Received: 2 September 2019 | Revised: 5 May 2020 | Accepted: 17 May 2020
DOI: 10.1002/acp.3697

RESEARCH ARTICLE

WILEY

An experimental investigation of the misinformation effect in crime-related amnesia claims

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Funding information
Fondazione Puglia

Summary

Research suggests that both internal (i.e., lying) and external (i.e., misinformation) factors can affect memory for a crime. We aimed to explore the effects of post-event misinformation on crime-related amnesia claims. We showed participants a mock crime and asked them to either simulate amnesia (simulators) or confess to it (confessors). Next, some participants were provided with misinformation. Finally, all participants were requested to genuinely recollect the crime. Overall, simulators reported less correct information than confessors. Moreover, these two groups were equally vulnerable to misinformation. In addition, exploratory analyses on strategies adopted by simulators revealed that those who previously, mostly omitted information while simulating amnesia exhibited the lowest amount of correct details. Simulators who instead used a mixed strategy disclosed more fabricated memory errors. Findings suggest that legal professionals and jurors should take into account that even offenders, irrespective of confessing or simulating memory loss for a crime, can be susceptible to post-event misinformation.

KEYWORDS

crime-related amnesia, memory errors, misinformation, mock crime, simulating

1 | INTRODUCTION

Approximately 20–30% of defendants claim partial or total amnesia pertaining to their violent acts (Christianson & Merckelbach, 2004; Cima, Merckelbach, Nijman, Knauer, & Hollnack, 2002; Jelicic, 2018; Jelicic & Merckelbach, 2007; Pyszora, Fahy, & Kopelman, 2014). Obstructing police investigations and interfering with legal proceedings are two of the main reasons why offenders claim memory loss for their crimes (Tysse, 2005; Tysse & Hafemeister, 2006). Given such advantages, it is likely that many offenders who claim amnesia for their deeds are actually simulating memory loss (e.g., Jelicic, 2018). Although the exact number is still unknown, there are cases indicating that some defendants eventually admit they have previously simulated amnesia for their crimes (see, for instance, the notorious case of Rudolf Hess; Christianson & Merckelbach, 2004; Jelicic, 2018). In such situations, to what degree can offenders accurately recollect their criminal act?

While several studies demonstrated that when defendants try to deceive legal professionals by simulating amnesia for a crime, their actual recollections for the crime can be impaired (e.g., Mangiulli, Van Oorsouw, Curci, Merckelbach, & Jelicic, 2018; Van Oorsouw & Merckelbach, 2004, 2006), other research indicated that individuals suffer from memory distortion for an event because they received suggestive or misleading post-event information about it from others (e.g., Loftus, 2005; Loftus & Pickrell, 1995; Wylie et al., 2014). In other words, research has shown that both internal and external factors may distort people's memory for past episodes (e.g., Frenda, Nichols, & Loftus, 2011; Loftus, 2005; Mazzoni & Memon, 2003). In the current experiment, we aimed to investigate the interplay between internal (i.e., simulating amnesia) and external factors (i.e., misinformation) on ones' memories for a mock crime.

1.1. | Simulating amnesia in the memory and deception framework

According to the Memory and Deception (MAD) framework (Otgaar & Baker, 2018), there are at least three deceptive strategies that can potentially influence memory in terms of omission and commission errors, placed on a continuum from false denials to fabrication. These deceptive strategies produce different memory outcomes that are also correspondingly placed along a continuum. On the one hand, research has shown that falsely denying certain event-related details during an interview can eventually lead to forget that those details were previously denied (e.g., Otgaar, Howe, Smeets, & Wang, 2016; Otgaar, Romeo, Howe, & Ramakers, 2018; Polage, 2018). On the other hand, fabricating new information has been shown to increase memory error rates at a later stage (e.g., Van Oorsouw & Giesbrecht, 2008), although it does not seem to undermine the gist of correct recollection (e.g., Ackil & Zaragoza, 2011; Chroback & Zaragoza, 2008). Finally, simulating amnesia appears to be located in the middle of this lying-continuum from false denial to fabrication. That is, because simulating amnesia can be exerted in at least two ways—by solely omitting information versus by simultaneously omitting, distorting and introducing new information (Bylin & Christianson, 2002; Mangiulli, Van Oorsouw, et al., 2018; Mangiulli, Lanciano, Van Oorsouw, Jelicic, & Curci, 2019; Otgaar & Baker, 2018)—this deceptive strategy can impair memory for the crime in terms of forgetting, but it might also lead to distortions and/or commission errors over time (e.g., Mangiulli, Van Oorsouw, et al., 2018; Mangiulli, Van Oorsouw, Curci, & Jelicic, 2019; Van Oorsouw & Giesbrecht, 2008). An increasing wave of studies has investigated the effects of simulated crime-related amnesia claims on genuine memory for such events (e.g., Christianson & Bylin, 1999; Mangiulli, Van Oorsouw, et al., 2018; Mangiulli, Lanciano, et al., 2019; Mangiulli, Van Oorsouw, et al., 2019; Romeo, Otgaar, Smeets, Landström, & Jelicic, 2018; Van Oorsouw & Merckelbach, 2004, 2006). For instance, using the classic simulated amnesia for a mock crime procedure, Mangiulli, Van Oorsouw, et al., (2018) exposed participants to a mock crime during a first memory test phase and subsequently asked them to either simulate memory loss or confess to that crime. After a delay of 7 days, during a second memory phase, all participants were requested to truthfully recollect that event. Simulating participants reported fewer correct details than those who were initially asked to confess to the mock crime.

