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
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## Practice makes perfect: effects of mere rehearsal on lay judgments of confessions\*

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### ABSTRACT

Informed by individuals wrongfully convicted by confession, and in light of basic research on practice effects on performance, two studies examined the effects of rehearsal on suspects and observers. In Study 1 ( $N=37$ ), participants who were guilty or innocent of a mock crime were incentivized to confess and then improve upon that confession three more times. Overall, guilty suspects' confessions were longer than those of innocents, rehearsal increased statement length in both conditions, and suspects described their rehearsed confessions as easier to give and more believable, and themselves as less nervous. In Study 2, 161 observers watched a single confession from the first study. Results showed that they did not distinguish between true and false confessions; they were biased toward seeing guilt, substantially over-believing false confessions; and rehearsal exacerbated this latter tendency. In the realm of 'practice makes perfect', innocence did not serve as a safeguard.

### ARTICLE HISTORY

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Rehearsed confession;  
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On January 19, 1980, Cathy Trunko's body was found on a sidewalk of Chicago. She had been stabbed three times in the chest. Three days later, at approximately 2:00 am, police arrested a drunk-and-disorderly 19-year-old man named Daniel Andersen. After sixteen hours of physical maltreatment, threats, promises, and presentations of false evidence, Andersen recited an on-camera confession to the Assistant State Attorney.

Andersen's statement was compelling. He went on to recite a chronological story in which he drank heavily at a bar; left alone looking for sex; went home to get a knife, which he tucked into his boot; brought gloves to cover fingerprints; and went to the victim's house. The two talked a bit, and kissed, but she refused his overture and tried to scream, so he stabbed her three times in the chest and tossed the knife behind bushes a block away. On the basis of this confession, Andersen was convicted and

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\*Additional information for this project is available on the Open Science Framework: [https://osf.io/8akxz/?view\\_only=0e9cfaef3385475dbd69ca9686905f50](https://osf.io/8akxz/?view_only=0e9cfaef3385475dbd69ca9686905f50). This article is based on the Master's thesis of Madeleine Dalsklev. This research was presented at the annual meeting of the Society for Personality and Social Psychologists in New Orleans, LA in 2020.

sentenced to prison. Thirty-five years later, DNA testing excluded the alleged murder weapon, the knife police had retrieved before taking Andersen's confession. Andersen's conviction was then vacated, the State's Attorney dismissed the charges, and he was granted a Certificate of Innocence.

In light of these recent developments, it seems remarkable that Andersen had recited a detail-filled narrative in which he reflected on his own motivations, recounted a conversation with the victim, identified times and locations, and supplemented it all with a hand-drawn map. At his 1982 trial, Andersen testified that the detective had created a 'script', that 'we went over it for hours', and that they staged a 'dress rehearsal' before appearing on camera. In fact, Andersen said he was literally groomed for the performance: 'He took me into the bathroom, made me comb my hair, wash up, straighten out my clothes ... they had pizza waiting for me' (Kassin, 2022, p. 152).

Ten years later, in Bronx County, New York, 16-year-old Huwe Burton returned home one day and found his mother, Keziah Burton, a registered nurse, face-down on her bloodied bed, naked from the waist down with her legs hanging off the edge. The contents of her cashless purse had been dumped onto the floor. Burton called 911. Over the next day or two, however, he became a suspect. Then after hours of interrogation, in which promises and threats were made, Burton handwrote a confession. He appeared on camera to repeat that confession to an assistant district attorney.

As the video opened, Burton was seated between a desk and a metal locker. Behind him, an analogue clock displayed the time at 3:05 (a.m.). After he was Mirandized, Burton unleashed an uninterrupted 944-word narrative: He and his mother had an argument the night before, he said, that continued the next morning. When he woke up, Burton said that he was 'stimulated' on drugs and 'didn't really know what I was doing'. He got a knife from the kitchen, his mother tried to hit him, at which point 'I stabbed my mother in the neck. She fell onto the bed ... I tried to make it seem as if it was a rape or something else ... So I removed her bottom garments. And I wrapped a blue telephone cord around her right wrist'.

Burton's videotaped confession would later persuade the Grand Jury that indicted him, the judge who ruled the confession voluntary, and the trial jury that convicted him. Burton was convicted in 1991, released on parole in 2009, and exonerated in 2019. When asked about his confession, he said he concocted a story that detectives helped him script and refine. 'It was totally rehearsed', he said. 'Over and over and over again'. At one point, detectives had even arranged for a 'dry run' (Kassin, 2022, p. 145).

These cases illustrate two troubling patterns often seen in false confessions. The first is that innocent suspects, fully mindful of their innocence, often agree to confess as an act of behavioral compliance because they are told that reciting a believable confession services their best interest. Numerous real life instances thus illustrate that at some breaking point, these suspects had become incentivized and motivated to cooperate. In the infamous Central Park jogger case, for example, exonerees Antron McCray, Kevin Richardson, Raymond Santana, and Korey Wise, all agreed not only to make an admission of guilt but to provide apparently voluntary and detailed statements on camera, believing that they would then be released (see Burns, 2011).

The second troubling pattern is that studies have shown that neither laypeople nor police officers can significantly distinguish between true and false confessions (Honts et al., 2014; Honts et al., 2019; Kassin et al., 2005). These results are not particularly

surprising in light of research in nonforensic domains showing that people in general are poor judges of truth and deception (e.g. DePaulo et al., 2003; Luke, 2019; Vrij et al., 2019). Part of the problem too is that people tend to over believe false confessions, inferring guilt even, at times, when a confession is coerced (e.g. Kassin & Sukel, 1997; Wallace & Kassin, 2012) or contradicted by DNA (Appleby & Kassin, 2016), and even when the confessor is a juvenile (Redlich et al., 2008) or an informant motivated to lie (Wetmore et al., 2014). Content analyses have shown that most proven false confessions also contain non-public crime details that were accurate, details that found their way into innocents' confessions through a process of contamination (Garrett, 2010; 2015; for a firsthand account, see Trainum, 2014; for a laboratory demonstration of the process, see Alceste et al., 2020). Many false confessions also contain declarations of voluntariness, statements of motivation, apologies, and expressions of remorse (Appleby et al., 2013). In short, many false confessions are richly detailed – which is troubling, as vividness is a cue that increases perceptions of credibility (Bell & Loftus, 1989; Johnson, 2006).

