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FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

ALIBI GENERATION AND DISCRIMINABILITY: IMPROVING INNOCENT
SUSPECTS' ACCURACY AND EXAMINING ALIBI DISCRIMINABILITY

A dissertation submitted in partial fulfillment of

the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

PSYCHOLOGY

by

Kureva Pritchard Matuku

2021

To: Dean Michael R. Heithaus
College of Arts, Sciences and Education

This dissertation, written by Kureva Pritchard Matuku, and entitled *Alibi Generation and Discrimination: Improving Innocent Suspects' Accuracy and Examining Alibi Discriminability*, having been approved in respect to style and intellectual content, is referred to you for judgment.

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DEDICATION

This dissertation is dedicated to my grandmother, Esther Matuku.

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ABSTRACT OF THE DISSERTATION
ALIBI GENERATION AND DISCRIMINABILITY: IMPROVING INNOCENT
SUSPECTS' ACCURACY AND EXAMINING ALIBI DISCRIMINABILITY

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The literature on the generation and evaluation of alibis reveals two main findings: (a) Innocent alibi providers are often inaccurate when reporting their alibis, and (b) people are poor at discriminating true from deceptive alibis. Across two experiments, this research adopted a system variables approach to addressing these two problems. Study 1 examined whether a theory-driven intervention involving preparation time with phone access would enhance the accuracy of innocent suspects' alibis. Additionally, Study 1 explored cues to deception that could differentiate honest and deceptive alibi providers. Study 1 conformed to a 2 (Alibi Type: Honest, Deceptive) x 3 (Interview Approach: Preparation with Phone Access, Preparation Only, Control) mixed design. College students ($N = 208$) engaged in a virtual escape room activity at Time 1 and were asked to provide an honest and deceptive alibi. Study 1 results showed that innocent suspects were significantly more likely to generate an accurate alibi if they were allowed either preparation time only (32%), or preparation and phone access (51%), compared to control

(16%). Speech duration emerged as the only significant deception cue: Deceptive alibi providers talked for significantly longer than truthful alibi providers. In Study 2, we examined whether Preparation with Phone Access and Preparation Only also improved evaluators' abilities to discriminate honest from deceptive alibi providers. Study 2 conformed to a 3 (Alibi Type: Honest/accurate; Honest/mistaken; Deceptive) x 3 (Interview Approach: Preparation with Phone Access; Preparation Only, Control) mixed design. MTurk workers ($N = 294$) watched videos of honest/accurate, honest/mistaken, and deceptive alibi providers, and categorized them based on perceived veracity. Overall, classification accuracy was low (especially for honest/mistaken and deceptive alibi providers), and the Interview Approach at Study 1 did not influence Study 2 evaluators' classification accuracy. My research provides support for the schema disconfirmation model, revealing two interventions that can enhance the accuracy of innocent suspects' alibis without concomitantly increasing the believability of deceptive alibis. These results also provide the basis for a standardized procedure for the collection of alibi evidence.

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I. INTRODUCTION

On the afternoon of January 13th, 1999, Woodlawn High School student Hae Min Lee went missing after last being seen in the school parking lot. Following weeks of investigations into her disappearance, Ms. Lee's body was discovered in a Baltimore park. The ensuing homicide investigation identified Adnan Syed, Ms. Lee's ex-boyfriend, as the main suspect. Mr. Syed was later charged and tried on a first degree murder charge. During the trial, Mr. Syed insisted that he could not completely recall his activities and whereabouts on the afternoon that Ms. Lee disappeared. He remembered that he probably attended football practice that day like all other days, and that he had probably spent time in the school library checking his email, which was also the norm. He was however uncertain of the exact timing of these activities. Testifying for the prosecution, Jay Wilds, Mr. Syed's friend, stated that Mr. Syed had shown him Ms. Lee's strangled body, before helping him bury it. Based almost entirely on Mr. Wilds' testimony, Mr. Syed was found guilty of first degree murder on February 25, 2000, and sentenced to life plus 30 years.

In 2014, new evidence in Mr. Syed's case emerged following the release of the podcast *Serial*. Specifically, it emerged that former Woodlawn High student Asia McClain had written letters to Mr. Syed stating that at the time the prosecution claims the murder occurred, Mr. Syed had been in the school library talking to Ms. McClain. It was revealed, however, that this alibi was not investigated by Mr. Syed's attorney at the time of the trial, forming the basis for an appeal (citing ineffective assistance of counsel). In June 2016, after Ms. McClain testified as an alibi witness, a judge granted Mr. Syed a new trial; however, this ruling was overturned by the Maryland Court of Appeals in

March, 2019. In its ruling, the appellate court agreed that Mr. Syed’s counsel was indeed deficient in not producing the alibi at trial, but also ruled that the evidence against him was strong. In November 2019, the Supreme Court declined to review the case.