One of the possible explanations for the detrimental mnemonic effect of simulating amnesia has to do with lack of rehearsal (e.g., Bylin & Christianson, 2002; Van Oorsouw & Merckelbach, 2004, 2006). When in the procedure of simulating amnesia for a mock crime, a control group was included (i.e., participants who have to recall the mock crime only during the second memory phase), some authors found that simulating participants disclosed the same amount of information as controls, arguing that simulators did not actively rehearse the mock crime during the first phase of the study (e.g., Bylin & Christianson, 2002). This lack of rehearsal, therefore, would explain why simulators eventually omit more details than confessors during attempts to truthfully recall the mock crime. However, new evidence demonstrates that the memory-undermining effect of simulated amnesia only takes place when simulating participants are compared with confessors. In contrast with previous research (e.g., Bylin & Christianson, 2002; Van Oorsouw & Merckelbach, 2004), recent studies show that simulators had better memory for the mock crime than those in the control group, suggesting that feigning amnesia does lead, to some degree, to actively processing the mock crime (Mangiulli, Van Oorsouw, et al., 2018; Mangiulli, Van Oorsouw, et al., 2019; McWilliams, Goodman, Lyons, Newton, & Avila-Mora, 2014). This means that simulators might still retain some details of the crime despite having feigned memory loss for the event.

Mangiulli, Van Oorsouw, et al., 2019 recently argued that the simulating amnesia effect instead might be better explained by the retrieval-induced forgetting effect (RIF; Anderson, 2003; Anderson, Bjork, & Bjork, 1994). RIF is a phenomenon that occurs when selective retrieval of specific items leads to forgetting of other related items. According to the inhibition-based forgetting theory, forgetting is a consequence of an inhibitory mechanism that supports selective retrieval by suppressing the conflict from related memories (e.g., Anderson, 2003; Levy & Anderson, 2002). Thus, when simulating participants were instructed to strategically omit crucial information (e.g., how the crime occurred) and retrieve other details (e.g., location of the crime) in order to be consistent during the interview (i.e., RIF procedure), they were less likely to report the omitted crucial information than those details that were instead retrieved. Moreover, simulating participants recalled fewer crucial details than simulators who were not subjected to the RIF procedure and confessors (Mangiulli, Van Oorsouw, et al., 2019).

Finally, a third possible explanation for the memory-undermining effect of simulating amnesia involves the source monitoring framework (Johnson, Hashtroudi, & Lindsay, 1993). Specifically, when simulators are requested to feign memory loss for a crime, they also sometimes make up self-generated details which can be confused with the original event. Indeed, simulators' self-generated post-event details often share similar features with the crime stimulus (Mangiulli, Lanciano, et al., 2018). The source confusion generated by this process, therefore, can lead simulating participants to report commission errors in their final statements, amplifying their memory impairment over time (Christianson & Bylin, 1999; Van Oorsouw & Giesbrecht, 2008). Taken together, research on crime-related amnesia suggests that simulation might affect correct recollection when individuals are interviewed to truthfully account for the offence over time.

During investigative interviews with suspects, confrontational and suggestive techniques based on the introduction of new (and possibly inaccurate) information can affect suspects' memory-related statements (i.e., Kassin et al., 2010). Research has pointed out that these techniques can include the presentation of false evidence, for instance, fake reports by the interviewer (e.g., Kassin et al., 2010; Kassin, Bogart, & Kerner, 2012). As such, additional misinformation provided after the crime can interfere with offenders' account for the criminal experience. Thus, this raises the question whether or not misleading post-event information can even have an effect on individuals who initially claimed memory loss for their crime.