The Andersen and Burton stories suggest the possibility of an additional impediment to observers called upon to evaluate confessions: the processes of coaching, repetition, and rehearsal. Their false confessions not only contained accurate details, indicating contamination, but their narratives were also clear, chronological, and coherent. Knowing now that these confessors were innocent, one must question how these statements were constructed.

The popular expression 'Practice makes perfect' describes the phenomenon that repetition improves learning and memory. Hermann Ebbinghaus (1885) introduced this concept (as well as the learning curve and the forgetting curve) in his classic treatise, *Memory: A Contribution to Experimental Psychology*, where he reported on controlled experiments, often involving himself as a subject, showing that the amount of information subjects retain improves as a function of the number of times they review it. Numerous experiments have since demonstrated the effects of rehearsal and 'overlearning'. Through sheer repetition and practice, performance becomes more automatic, fluent, and resistant to distraction (Dougherty & Johnston, 1996) – as demonstrated, for example, in fewer pauses between words and sentences compared to spontaneous narratives (Chawla & Krauss, 1994; for an overview, see Driskell et al., 1992). Indeed, the beneficial effects of deliberate practice have been found for performance in games, music, sports, and other domains (MacNamara et al., 2014). Even deception can improve with practice. In a study using the Sheffield Lie Test, participants who were instructed to lie frequently, compared to those trained to tell the truth, found it easier to lie over time (Van Bockstaele et al., 2012).

While finding that repetition can increase memory and other types of performance, Ebbinghaus and progeny did not examine whether repetition changes the way observers perceive the person who recounts information from the past. From a cognitive load perspective, deception is more effortful and demanding than telling the truth, which makes it harder to produce a fluid oral account (Granhag et al., 2015). But what if someone has practiced a falsehood, making it easier to tell? In a recent study, Cash et al. (2019) recruited participants to describe on camera something that they saw or did – or to make up a story about something they did not actually see or do. By random assignment, participants recounted their true or false story once or three times. Observers later viewed a single story. Results showed that observers were more likely overall to believe practiced

statements compared to once-told statements. Compared to the latter, they also exhibited less discrimination accuracy when the truthful and deceptive statements they viewed had been practiced.

Informed by actual cases, we conducted two studies in which we used a mock crime paradigm to examine the effects of rehearsal on guilty and innocent suspects and then on independent observers tasked with evaluating these suspects and their confessions. In the first study, suspects engaged in a sequence of events constituting a mock crime, or they did not. They were all then incentivized to confess, on camera, which they did four times. In the second study, independent observers viewed a suspect's first, second, third, or fourth statement, after which they indicated whether they believed the confession to be true or false and answered a series of additional questions. (Neither of the studies reported in this article was preregistered. Their data have been made publicly available; additional analyses for both studies are also posted in an online repository.)

## Study 1

### Method

#### Overview

We created a novel mock crime paradigm to manipulate suspects' factual guilt and innocence, after which we instructed them to confess four times, statements we later showed to independent observers. In this study, laboratory participants were randomly assigned to commit or not commit an elaborately sequenced mock crime after which the experimenter instructed them to play the role of a suspect. At first, all participants were instructed to deny involvement in an initial brief interview with a male confederate posing as an investigator. This interview commenced with a standardized accusation (*'Some money has been stolen from [the laboratory room]; I have spoken to some people in the area and you fit the description of the person who stole the money. So at this point, I guess you could say that I'm pretty sure you had something to do with that'*).

Both guilty and innocent participants were next instructed to confess to the mock crime on four successive occasions. First, the interrogator asked them to recite a confession (e.g. *'Tell me everything'*). Second, he coached them to provide a more detailed account of what they did and to explain why and how they felt. Third, he said once again that the statement was not sufficient and needed to be repeated. Fourth, the interrogator told participants that the statement was nearly satisfactory but had to be repeated one more time. All statements were video recorded. Afterward, participants answered questions about the experience.

#### Participants and design

Thirty-seven participants (30 female, 7 male) from a large public university participated in Study 1 in exchange for \$12 ( $M_{age} = 21.62$  years,  $SD = 3.9$ ; 24.3% were first-year students, 13.5% were sophomores, 35.1% were juniors, 27% were seniors). Overall, 48.6% of the participants were Hispanic, 18.9% identified as Asian/Pacific Islander, 16.2% were African-American, and 13.5% were White. We employed a 2 (guilty vs. innocent)  $\times$  4 (confessions: 1, 2, 3, vs. 4) mixed factorial design, with guilt as a randomly assigned between-subjects

factor and confessions as the within-subjects factor. In total, 20 participants were randomly assigned to the innocent condition, 17 to the guilty condition.

### **Procedure**

The primary aim of Study 1 was to obtain stimulus materials for Study 2 in the form of video-recordings of four confession statements, each successively increasing in level of rehearsal. Upon arrival at the lab, participants were greeted in a waiting area by a female experimenter. After providing informed consent, each was randomly assigned to the guilty or innocent condition.

Participants in the guilty condition were handed a document with a series of specific instructions. The experimenter then left them alone in an interior room, where they were instructed to find and retrieve a gold key in a plastic cup filled with various items, find a note hidden in the drawer of a black plastic box, use the gold key to open the rightmost cabinet on a large desk, find a silver briefcase in the cabinet, use the information on the note to unlock the briefcase, sift through various folders in the briefcase, and retrieve an envelope with a \$100 bill. After collecting the money, the guilty participants returned all other items to their previous positions and left the room and gave the cash-filled envelope to the experimenter. Participants in the innocent condition completed a filler task (a Sudoku puzzle) in the same room where the guilty participants committed their highly scripted mock theft.