The case above, popularized in podcast series such as *Serial* and *Undisclosed*, and television series such as HBO’s *The Case Against Adnan Syed*, highlights the complexities of alibis—specifically, how they are generated by suspects, and how they are assessed by the criminal justice system. Two aspects stand out from this trial: First is the fact that Mr. Syed was unable to provide a strong account for his whereabouts on January 13th, 1999. His apparent lack of memory may be perceived by some as being an indication of guilt: a deliberately vague and unverifiable story meant to appear truthful, thereby justifying the subsequent guilty verdict. Conversely, those taking into account that Mr. Syed was required to remember his activities for a period in the distant past may appreciate the difficulty of the memory task, and therefore acknowledge the possibility of Mr. Syed’s innocence.

Second, and closely related to the first, is Ms. McClain’s testimony that she was in the library with Mr. Syed. One could contest (and some did; see Fenton, 2016) the accuracy of Ms. McClain’s story by arguing that she may have mistakenly remembered an interaction that occurred on a different day, especially since Mr. Syed had never made mention of her in his own account of what he believed occurred on that day. These notions unavoidably give rise to some hypothetical considerations: if Mr. Syed were innocent and had accurately remembered his activities and whereabouts on that January afternoon, would he have still been found guilty of Ms. Lee’s murder? Would a strong

and unwavering alibi have been able to overcome the prosecution's version of events? The answers to these hypothetical questions have no clear solutions, just as it is difficult to determine whether Mr. Syed really did murder Ms. Lee. What is however clear from an evidentiary perspective is that a consistent, unwavering alibi would have been easier to investigate, and could have potentially turned up corroborating evidence that may have influenced the trial's outcome. Mr. Syed's case highlights the importance of understanding how people generate both true and false alibis, and stimulates interest in investigating whether guilty and innocent suspects' alibis can be distinguished *ex post facto*.

II. INTRODUCTION TO ALIBI RESEARCH

Researchers have only recently become interested in the psychology of alibis. Burke, Turtle and Olson (2007) described the alibi process in terms of two broad domains: alibi generation and alibi believability. The alibi generation domain involves a story phase, during which a suspect produces a narrative of their whereabouts and activities for the critical time during which a crime took place. The story phase is followed by a validation phase involving attempts to uncover evidence that either supports or disproves the alibi. The believability domain centers on how different evaluators (e.g., judges, detectives, and jurors) examine the believability of the alibi story and corroborating evidence, thereby making judgments about whether an alibi provider is innocent or guilty. Because of the obvious psychological difference between the generation and believability domains, this distinction is maintained in the current manuscript.

Alibi Generation

The alibi process begins with a potential suspect providing an account of their whereabouts at the time in question. How individuals go about generating their story differs depending on whether they are innocent or guilty.

Guilty Suspects

The literature on alibis generated by guilty suspects overlaps substantially with the deception detection literature, particularly because guilty suspects have to lie to generate an alibi. The lies told by guilty suspects may be unverifiable (e.g., “I was home alone”), may involve them reporting activities that were engaged in at a different time, or may be a completely novel fabrication—all in an effort to avoid suspicion (Charman et al., 2019). Investigators therefore have to determine whether an alibi is true (i.e., the suspect is innocent) or is false (i.e., the suspect is guilty, or is innocent but mistaken).

Unfortunately, detecting alibis provided by guilty suspects is a difficult task (Culhane et al., 2013; Evans et al., 2013). The corpus of the deception detection literature has similarly established that people are poor at discriminating between truths and lies, with performance rarely exceeding chance levels (e.g., 54%; Bond & DePaulo, 2006). Poor performance therefore means that some guilty suspects may evade capture because of a failure to detect their lies. Consequently, a leading objective in research involving guilty suspects is to examine techniques to better identify deceptive alibis.

Innocent Suspects

Alibi researchers have primarily focused on how innocent suspects generate alibis. At its most basic level, alibi generation for innocent suspect is a memory test: individuals have to remember where they were and what they were doing at the time a crime was occurring. On the basis of lay beliefs about how memory works (e.g., that memory works like a video camera; Simons & Chabris, 2011), most people would endorse the idea that innocent suspects should be able to remember their whereabouts for a time in the past. However, memory for past events, and for alibis, is not always perfect.

Whereas eyewitnesses (who also have to remember details about a time in the past) have the memorial advantage of experiencing a distinctive, potentially emotional event, innocent alibi providers often have to recall their whereabouts and activities for a period that was not especially memorable. Innocent suspects therefore have to provide an account for a period they were not likely to even encode in memory (Crozier et al., 2017). It is therefore not surprising that alibis generated by innocent suspects are often found to be inaccurate (e.g., Culhane et al., 2008; Olson & Charman, 2012).