1.2. | Misleading post-event information

Over the last four decades research has shown that when people receive misleading information after an event they tend to report that erroneous information in their memory for the original event (e.g., Loftus, Miller, & Burns, 1978; McCloskey & Zaragoza, 1985). This effect is widely known as *misinformation effect* (see for a review Loftus, 2005). In a typical misinformation paradigm, participants witness an event and subsequently are provided with misleading post-event information regarding that event. When memory for the original event is tested, misleading post-event information is often reported in participants' memory reports for that episode (Nichols & Loftus, 2019; Wylie et al., 2014). Takarangi, Parker, and Garry (2006), for instance, showed participants a video of an electrician who commits a burglary while doing some home repairs. After a filler task, participants read some eyewitness police reports about the electrician's activities, containing both real and misleading items. Finally, participants were given a surprise recognition task. Results revealed a large misinformation effect (Cohen's $d > 0.8$; Cohen, 1988). Overall, several replications of such methodology highlighted that a substantial part of individuals are likely to accept misleading post-event information (e.g., Laney & Loftus, 2013; Loftus, 2005).

The source monitoring framework (Johnson et al., 1993) accounts also for the misinformation effect. As argued above, post-event information and the overall meaning of the event sometimes share similar memory characteristics (e.g., perceptual, affective or contextual details). When individuals, therefore, do not properly encode the post-event information's source, they may attribute it to the original source (i.e., source monitoring errors; Belli & Loftus, 1994; Mitchell & Johnson, 2000), thereby wrongly reporting misinformation as pieces of the original experience (Johnson et al., 1993).

1.3. | The present experiment

Based on the literature reported above, it appears that both internal (i.e., simulating amnesia) and external (i.e., misleading post-event information) factors can adversely affect individuals' genuine memory for a crime when they are later asked to come forward with the truth. Although the literature is replete with studies that have extensively examined these factors separately, to our knowledge, no research has been done on combining these factors into one experimental investigation. Investigating this issue is relevant to examine whether such factors have an independent impact on memory or whether they might interact with each other, thereby differentially affecting individuals' memory performance. That is, on the one hand, because some research has shown that simulators might still continue to remember crucial aspects of an experienced event (e.g., Mangiulli, Van Oorsouw, et al., 2018; Mangiulli, Lanciano, et al., 2019; McWilliams et al., 2014), simulators and confessors might evince a similar misinformation effect. However, on the other hand, it could also be the case that because simulators sometimes have a weak memory trace of an event due to lack of rehearsal or RIF (Bylin & Christianson, 2002; Mangiulli, Van Oorsouw, et al., 2019; Van Oorsouw & Merckelbach, 2004), they are unable to detect discrepancies between the original event and post-event information, which would make them more susceptible to misinformation than confessors. The principle of discrepancy detection is relevant to understand the likelihood that an individual can be affected by misleading post-event information. As noticed by Tousignant, Hall, and Loftus (1986), indeed, alterations in genuine recollections for an experienced event are more likely to occur if somebody is not able to deliberately notice such discrepancies. Thus, the main purpose of this experiment was twofold. First, we sought to replicate the memory undermining-effect of simulated amnesia, meaning that simulating participants would perform worse (i.e., less correct information and more errors) than confessors when both groups were asked to genuinely account for a mock crime event. Second, we wanted to explore whether, and to what extent, individuals who previously simulated amnesia for a mock crime were likely to report misleading post-event information when honestly describing the mock crime, thereby showing the misinformation effect.

2 | METHOD

2.1 | Participants and design

Participants were recruited using advertisements and online-enroll systems and eventually rewarded with a course credit. Based on previous research[1] (e.g., Mangiulli, Van Oorsouw, et al., 2018; Mangiulli, Van Oorsouw, et al., 2019; Van Oorsouw & Merckelbach, 2004, 2006), a total of 85 undergraduate students took part in the study (84.7% [$n = 72$] women, $M = 21.22$, $SD = 1.39$). We used a 2 (condition: simulators vs. confessors) × 2 (misinformation induction: yes vs. no) between-subjects design. Participants were more or less evenly distributed over the two groups—simulators ($N = 44$), and confessors ($N = 41$). The dependent variables were participants' (a) correct information, (b) memory errors (i.e., collapsing distortions and fabrication) and (c) misinformation rates. Note that, for our exploratory analyses, we additionally categorized distorted and fabricated memory errors and central and peripheral misinformation scores. The present study was approved by the Ethical committee of the Faculty of Psychology and Neuroscience, Maastricht University (ERCPN number RP2027_2018).

2.2 | Measures

2.2.1 | Mock crime event

We used a mock crime video recorder in point of view (*pov*) perspective[2] that has successfully been applied in previous research (Mangiulli, Van Oorsouw, et al., 2019). Accompanied by background music, the mock crime event (about 3 min) displayed a person who comes home after a hard day's work, and after having dinner at his/her flat, he/she goes to the inner city for some drinks. In the restroom of the last club, the offender has a violent fight with another person. The offender strangles the victim, leaving her dead on the restroom's floor. Finally, the offender runs away from the club, and drives back home.