Next, the experimenter brought the participant to a second room, adjacent to the site of the mock crime, where the remainder of the study would take place. The room was equipped with a one-way mirror, camera, and microphone. In the center of this small room was a table with one chair on either side. The experimenter invited the participant to sit in the chair furthest from the door and read the following instructions from a script:

*You are now going to play the role of a suspect who has been apprehended for a theft that occurred in this building. A security guard is on his way to ask you some questions. Your instructions are to deny your involvement in the theft. Do not make any incriminating statements.*

After ensuring that the participant understood the situation, the experimenter left the room. At that point, the interrogator – a male confederate who was blind to the participant's actual guilt or innocence – entered the room. He introduced himself as a security guard, briefly questioned the participant about their recent whereabouts, and stated that '*... some money has been stolen from that very location (pointing to the adjacent room), and ... you fit the description of the person who stole the money*'. The interrogator then directly accused the participant of having taken the missing money. As per instructions, the participant always denied involvement in the theft, at which point the interrogator commenced a brief interrogation. Using a standardized script, the interrogator told the participant that he already knows what happened, admonished the participant not to lie, and minimized the moral seriousness of the theft (e.g. suggesting it was not planned or malicious but the result of a tough economy). During this process, the interrogator interrupted the participant's objections and denials. This initial interaction was designed to simulate the opening stage of an interrogation in which a suspect is confronted with an accusation and motivated to deny involvement.

Afterward, the interrogator left the room and said to the experimenter, loud enough to be overheard, 'I need to talk to you, this person is not cooperating at all. They are

continuing to deny and this is going to take all day'. The experimenter then re-entered and incentivized the participant to confess to taking the money: *'At this time we would like you to fully cooperate with the security guard. Answer all of his questions in a way that convinces the guard that you committed this theft'*. The experimenter stated that if the participant did not convince the interrogator of their guilt, they would have to return to the lab for another session, this time unpaid. This latter instruction was designed to induce in participants the point at which real suspects often capitulate after a lengthy interrogation and come to believe that it is in their better interest to confess. The interrogator then returned, placed a handheld camera on a mount on the table, and successfully elicited four video confessions from a frontal suspect-only camera perspective. Importantly, the interrogator did not at any point disclose information about the theft so as not to contaminate their knowledge of the crime.

- (1) To elicit a first confession, the interrogator said: *'Okay, so I hear you're ready to cooperate now. Tell me everything. What happened?'*
- (2) In response to this first effort, the interrogator intervened to coach the participant: *'That's not good enough, it's not detailed enough. I need you to tell me the complete story; I need to know what happened in the beginning, I need to know what happened in the middle, and I need to know what happened at the end. Where were you, how did you do it, what did you see? Why did you do this? Are you sorry? Here, take this notepad. I'm going to give you a minute to really think about what you're going to tell me, and when I come back, we're going to do this again'*. The interrogator then turned on the camera and recorded a second confession.
- (3) Following the second confession, the interrogator's feedback took the following form: *'That's better, but it's still not good enough. Tell me again'*. This instruction thus prompted a third iteration of the confession.
- (4) Following this third confession, the interrogator sought a fourth and final confession: *'Okay, this is close. I think you'd better tell me everything just one more time'*.

After this fourth and final confession, the interrogator left the room and the experimenter re-entered and handed the participant a questionnaire to complete about their background and experience during the experiment. Specifically, participants rated on a 1–10 scale (1- not at all, 10- very) how nervous they were; how stressful they found the process; how easy it was to give the first and last confessions; how nervous they were giving the first and last confessions; and how believable they perceived their first and last confessions to be. They were also asked to indicate how many confessions they gave. Participants were then debriefed and paid and asked to provide consent for the experimenters to use the video-recordings for Study 2. All data have been made publicly available on the Open Science Framework and can be accessed at [https://osf.io/8akxz/?view\\_only=0e9cfaef3385475dbd69ca9686905f50](https://osf.io/8akxz/?view_only=0e9cfaef3385475dbd69ca9686905f50).

## Results

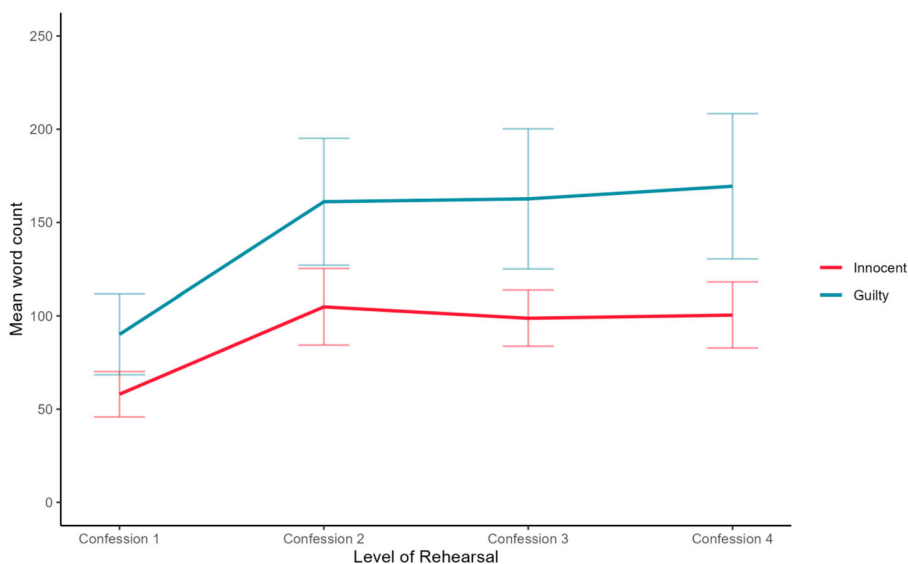
### Confession length

We fit a series of linear mixed effects models predicting the length of the confession (word count). In the first model, we added factual guilt (dummy coded, 0 = innocent, 1 = guilty)

