valence of the event. The interview strategies used to generate the false memories mimicked

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**Box 1. Transcript of a Subject’s False Memory [13].**

**Subject:** ‘I remember the two cops. There were two. I know that for sure… I think, like, one was white and one maybe Hispanic… I remember getting in trouble… And I had to like, tell them what I did. And why I did it, and where it happened.’

**Interviewer:** ‘You remember yelling?’

**Subject:** ‘I feel like she called me a slut. And I got ticked off and threw a rock at her. And the reason why I threw a rock at her was because I couldn’t get close to her…’

**Interviewer:** ‘So you threw a rock instead?’

**Subject:** ‘That was bad. That was bad. Bad scene… I can’t believe I did that. I’m a good person.’
those commonly used by police interrogators, such as rapport-building, guilt-presumptive questioning, presenting participants with incontrovertible false evidence, providing some true details, and using leading questions, social pressure, positive and negative feedback, and memory retrieval techniques associated with memory distortion (e.g., guided imagery). This research suggests that most people can readily generate rich false memories for committing a crime when faced with highly suggestive interviewing tactics common to police interrogations.

Concluding Remarks and Future Directions

The highly reconstructive nature of memory can have devastating effects in the criminal justice system. Since the seminal work in the 1970s, an enormous amount of research has repeatedly shown that memory for witnessing a crime can be highly fallible (Box 2), which has led to widespread changes in police interviewing and lineup practices [14]. Conversely, research examining the extent to which ordinary people can be led to falsely remember committing a crime is in its infancy. Considering the role of false confessions in wrongful convictions [The Innocence Project (2015) DNA Exonerations Nationwide. Retrieved June 15, 2015 from http://www.innocenceproject.org/], additional research on this topic is crucial. This is particularly important because confessions lead to easy convictions for prosecutors. As such, no-one can estimate how many individuals are sitting in prison believing they committed a crime of which they are innocent. Future research needs to explore solutions to reduce the likelihood of unintentionally implanting or encouraging false memories for crime, and new interview techniques that prevent false memories and confessions should be developed. Psychological conditions that may contribute to susceptibility to false memories for crime also need to be examined and considered in the context of police interrogations and courtroom decision-making. Further, the advantageous aspects of false memories for certain acts needs to be explored further; that is, the nature of false memories for positive life events, and their implications—such as whether they may help with psychological conditions such as post-traumatic stress disorder—is a fascinating potential avenue of inquiry. Given the potentially deleterious results of false convictions, courts can no longer assume that judges and jurors are able to use their ‘common sense’. We think training in both false memories and confessions should be mandatory for all legal decision-makers.

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References