2.3 | Procedure

The study consisted of two phases [i.e., memory test (T1) and memory re-test phase (T2)], both conducted in a quiet test room at the Faculty of Psychology and Neuroscience, Maastricht University. After providing the experimenter with written informed consent,[3] participants were randomly assigned to one of the two groups. Next, all participants were asked to pay attention to the mock crime video and identify themselves with the character that performed actions in the video (i.e., the offender). After the video presentation, participants were involved in a distractor task for 10 min (i.e., playing Tetris).

2.3.1 | Memory test phase (T1)

After completing the distractor task, simulating participants were requested to pretend to suffer from memory loss for the mock crime. In order to evade responsibility for the crime, simulators were instructed to describe the events, on a free recall sheet, as if they had great difficulties in remembering what occurred.[4] In contrast, participants in the confessor group were asked to collaborate with the police and honestly recollect the criminal experience. All participants were given approximately 20 min to write down their statement. Next, participants were asked to indicate to which degree they identified themselves with the offender[5] on a 5-point scale anchoring from 0 ("*Not at all*") to 4 ("*At all*"). In addition, only simulating amnesia participants were asked about the strategy they used in an attempt to feign memory loss for the mock crime. After that, another distractor task (i.e., a puzzle) was given to participants for about 10 min. Finally, the misinformation induction took place.

2.3.2 | Misinformation phase

In a random fashion, half of the participants (i.e., simulators and confessors) were exposed to a police report that reconstructed what happened during the day of the murder. The report contained 12 misleading post-event information regarding the crime. Of those 12 erroneous details, a separate group of 10 undergraduate students [80% (n = 8) women, M = 20.7, SD = .67] was asked to select 6 peripheral (e.g., "*The offender had a fight with two colleagues at work*" and "*The offender fell asleep on the sofa once got home*"), and 6 central details, more strictly related to the violent crime and the victim (e.g., "*The offender was attacked by the victim*" and "*The victim had blond hair*") (see Data S1 for the entire police report). After reading the report, participants were scheduled for a new session 7 days later. The other half of the participants were not subjected to the misinformation induction and were directly rescheduled for the second memory phase.

2.3.3 | Memory retest phase (T2)

After 1 week, participants returned to the test room for the second memory retest phase. This time, all participants (i.e., simulators and confessors) were requested to honestly report, on the same free recall sheet adopted during T1, as many details as possible about the mock criminal experience. Of importance, simulators no longer feigned memory loss for the mock crime, but had to recollect as much as they could remember about the mock crime. Finally, participants were individually thanked and debriefed.

2.4 | Memory test–retest scoring

The mock crime video was divided into 70 critical information units, based on previous research (Mangiulli, Van Oorsouw, et al., 2019). A critical information unit was defined as a significant fragment of the video relevant for the whole story (e.g., "*I pushed the victim on the wall*"). Participants received 1 point for every correct unit reported (maximum = 70), while half point was assigned for a partial correct answer (e.g., "*I pushed the victim*"). We transformed correct scores into proportions (range = 0–1) by dividing the number of information units correctly reported by each participant by the maximum obtainable score. Furthermore, post-event misleading details presented to participants during the misinformation induction were identified (maximum = 12). Moreover, the number of errors was calculated (i.e., introduction of new fabricated information which was not part of the mock crime event such as "*I called the ambulance afterword*" or distorted information such as "*The victim pushed me back*"). Participants' memory reports were scored by the first author and three trained research assistants who were blind to condition. Inter-rater reliability checks at T1 for correctness (r = .96) and error scores (r = .93) indicated a high level of agreement among independent coders, as well as the inter-rater reliability checks, at T2 for the correctness (r = .95), error (r = .91) and misinformation rates (r = 1.00), respectively.

3 | RESULTS

All data and syntax can be found on the Open Science Framework (https://osf.io/h732g/).

3.1 | Manipulation check on simulating participants' instructions

Two Welch's independent-samples t-tests were run on both correctness and error scores to check whether simulating amnesia participants properly followed the instruction given during the first session (T1). As expected, at T1, simulators (M = .15, 95%CI [.13 .17]) reported less correct information than confessors (M = .32, 95%CI [.29 .35]), t(77.85) = −9.72, p < .001, 95%CI [−.20–.13], d = 2.10. Simultaneously, simulating participants (M = 3.47, 95%CI [2.27 4.68]) committed more errors than confessors at T1 (M = .92, 95%CI [.51 1.33]), t(52.63) = 3.29, p < .001, 95%CI [.83 3.39], d = .86.

3.2 | Correctness scores

Participants' free recall correctness scores were analysed using a 2 (condition: simulators vs. confessors) × 2 (misinformation induction: yes vs. no) factorial ANOVA, performed on the retest memory phase (T2). Only the main effect of condition reached statistical significance, F(1,78) = 17.96, p < .001, η_p^2 = .18. The other main or interaction effects did not reach conventional levels of statistical significance, F_s(1,78) < .38, p > .53. In line with our expectations, simulators (M = .21, 95%CI [.19 .24]) recalled less correct information than people who were instructed to confess to the crime (M = .29, 95%CI [.26 .31]), meaning that simulating amnesia undermined ex-simulators' correct recollection for the mock crime video, p < .001, 95%CI [−.10–.03], d = .96. For completeness' sake, Figure 1 displays participants' correctness scores also divided by misinformation induction (i.e., yes vs. no).