and statement number (level of rehearsal, 0–3) as fixed effects, with random intercepts for each participant. In the second model, to account for nonlinear trends, we added a squared statement number as a fixed effect. In the third model, we added interaction terms for factual guilt with statement number and squared statement number. Likelihood ratio tests indicated that the second model outperformed the first,  $\chi^2(1) = 30.67, p < .0001$ . Although the third significantly outperformed the second,  $\chi^2(2) = 9.98, p = .007$ , neither interaction term coefficient was significantly different from zero,  $ps > .06$ . Thus, we retained and interpreted the simpler second model (details for each examined model are available at [https://osf.io/32ad7?view\\_only=0e9cfaef3385475dbd69ca9686905f50](https://osf.io/32ad7?view_only=0e9cfaef3385475dbd69ca9686905f50)). True confessions were significantly longer than false confessions,  $b = 55.68, 95\% \text{ CI } [25.25, 85.34], t(37) = 3.73, p < .001$ . On average, both true and false confessions got longer with subsequent rehearsal,  $b = 58.02, 95\% \text{ CI } [43.94, 72.1], t(111) = 8.17, p < .0001$ , with diminishing effects after the second confession (i.e. a negative quadratic trend),  $b = -13.49, 95\% \text{ CI } [-17.98, -8.99], t(111) = 5.94, p < .0001$ . However, true confessions remained consistently and significantly longer compared to false confessions (see Figure 1). Over time, true confessions remained longer than false confessions (see Table 1 for cell means).

### Perceptions of the experience

After the session was completed, participants rated on 1–10 point scales their first vs. last confession with regard to (1) how easy each was to produce, (2) how nervous they were while producing them, and (3) how believable they thought the confessions were. We performed 2 (guilty vs. innocent)  $\times$  2 (confession: 1 vs. 4) mixed ANOVA on each of these three ratings. Across measures, the same pattern emerged – a main effect of rehearsal, but no effect of guilt and no interaction.



**Figure 1.** Confession length as a function of guilt.

Note. Error bars are 95% confidence intervals.



**Table 1.** Length of confessions in word counts (Study 1).

Rehearsal level	Condition	<i>M</i>	<i>SD</i>	<i>N</i>
Confession 1	Innocent	78.65	45.41	20
	Guilty	165.29	92.56	17
Confession 2	Innocent	183.70	79.35	20
	Guilty	333.18	176.14	17
Confession 3	Innocent	188.30	74.57	20
	Guilty	376.29	198.25	17
Confession 4	Innocent	200.75	83.92	20
	Guilty	398.12	213.82	17

With regard to the self-reported ease of giving each statement, participants reported that the fourth and most rehearsed confession ( $M = 7.40$ ,  $SD = 2.43$ ) was easier to give than the first ( $M = 4.48$ ,  $SD = 2.64$ ),  $F(1, 35) = 35.54$ ,  $p < .001$ ,  $\eta^2 = .26$ . Interestingly, this significant result did not vary by guilt condition  $F(1, 35) = .051$ ,  $p = .82$ ,  $\eta^2 = .001$ , and there was no interaction between guilt and level of rehearsal on the ease of giving confessions,  $F(1, 35) = 1.06$ ,  $p = .31$ ,  $\eta^2 = .008$ .

On self-reported nervousness, participants also rated themselves as significantly less nervous during the fourth most rehearsed confession ( $M = 5.03$ ,  $SD = 2.88$ ) compared to the first ( $M = 6.54$ ,  $SD = 2.51$ ),  $F(1, 35) = 12.71$ ,  $p = .001$ ,  $\eta^2 = .08$ . Again, we found no effect of guilt on nervousness,  $F(1, 35) = 0.46$ ,  $p = .50$ ,  $\eta^2 = .009$ , and no interaction between rehearsal and guilt,  $F(1, 35) = 2.68$ ,  $p = .11$ ,  $\eta^2 = .017$ .

On perceptions of how believable their confessions were, participants thought their fourth confession ( $M = 7.43$ ,  $SD = 1.99$ ) was more believable than their first ( $M = 3.70$ ,  $SD = 2.37$ ),  $F(1, 35) = 50.32$ ,  $p < .001$ ,  $\eta^2 = .43$ . Once again, we found no significant effect of guilt,  $F(1, 35) = 3.07$ ,  $p = .088$ ,  $\eta^2 = .022$ ; and no interaction,  $F(1, 35) = 0.027$ ,  $p = .87$ ,  $\eta^2 < .001$ .

Finally, we note an exploratory study in which Rizzelli et al. (2021) compared the linguistic patterns of actual true and false confessions and found that the two sets differed in subtle but consistent ways. Although language analysis was not our objective, we provide the materials necessary for other researchers to examine the confessions elicited in Study 1 for linguistic patterns. For the interested reader, we have posted the raw data from the transcripts and some initial analyses: [https://osf.io/8akxz/?view\\_only=0e9cfaef3385475dbd69ca9686905f50](https://osf.io/8akxz/?view_only=0e9cfaef3385475dbd69ca9686905f50).

To sum up, a clear pattern emerged: Participants' rehearsed confessions were longer relative to the first one they gave. On their perceptions of the experience, the effect of rehearsal was strong and significant – regardless of factual guilt and innocence: Participants saw their rehearsed confessions as easier to give, less anxiety-provoking, and more believable.

## Study 2

### Method

#### Overview

With the video recordings from Study 1, we set out to test whether observers' perceptions of true and false confessions varied as a function of rehearsal. We predicted that observers would see rehearsed confessions as more credible and that rehearsal would have a

homogenizing effect on judgments of true and false confessions by increasing the believability of the false confessions.

### Participants

One hundred sixty-one participants ( $M_{age} = 36.10$ ,  $SD = 13.10$ , range = 20–75 years, 53.1% male, 45.7% female) were recruited through Amazon Mechanical Turk (MTurk) and paid \$0.50 for completing the online study. A post-hoc power analysis showed that  $N = 161$  was sufficient to detect a medium effect size (Cohen's  $f = .25$ ) with 75% power. All participants were residents of the United States. Overall, 73.5% were White, 10.5% African-American, 8.6% Asian, 6.3% Hispanic, and 0.6% other/mixed. In terms of highest level of completed education, 41% of the participants had a Bachelor's degree, 33.5% had some college education, 16.1% had only completed high school, 7.5% had a Master's degree, and 1.2% had a PhD.