3.3 | Error scores

On error scores, an identical factorial ANOVA to the correctness scores was carried out. The condition by misinformation induction interaction effect was statistically significant, F(1,79) = 4.60, p = .035, η_p^2 = .05, while other main effects were not, F_s(1,79) < .73, p > .39. Simple effect analysis revealed that for simulating participants there was no statistical difference in error rates between those who received misinformation (M = 1.08, 95%CI [.49 1.67]) and those who did not (M = 1.50, 95%CI [.81 2.18]), p = .363, 95%CI [−1.32 .49], d = .29. However, confessors who received misinformation (M = 1.86, 95%CI [1.24 2.48]) were more likely to report errors than those who did not (M = .89, 95%CI [.22 1.56]), p = .037, 95%CI [.05 1.88], d = .67.

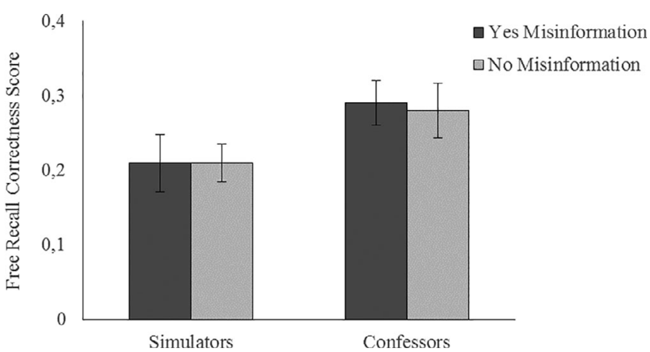

FIGURE 1 Free correctness scores at T2. Error bars represent 95% confidence intervals

3.4 | Misinformation rates

A 2 (condition: simulators vs. confessors) × 2 (misinformation induction: yes vs. no) factorial ANOVA was conducted on misinformation rates at the retest memory phase (T2). Only the main effect of the misinformation induction was statistically significant, F(1,79) = 13.58, p < .001, η_p^2 = .14. Participants who were subjected to the misinformation (N = 46, M = .46, 95%CI [.28 .61]) were more likely to disclose misleading post-event information than those who were not (N = 37, M = .00, 95%CI [−.18 .18]), meaning that our misinformation manipulation was successful, p < .001, 95%CI [.20 .69], d = .85. However, no other main or interaction effects were not, F_s(1,79) < 2.09, p > .15. Indeed, an estimated Bayes factor of BF01 = 0.03 suggested a strong evidence for the null hypothesis, meaning that our data were 1/BF01 = 32.20 times less likely to have occurred under the alternative (i.e., interaction effect) than under the null hypothesis.

In addition, to investigate which type of misleading post-event misinformation was more likely to be reported, we conducted a 2 (condition: simulators vs. confessors) × 2 (type of misinformation: central vs. peripheral) mixed factorial ANOVA with the latter factor as within-subjects variable, executed only on free recall reports (T2) of participants who were involved in the misinformation induction (i.e., $N_{\text{simulators}}$ = 24, and $N_{\text{confessors}}$ = 22). Only the main effect of the type of misinformation was significant F(1,81) = 4.39, p = .039, η_p^2 = .05, while no other main or interaction effects were not, F_s(1,81) < 2.59, p > .11. Overall, participants who received the misleading report were more likely to falsely report peripheral (M = .18, 95%CI [.07 .28]) than central items (M = .07, 95%CI [.01 .12]), p = .042, 95%CI [.00 .37], d = .28.

3.5 | Exploratory analyses

3.5.1 | Strategy adopted by simulators

Among simulating participants (N = 44), 55% (n = 24) revealed omission as the only deceptive strategy used in the attempt to feign amnesia for the mock crime, whereas the 45% (n = 20) claimed having used a mixed strategy for the same purpose. Precisely, 50% (n = 10) of these latter participants used omission combined with distortion, 30% (n = 6) omission and fabrication, while 20% (n = 4) feigned memory loss by simultaneously omitting, distorting and fabricating new information. Based on the deceptive strategies claimed by simulating participants, we categorized those participants in two subgroups, omission simulators (N = 24) and mixed simulators (N = 20) to better examine their memory outcome in terms of correct recollection and errors (i.e., distortions and fabricated information reported).

3.5.2 | Correctness scores

We performed a 3 (condition: omission simulators vs. mixed simulators vs. confessors) × 2 (misinformation induction: yes vs. no) factorial

ANOVA on free recall correctness score at the retest memory phase (T2).[6] Only the main effect of condition reached statistical significance, $F(2,76) = 5.99$, $p = .004$, $\eta_p^2 = .13$, whereas no other main or interaction effects did, $F_s\ (1,76) < .44$, $p > .50$. Interestingly, while no statistical difference was observed between confessors and simulators who used a mixed strategy to feign memory loss for the mock crime ($M = .23$, 95%CI [.19 .26]), $p = .054$, 95%CI [−.00 .11], $d = .02$., omission simulators ($M = .21$, 95%CI [.17 .25]) performed worse than confessors ($M = .28$, 95%CI [.26 .31]), $p = .008$, 95%CI [.01 .12], $d = .09$. Lastly, omission simulators did not statistically differ from simulators who used a mixed strategy in the number of correct details disclosed, $p = 1.00$, 95%CI [−.08 .04], $d = .02$.

3.5.3 | Error scores

We conducted an identical factorial ANOVA on participants' error scores at T2 (omission simulators vs. mixed simulators vs. confessors). No main or interaction effects reached conventional levels of statistical significance, $F_s(2,77) < 2.03$, $p > .13$. However, we further investigated errors claimed by participants at T2 by conducting two 3 (condition: omission simulators vs. mixed simulators vs. confessors) × 2 (misinformation induction: yes vs. no) factorial ANOVAs on both distorted and fabricated errors at T2.

With respect to distortions, only the condition by misinformation induction interaction effect was statistically significant, $F(2,77) = 3.47$, $p = .036$, $\eta_p^2 = .08$, while other main effects were not, $F_s\ (1,77) < .11$, $p > .74$. Simple effects analysis revealed that, among participants who received misleading post-event information, confessors ($M = 1.30$, 95%CI [.90 1.70]) reported more distorted errors than omission simulators ($M = .46$, 95%CI [−.03 .96]), $p = .011$, 95%CI [.20 1.47], $d = .10$. Other differences of our interest were not statistically significant (all $p_s > .05$).

Regarding the introduction of fabricated information, only the main effect of condition was statistically significant, $F(2,77) = 4.41$, $p = .015$, $\eta_p^2 = .10$, whereas no other main or interaction effects were, $F_s\ (1,77) < .51$, $p > .47$. Simulators who used a mixed strategy ($M = .97$, 95%CI [.56 1.38]) did not statistically differ from confessors ($M = .39$, 95%CI [.12 .67]), $p = .07$, 95%CI [−.03 1.18], $d = .46$, but they made more fabricated errors than omission simulators ($M = .13$, 95%CI [−.26 .54]), $p = .016$, 95%CI [.12 1.54], $d = .75$. Finally, no statistical differences were observed between omission simulators and confessors, $p = .88$, 95%CI [−.86 .34], $d = .48$.

3.5.4 | Correlation between error scores and misinformation rate

Finally, we analysed whether, among those who were subjected to the misinformation induction, participants' error scores could be associated with misleading post-event information at T2. Interestingly, we observed that only confessors' errors were positively correlated with misleading information, $r(22) = .580$, $p = .005$, 95%CI [.805 .210], while no statistically significant correlation was found for simulating participants,[7] $r(24) = -.131$, $p = .542$, 95%CI [.288–.507].

4 | DISCUSSION

In the current experiment, we combined two different paradigms (i.e., simulated amnesia and misinformation) to experimentally investigate the effects of misleading post-event information on individuals who were asked to feign memory loss for a mock crime. Our findings reflect, and to some degree extend, those found in the literature with respect to both the simulating amnesia for a mock crime paradigm (e.g., Bylin & Christianson, 2002; Mangiulli, Van Oorsouw, et al., 2018; Mangiulli, Lanciano, et al., 2019, Mangiulli, Van Oorsouw, et al., 2019; Van Oorsouw & Merckelbach, 2006) and misinformation studies (e.g., Loftus et al., 1978; McCloskey & Zaragoza, 1985; Takarangi et al., 2006).