### Design

MTurk participants were randomly assigned to one of the eight cells of a 2 (guilty vs. innocent)  $\times$  4 (confession: 1, 2, 3, 4) between-subjects factorial design. Each participant viewed one video from Study 1.

### Materials

Participants watched the video-recorded confessions produced in Study 1. Of the 37 mock suspects videotaped in Study 1, eleven were excluded due to technical difficulties with the recording (i.e. low audio or visual quality). In total, therefore, we used 104 confession videos (the first, second, third, and fourth confessions by 13 guilty and 13 innocent suspects); ( $M_{length} = 113.11$  s,  $SD = 65.02$ ,  $Median = 83.50$ ,  $Range = 30-302$ ). (Overall Guilty  $M = 143.75$  sec,  $SD = 74.23$ ; overall innocent  $M = 82.46$  sec,  $SD = 33.36$ ).

After watching a single confession, participants were asked to rate how (1) anxious, (2) believable, (3) blameworthy, (4) knowledgeable, (5) remorseful, (6) serious, and (7) truthful the suspect was; how (8) carefully worded, (9) detailed, and (10) rehearsed the statement was; and (11) the quality of the suspect's memory. All ratings were made on a scale from 1 (not at all) to 10 (extremely).

### Procedure

After providing informed consent, participants read the following:

*After money was reported missing from a university lab, security was called. A student who was nearby and who seemed suspicious was questioned for about an hour. Afterward, the student agreed to give a statement that was video recorded. After giving this statement, the student claimed that they never took the money and was coerced into saying that they did. But the investigator is convinced that the student did it and should be charged. You will now see the 2–3 minute video recording of the whole statement. Afterward, you will be asked for your opinions about it.*

Participants were randomly assigned to watch one of the 104 video-recorded confessions. Afterward, they indicated whether they believed that the student suspect had taken the money (yes or no) and how confident they were in that assessment on a 1–10 point scale. Then they rated each confession on the previously defined measures on a 1–10 scale.

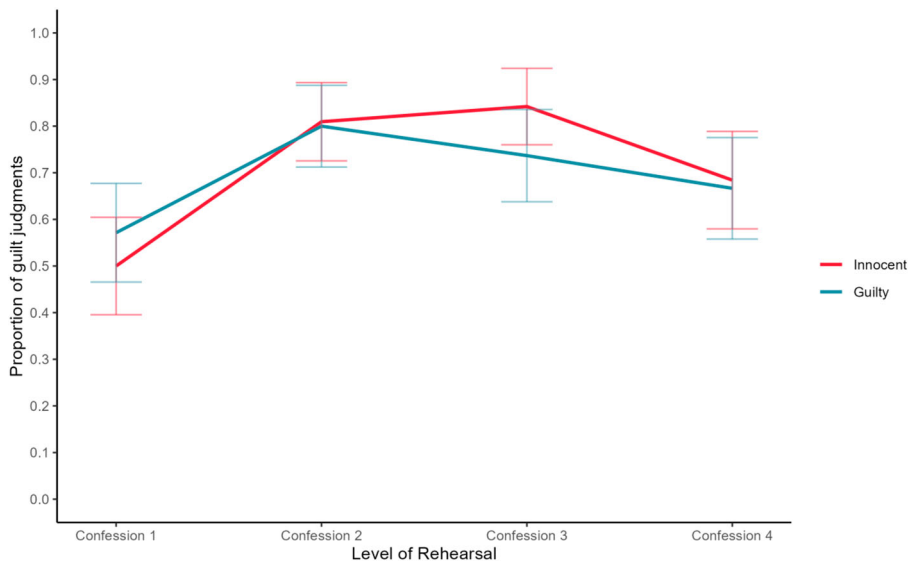
After providing basic demographic information (gender, age, highest level of education completed, race/ethnicity, and country of residence), participants were debriefed and compensated. On average, these sessions lasted from six to seven minutes.

## Results

### Perceptions of guilt

Our primary dependent measure concerned perceptions of whether the suspect who confessed and recanted was guilty or innocent. Participants first estimated whether they thought the suspect had stolen the money or not. Although half of the suspects from Study 1 were innocent, 70.20% ( $n = 113$ ) of observers rated the confessing suspect as guilty vs. 29.80% ( $n = 48$ ) as innocent (see Figure 1). Examining these data by guilt condition, 70.70% of participants in the innocent condition saw the suspect as guilty, compared to 69.60% in the guilty condition. Although it is not surprising that confessions yielded a perception of guilt, it is noteworthy, and consistent with prior research, that participants could not distinguish between true and false confessions,  $\chi^2(1, N = 161) = .024, p = .87$ .

We fit a series of mixed effects binary logistic regression models predicting guilt judgments (0 = innocent, 1 = guilty). In the first model, we added actual guilt (dummy coded, 0 = innocent, 1 = guilty) and rehearsal level (0–3) as fixed effects, with random intercepts for each confession video. In the second model, we added squared rehearsal level as a fixed effect, to account for potential quadratic trends. A likelihood ratio test indicated this addition significantly improved the model,  $\chi^2(1) = 16.40, p < .0001$ . In a third model, we added interaction terms with actual guilt and the linear and quadratic rehearsal level predictors, but these additions did not significantly improve the model,  $\chi^2(2) =$

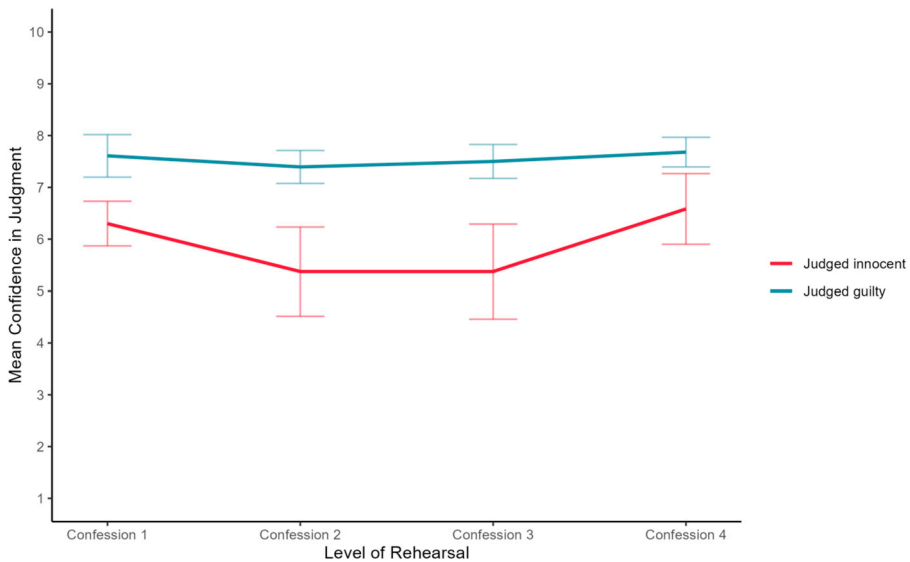


**Figure 2.** Proportion of observers who judge the suspect as guilty as a function of actual guilt and level of rehearsal (Study 2).

Note. Error bars are 95% confidence intervals.

1.76,  $p = .42$ . We therefore interpreted the second model. Actual guilt was not a significant predictor of guilt judgments,  $b = -0.31$ , 95% CI  $[-1.20, 0.58]$ ,  $z = 0.69$ ,  $p = .49$ . However, as rehearsal level increased, participants were more likely to judge a confession as true,  $b = 1.39$ , 95% CI  $[0.77, 2.01]$ ,  $z = 4.39$ ,  $p < .0001$ , and there was a negative quadratic trend across rehearsed confessions,  $b = -0.42$ , 95% CI  $[-0.62, -0.22]$ ,  $z = 4.04$ ,  $p < .0001$ . Figure 2 illustrates this judgment pattern.

In addition to the binary guilt judgment, participants rated how confident they were in their assessment of whether the suspect took the money. We fit a series of mixed effects linear regression models predicting confidence. In the first model, we added actual guilt (dummy coded, 0 = innocent, 1 = guilty), the participant's judgment (0 = innocent, 1 = guilty), and rehearsal level (0–3) as fixed effects, with random intercepts for each confession video. In the second model, we added squared rehearsal level as a fixed effect, to account for potential quadratic trends. A likelihood ratio test indicated this addition significantly improved the model,  $\chi^2(1) = 8.58$ ,  $p < .003$ . In a third model, we added interaction terms with participants' guilt judgments and the linear and quadratic rehearsal level predictors. These additions did not significantly improve the model,  $\chi^2(2) = 5.82$ ,  $p = .05$ , but these two interaction term coefficients were significantly different from zero and appeared to provide a good description of the data (see Figure 3). In this third model, actual guilt did not significantly predict confidence,  $b = -0.27$ , 95% CI  $[-1.08, 0.53]$ ,  $t(24.07) = 0.70$ ,  $p = .49$ . However, when participants judged the confession to be true, they did so with significantly greater confidence,  $b = 0.85$ , 95% CI  $[0.31, 1.39]$ ,  $t(630.95) = 3.09$ ,  $p = .002$ . When participants indicated that a confession was false, there was a shallow u-shaped trend across rehearsal level characterized by a negative coefficient for the linear predictor,  $-1.44$ , 95% CI  $[-2.31, -0.58]$ ,  $t(635.80) = 3.28$ ,  $p = .001$ , and a positive coefficient for the quadratic predictor,  $b = 0.48$ , 95% CI  $[0.19,$



**Figure 3.** Mean confidence as a function of observers' judgment and rehearsal level.

Note. Error bars are 95% confidence intervals.

0.76],  $t(635.98) = 3.26$ ,  $p = .001$ . However, significant interactions between participants' judgment with the linear predictor,  $b = 1.25$ , 95% CI [0.19, 2.31],  $t(633.31) = 2.32$ ,  $p = .021$ , and the quadratic predictor,  $b = -0.36$ , 95% CI [-0.71, -0.02],  $t(634.48) = 2.06$ ,  $p = .040$ , indicated that when participants judged a confession to be true, the trend across rehearsal levels was flat. In short, participants were more confident when they believed a confession was true, and their confidence varied across levels of rehearsal only when they believed a confession was false. The actual veracity of the confession did not significantly influence participants' confidence.

### *Perceptions of the confession*

Participants rated how anxious, believable, blameworthy, knowledgeable, remorseful, serious, truthful, carefully worded, detailed, and rehearsed the confessions/suspect was and the quality of the suspect's memory. In the interest of concision, we focus on four of these measures, chosen a priori – knowledgeable, remorseful, detailed, and rehearsed (see [https://osf.io/8akxz/?view\\_only=0e9cfaef3385475dbd69ca9686905f50](https://osf.io/8akxz/?view_only=0e9cfaef3385475dbd69ca9686905f50) for the results of all other measures).