To begin with, we observed the standard memory-undermining effect of simulating amnesia (Mangiulli, Van Oorsouw, et al., 2018; Mangiulli, Lanciano, et al., 2019; Van Oorsouw & Merckelbach, 2004, 2006). Participants who were previously asked to simulate memory loss reported fewer correct details than those who were instructed to confess to the mock crime. In line with recent research (i.e., Mangiulli, Van Oorsouw, et al., 2019; Romeo et al., 2018), possible simulators' memory impairments might be due to retrieval-induced forgetting effects. That is, while retrieving contextual information, simulating participants mostly omitted crucial details during the first memory test. Consequently, those details were more likely to be forgotten when participants were asked to come forward with the truth during the second memory phase. Note that this appears to be supported also by our exploratory analyses, wherein we found that more than half of simulating participants (55%) who only omitted information while simulating memory loss showed a poorer memory performance than confessors over time. Alternatively, these findings can, of course, be explained by lack of rehearsal. More precisely, simulators might have gone over the original crime stimulus to a lesser extent than confessors did during the first memory phase, leading the former to exhibit a poorer memory performance as compared with the latter (e.g., Christianson & Bylin, 1999; Van Oorsouw & Merckelbach, 2004). However, our data restrict us from fully attributing the simulating amnesia effect to such explanation, mainly because we did not include a control group (i.e., participants who are assessed only during the second memory phase). In this regard, recent studies show that simulators report more correct information than controls because they actually remember some aspects of the event (Mangiulli, Van Oorsouw, et al., 2018, Mangiulli, Lanciano, et al., 2019; McWilliams et al., 2014). As a matter of fact, drawing on the cognitive load theory, when lying, individuals should be able to think of their truthful actions and have a good memory for it (DePaulo et al., 2003; Vrij, Fisher, Mann, & Leal, 2008; Vrij, Mann, Leal, & Granhag, 2010). The truth thus becomes difficult to suppress when liars' knowledge about the event is actually still accessible.

Although simulating participants can withhold details for the offence, they are also likely to report distorted and fabricated information in their simulated version of the crime (e.g., Van Oorsouw &

Giesbrecht, 2008; Van Oorsouw & Merckelbach, 2004, 2006). Even though limited by the number of participants included in each cell (i.e., omission simulators, N = 24, vs. mixed simulators, N = 20), our exploratory analyses revealed some interesting pattern of results. That is, while mixed simulators disclosed in their reports more fabricated information than omission simulators, this latter group reported less distortions than confessors. These findings could be interpreted in the light of both lack of rehearsal and source monitoring, which are finely wrapped up in the MAD framework (Otgaar & Baker, 2018). That is, placed in a lying-continuum from false denial to fabrication, simulating amnesia might produce two distinct memory outcomes: when individuals simulate memory loss by only omitting information, few memory errors but more forgetting is set to occur; in contrast, when they simulate amnesia by omitting *and* distorting/fabricating information, more memory errors but less forgetting is set to happen. Still, when collapsing participants' distortions and new fabricated information in one rate (i.e., error scores), overall simulators did not make more errors than confessors regardless of both the strategy used and the misinformation induction.

When providing participants with misleading post-event information, we found the standard misinformation effect (e.g., Loftus et al., 1978; McCloskey & Zaragoza, 1985; Takarangi et al., 2006). To be more precise, when receiving the fictitious police report, participants (i.e., simulators and confessors) were likely to report some of the misleading post-event information into their memory statements, regardless of the instruction received. Indeed, simulators statistically showed a susceptibility to misinformation similar to confessors, suggesting that, irrespective of either lying or confessing to the crime, individuals report erroneous details in their memory accounts if prompted with misleading post-event information. Interestingly, however, we found a correlation between post-event information and memory errors only regarding the confessor group. Confessors' misinformation acceptance, therefore, was somehow related to their memory errors, which was not observed within simulating participants. Drawing on the source-monitoring framework (Johnson et al., 1993), because our misleading police report shared similar content with confessor' original account for the mock crime, perhaps confessors disclosed misleading post-event information in direct proportion to their memory errors. In contrast, although simulators might have confounded the right source of the information, attributing misleading post-event information to the original event just to the same extent confessors did, this was not related with the likelihood of directly reporting also self-generated errors in their final memory reports. Yet, considering the relatively small number of participants in each cell, the correlational analyses should be taken with caution. Furthermore, in line with some studies (e.g., Dalton & Daneman, 2006; Wright & Stroud, 1998), however, it should be noticed that misled participants (i.e., simulators and confessors) mostly reported peripheral rather than central misinformation and that the overall misinformation rate was lower than that shown by prior research in the same field (e.g., Takarangi et al., 2006). That is because perhaps we provided our participants with erroneous post-event information during the first memory phase and they hence were less likely to report them in their final reports. Indeed, in standard research on the misinformation effect (e.g., Loftus, 2005), the misinformation is given just before the final memory test. Alternatively, because our mock crime stimulus was salient *per se*, misled participants were able to remember that, for instance, the victim was unarmed (i.e., original information) thereby rejecting the idea that she held a knife (i.e., *central* misinformation). In other words, misled participants could have been less susceptible to the knife than, for instance, the offender fell asleep on the sofa after committing the murder (i.e., *peripheral* misinformation).

Some limitations of the present experiment need to be mentioned. Our sample composed of psychology students who are in many ways different from individuals who perpetrate serious crimes. Moreover, although our experiment reflects interesting findings, our data need to be treated with some caution due to the number of participants left after the misinformation induction. Given the possibility of overinterpreting effects with relatively small sample sizes, replications of this experiment are needed. Furthermore, using a free recall as a memory measure has not completely revealed possible effects of misinformation on participants' final memory reports over time. That is, in future studies, instead of using free recall as a memory measure, it would be wise to interview participants with a more detailed set of open-ended questions specifically related to different sequences, or parts, of the mock crime. In this way, it would perhaps be possible to ascertain whether participants are more likely to report misleading post-event information when they do not actually remember certain original information of the event.