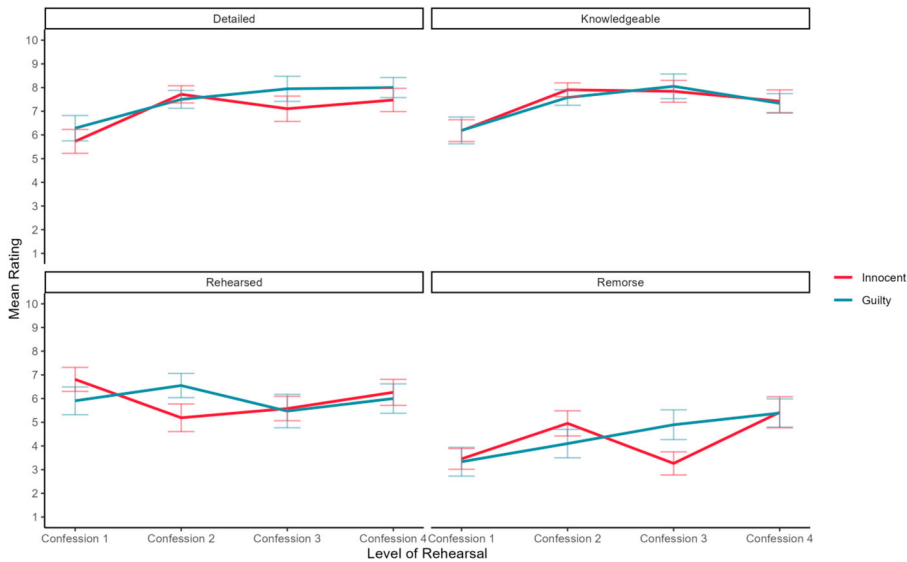
For each of the four measures, we fit a series of linear mixed effects models predicting the rating. In the first model, we added actual guilt (0 = innocent, 1 = guilty) and rehearsal level (0–3) as fixed effects, with random intercepts for each confession video. In a second model, we added a squared rehearsal level variable to account for potential quadratic trends. If a likelihood ratio test indicated adding the quadratic predictor significantly improved the model, in a third model we added interaction terms for actual guilt with the linear and quadratic rehearsal level predictors. If the model comparison did not indicate the quadratic predictor improved the model, we removed the quadratic term and added an interaction between actual guilt and rehearsal level. If adding this interaction offered significant improvement to the model compared to the first model, we retained that model. All likelihood ratio tests are provided in the supplemental materials (see [https://osf.io/32ad7?view\\_only=0e9cfaef3385475dbd69ca9686905f50](https://osf.io/32ad7?view_only=0e9cfaef3385475dbd69ca9686905f50)).

### *Suspect's guilty knowledge*

Actual guilt did not significantly predict perceptions of how much guilty knowledge the suspect had,  $b = 0.09$ , 95% CI [-0.65, 0.83],  $t(26.29) = 0.25$ ,  $p = .81$ . Rehearsal level significantly predicted guilty knowledge ratings,  $b = 1.68$ , 95% CI [1.20, 2.16],  $t(631.85) = 6.88$ ,  $p < .0001$ , with a negative quadratic trend,  $b = -0.46$ , 95% CI [-0.61, -0.31],  $t(631.34) = 5.86$ ,  $p < .0001$ . As can be seen in [Figure 4](#), perceptions of guilty knowledge increased with rehearsal, with little or no further increase beyond the second confession. We did not observe any significant interactions.

### *Suspect's remorse*

Actual guilt did not significantly predict perceptions of how remorseful suspect was,  $b = 0.15$ , 95% CI [-1.03, 1.33],  $t(24.97) = 0.27$ ,  $p = .79$ . Rehearsal level significantly predicted remorse ratings,  $b = 0.57$ , 95% CI [0.4, 0.74],  $t(628.42) = 6.56$ ,  $p < .0001$ . As can be seen in [Figure 4](#), the general trend was for participants to view more rehearsed confessions as more remorseful. We did not observe any significant interactions, and the quadratic rehearsal level variable did not significantly improve the model.



**Figure 4.** Perceptions of confessions by level of rehearsal as a function of actual guilt. Note. Means and SDs are presented in Table 2. Error bars are 95% confidence intervals.

### *Suspect's level of detail*

Actual guilt did not significantly predict perceptions of how detailed the confession was,  $b = 0.55$ , 95% CI  $[-0.15, 1.24]$ ,  $t(23.66) = 1.62$ ,  $p = .12$ . Rehearsal level significantly predicted detail ratings,  $b = 1.29$ , 95% CI  $[0.77, 1.82]$ ,  $t(633.79) = 4.84$ ,  $p < .0001$ , with a negative quadratic trend,  $b = -0.28$ , 95% CI  $[-0.45, -0.12]$ ,  $t(635.11) = 3.32$ ,  $p = .001$ . As can be seen in Figure 4, perceptions of confession detailed increased with rehearsal, with little or no further increase beyond the second confession. We did not observe any significant interactions.

### *Suspect's level of rehearsal*

Actual guilt did not significantly predict perceptions of how rehearsed the first confession seemed,  $b = 0.84$ , 95% CI  $[-0.43, 2.11]$ ,  $t(34.75) = 1.34$ ,  $p = .19$ . For false confessions, there was no significant change in how rehearsed the confessed seemed to be across rehearsal levels,  $b = 0.20$ , 95% CI  $[-0.05, 0.45]$ ,  $t(630.03) = 1.57$ ,  $p = .12$ . However, for true confessions, there was a small trend for confessions to be rated as less rehearsed across rehearsal levels,  $b = -0.39$ , 95% CI  $[-0.73, -0.04]$ ,  $t(625.01) = 2.20$ ,  $p = .029$ . As can be seen in Figure 4, perceptions of how rehearsed confessions were did not vary much across levels of actual rehearsal, and there was a weak tendency for more rehearsed true confessions to be perceived as less rehearsed. The quadratic rehearsal level variable did not significantly improve the model.

## **Discussion**

In light of Daniel Andersen, Huwe Burton, and numerous others wrongfully convicted by confession, the present studies shed light on the effects of rehearsal. In one study, we

**Table 2.** Descriptive statistics for perceptions of confessions (Study 2).

Rating	Actual Guilt	Rehearsal Level	Mean	SD
<i>Detailed</i>	Innocent	1	5.73	2.37
		2	7.71	1.68
		3	7.11	2.33
		4	7.47	2.15
	Guilty	1	6.29	2.47
		2	7.50	1.70
		3	7.95	2.32
		4	8.00	1.81
<i>Knowledgeable</i>	Innocent	1	6.18	2.18
		2	7.90	1.35
		3	7.84	2.02
		4	7.42	2.10
	Guilty	1	6.19	2.61
		2	7.58	1.47
		3	8.05	2.27
		4	7.33	1.74
<i>Rehearsed</i>	Innocent	1	6.81	2.40
		2	5.19	2.68
		3	5.58	2.25
		4	6.26	2.40
	Guilty	1	5.90	2.70
		2	6.55	2.31
		3	5.47	3.09
		4	6.00	2.64
<i>Remorse</i>	Innocent	1	3.45	2.07
		2	4.95	2.45
		3	3.26	2.14
		4	5.42	2.87
	Guilty	1	3.33	2.80
		2	4.10	2.70
		3	4.89	2.75
		4	5.39	2.54

randomly assigned some participants but not others to commit a mock theft. Modeled after actual cases like those we described, in which even innocent suspects were rendered as motivated to confess on camera, expecting that compliance would serve their self-interests, we then incentivized all participant suspects, guilty and innocent alike, to confess to a security officer who then directed them to improve upon that confession three more times. In a second study, online observers watched a confession from a guilty or innocent suspect after which they rendered judgment and answered other related questions.