We aimed to look into possible interactions between offenders who claim memory loss for their deeds and misinformation provided after an event. Our investigation, based on the main findings presented above, might bear implications for the legal field. We stressed the memory-undermining effect of simulated amnesia, which police investigators should take into consideration when interviewing suspects. That is, offenders who initially claim memory loss, by mostly omitting details while interviewed, might not be able to report all crime-related details when eventually they come forward with the truth (e.g., in parole hearing or plea bargaining situations). This is specifically important when the offender and the victim are the sole witnesses of the crime. Relying on offenders' accounts for criminal experiences, in some circumstances, seems to be as vital as relying on witness' and/or victims' statements. Moreover, connecting our data on the eyewitness memory literature (e.g., Loftus, 2005; Loftus, 2019; Zaragoza, Belli, & Payment, 2007), legal professionals and jurors should be aware that the leak of wrong details and the use of doubtful interviewing techniques (e.g., guilt-presumptive and confrontational approaches) might jeopardize defendants' testimony. Our results show that, indeed, additional erroneous post-event information can affect offenders' memory reports irrespective of whether they prior lied or confessed to the crime. In this regard, we suggest that it would be worthwhile to further explore the combination of different factors on memory-related statements for a crime. To us, understanding possible interplays between lying and misinformation would be important from a legal point of view, wherein defendants' memory reports can have a substantial weight in the courtroom.

ACKNOWLEDGEMENTS

This experiment was supported by the scientific and technological research subdivision of Fondazione Puglia, Bari, Italy.

CONFLICT OF INTEREST

All the authors listed in the current manuscript declare that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter discussed in this manuscript.

DATA AVAILABILITY STATEMENT

All data and syntax can be found on the Open Science Framework (https://osf.io/h732g/).

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ENDNOTES

[1] We based our sample size on previous studies on simulated crime-related amnesia for a mock crime that used identical experimental designs and procedures, including a similar number of participants in each condition (e.g., Mangiulli, Van Oorsouw, et al., 2018; Mangiulli, Lanciano, et al., 2019; Van Oorsouw & Merckelbach, 2004, 2006). Furthermore, a sensitivity analysis (i.e., *t*-test, α error probability 0.05, power 0.80, sample size group 1 = 44, sample size group 2 = 41) conducted using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007), revealed that our experiment was able to detect an effect size of *d* = .54.

[2] We used a mock crime video in *pov* perspective to rule out the potential confounding effect caused by the offenders' gender, because it might be problematic requesting female students to identify themselves with a male perpetrator.

[3] We carefully warned all the participants (both in a verbal and written way, that is, informed consent) that (a) they would be exposed to a mock violent crime, (b) they could stop and withdraw at any moment from the experiment and (c) that in case of any distress or discomfort, we would arrange a referral for them to the faculty counseling service. None of our participants experienced discomfort during the experiment nor reported any complaints after the debriefing session

[4] Note that simulators were explicitly asked not to deny the crime, thereby narrowing the simulation instruction toward omissions, distortions and fabrication of new information as possible strategies to be adopted during simulating amnesia for the mock crime.

[5] No statistically significant differences were observed between simulators (M = 2.31, SD = 1.00) and confessors (M = 2.39, SD = .89) regarding their ability to identify themselves with the offender, $t(83)$ = .349, p = .72, 95% CI [−.48 .33], d = .08. In addition, we ran a Mann–Whitney *U* test to check for possible gender differences in our sample size. No statistically significant differences were revealed between women (*Mdn* = 2.0) and men (*Mdn* = 2.0) with respect to the identification with the offender, U = 415.50, z = −.684, p = .494.

[6] In addition, we conducted a factorial ANOVA on participants' misinformation scores. However, we obtained the same pattern of results already displayed while running the main analyses (i.e. without differentiating simulators in two subgroups).

[7] We conducted correlation analyses by also categorizing simulators in the two other subgroups (i.e. omission vs. mixed). No correlations were found between error scores and misleading post-event information with respect to both omission and mixed simulators, $r(15)$ = .082, p = .772, and, $r(8)$ = −.386, p = .346, respectively. Equally, we did not detect any statistically significant correlation when analyzing the relation between distorted and fabricated information with post-event information, irrespective of the condition (all p_s > .05).

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

How to cite this article: Mangiulli I, Otgaar H, Curci A, Jelicic M. An experimental investigation of the misinformation effect in crime-related amnesia claims. *Appl Cognit Psychol*. 2020;1–9. https://doi.org/10.1002/acp.3697