Study 1 revealed two significant results. First, true confessions were on average twice as long as false confessions – and rehearsal increased statement length in both conditions. Second, both guilty and innocent participants found their last confessions easier to give; they rated themselves as less nervous; and they rated their last statement as more believable. Consistent with basic research indicating that repetition yields performance that is more automatized, fluent, and resistant to distraction across a range of domains (Dougherty & Johnston, 1996; Driskell et al., 1992; MacNamara et al., 2014), including the finding that even deception can improve with practice (Van Bockstaele et al., 2012), suspects perceived their rehearsal as beneficial, making their statement easier to give, less anxiety-provoking, and more believable.

Study 2 examined whether independent observers could distinguish between true and false confessions and whether rehearsal moderated their ability to do so. As in prior

research (Honts et al., 2014; Honts et al., 2019; Kassir et al., 2005), our observers could not generally discriminate between true and false confessions. Indeed, over two thirds of those in the innocent condition saw the suspect as guilty. Of particular interest is that rehearsal had meaningful effects. Objectively, second and subsequent rehearsed confessions were significantly longer as measured by word count compared to first confessions. Consistent with a recent study showing that observers were more likely to believe true or false practiced statements compared to once-told statements (Cash et al., 2019), observers who viewed a rehearsed versus first confession were far more likely to see the suspect as culpable – regardless of actual guilt. Interestingly, although observers rated the rehearsed confessions as more detailed and indicative of guilty knowledge, and the suspects as more remorseful, they did not discern that these statements were more rehearsed.

It is interesting that although rehearsed confessions were judged to be true more frequently than unrehearsed confessions, there were no further increases beyond the second confession. The potentially good news in this pattern of results is that rehearsal yielded diminishing returns with each iteration. Before we can draw that conclusion from our data, however, it is important to note two limitations to the paradigm we used. The first is that our participant suspects were asked to recount simple, brief events compared to the chronological, often highly detailed narratives that comprise confessions to real crimes. It is thus reasonable to expect, and future research should examine, whether third and fourth rehearsal opportunities offer room for greater improvement when task difficulty is increased. A second limitation is that our manipulations were contained within a brief period of time, denying suspects a period of consolidation (e.g. see Bayliss et al., 2015). In light of this limitation, future research should examine whether longer inter-rehearsal intervals would increase the effects of the later rehearsals. That said, the unequivocal bad news in our findings is that the effects on statement length and observers' perceptions were obtained after only a single round of rehearsal. In the numerous cases in which suspects are first induced to confess off-camera, only later to repeat that confession on camera, that second confession is often what serves as the sole basis for judgment.

Although the aforementioned results were obtained within a laboratory, they are concerning for two reasons. First, participant suspects complied with the officer's Milgram-esque prods to confess with relatively little at stake compared to the coercive self-preservative situations that confront wrongfully convicted confessors who fear the consequences of noncompliance. Through promises explicit and implied, innocent suspects like Daniel Anderson, Huwe Burton, the Central Park exonerees, and others often approach their rehearsed confession with a strong motive to please the interrogator and make the statement believable. Second, in order to test the effects of mere practice, we employed a very weak rehearsal manipulation in which the interrogator was blinded as to the details of the mock crime and read from a standardized script to ensure that he could not communicate details that suspects could use to embellish their rehearsed confessions. Analyses of DNA exonerations have shown that 94% of proven false confessions contained accurate facts about the crime – facts that were communicated to suspects (Garrett, 2010, 2015). Hence, the strong effects of rehearsal on observers came about through mere practice, not facilitated by the communication of new information.



One question we did not address, an issue for future research, concerns whether observers would become more discerning if they saw not only the rehearsed confessions but the prodding that elicited those statements. Reinforcing the American Psychology-Law Society Scientific Review Paper (Kassin et al., 2010), perhaps the most glaring policy implication of these results is that all interrogations – and the partial admissions and confessions they produce – should be recorded in their entirety for factfinders to consider alongside the produced final confession. With some thirty states, the District of Columbia, and federal law enforcement agencies now mandating the video recording of custodial interrogations for some or all felonies (though many of these laws are filled with exceptions and loopholes that excuse the failure to record; see Kassin & Thompson, 2019), one wonders if jurors and others who watch the entire process would exhibit less guilt bias and less influence from rehearsed confessions. This is an important empirical question. Prior research does not lead us to make a clearly optimistic prediction. Over a wide range of contexts, research has shown that observers routinely commit the *fundamental attribution error* (Ross, 1977, 2018), or *correspondence bias* (Gilbert & Malone, 1995). That is, they tend to make personal attributions for other people's actions while underestimating the role of situational factors. This phenomenon is manifested in psycho-legal research showing that mock juries and judges infer guilt from confessions – even when they believe that those confessions were coerced (e.g. Kassin & Sukel, 1997; Wallace & Kassin, 2012). This pattern was also recently reported in studies showing that observers infer guilt from a suspect's physical reenactment – even when that reenactment was pressured and guided and even when they observed the process (Rico & Kassin, 2022).

To sum up, three 'headline' findings emerged from our studies: (1) Observers did not distinguish between true and false confessions; (2) they exhibited an overall guilt bias, believing even the false confessions made by suspects in the innocent condition; and (3) even one round of rehearsal was sufficient to exacerbate this latter tendency, increasing the odds that suspects were judged to be guilty. In the realm of 'practice makes perfect', and despite a relatively weak rehearsal manipulation, actual innocence did not serve as a safeguard to these effects.

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