Using various approaches such as self-report (Culhane et al., 2008), and staged events (e.g., Leins & Charman, 2016), researchers have noted that when asked to provide an account of their whereabouts in the past, most innocent suspects are inaccurate and often have to later correct their initial alibi. Even when they are accurate, innocent suspects often fail to produce physical evidence to support their story (Culhane et al., 2008). Given these bleak findings regarding alibi generation performance, how such alibis are evaluated for believability becomes especially relevant.

Alibi Believability

When suspects provide alibis, their stories are not taken at face value: they are investigated and evaluated for their believability. The majority of alibi research has focused on the believability domain, examining various factors that influence alibi believability. For instance, Olson and Wells (2004) proposed an alibi taxonomy to assess what makes a believable alibi. The alibi taxonomy distinguished between physical evidence (e.g., receipts and surveillance footage) and person evidence (e.g., corroborating testimony from a friend or co-worker).

Olson and Wells (2004) proposed that the perceived strength of physical evidence varies as a function of its perceived ease of fabrication—a subjective evaluation of how easily an alibi provider would be able to manufacture or orchestrate the evidence. For instance, a cash receipt from a convenience store would be perceived as easy to fabricate because the receipt does not specify who made a purchase and it could have been borrowed from someone else, and should therefore be perceived as relatively weak. However, timestamped surveillance footage would be perceived as difficult to manufacture, and should therefore be perceived as relatively strong.

In terms of person evidence, the alibi taxonomy distinguishes three kinds of alibi corroborators (Olson & Wells, 2004). Motivated familiar others are those corroborators who are motivated to lie for the suspect (e.g., one's spouse or grandmother) and are therefore less likely to be believed. Inconveniently for innocent suspects, these individuals who are least likely to be believed also tend to be those with whom suspects spend the most time (Olson & Charman, 2012). Unmotivated familiar others are those

corroborators who are familiar with the suspect, but who are not motivated to lie for the suspect, such as one's work supervisor or spin class instructor. These individuals should be the most believable because they have less motivation to lie for the suspect but are also familiar with the suspect so are less likely to be mistaken. Finally, unfamiliar others are those corroborators who are not familiar with the suspect (e.g., a bartender or a rideshare co-passenger). Although these corroborators are not motivated to lie for the suspect, they are also more likely to be mistaken, with past research showing that memory for strangers is poor (Charman et al., 2017).

The alibi taxonomy has been influential in understanding various findings in the alibi literature. For instance, Culhane et al. (2008) found that 84% of innocent alibi providers reported family members or close friends as alibi witnesses—individuals who are least likely to be believed according to the taxonomy. Olson and Charman (2012) also found that the majority of their sample of innocent alibi providers reported no or weak physical and person evidence.

Consideration of the landscape of research from the generation and believability domains reveals two main findings regarding innocent suspects. First, innocent alibi providers are often inaccurate when remembering their whereabouts for a time in the past (e.g., Culhane et al., 2008). Second, innocent alibi providers often produce alibis supported by weak evidence, thereby undermining their believability (e.g., Dysart & Strange, 2012). Innocent suspects' alibis are therefore vulnerable during investigations and those suspects may be at risk for wrongful convictions. An analysis of exoneration cases found that about 25% of cases involved weak or no alibi evidence, and this

contributing factor was second only to mistaken eyewitness identifications (Burke et al., 2007). These statistics underscore the need for interventions to help innocent suspects be more accurate when generating alibis, and to help make those alibis more believable.

Furthermore, because deceptive alibis are difficult to detect, additional research is required to improve the discrimination of innocent and guilty alibi providers. Ultimately, the current research aims to address these challenges within the alibi field. To inform new research in the area, we propose a framework to systematically examine the problems specific to the alibi context.

III. THE TRIPARTITE ALIBI FRAMEWORK

It is important to note that, in contrast to the eyewitness literature—which is concerned with dichotomously classifying witnesses as accurate or mistaken—and the deception detection literature—which is concerned with dichotomously classifying suspects as liars or truth tellers—the phenomenology of alibis reveals three types of alibi providers: (a) Honest/accurate alibi providers (i.e., innocent individuals who provide a correct alibi); (b) Honest/mistaken alibi providers (i.e., innocent individuals who mistakenly report an incorrect alibi); and (c) Deceptive alibi providers (i.e., guilty suspects who intentionally provide an incorrect alibi). These distinct alibi types constitute what we propose as the Tripartite Alibi Framework (see Figure 1). The framework describes how the three types of alibi providers relate to each other. Specifically, honest/accurate and honest/mistaken alibi providers share a similar alibi generation process in that they both engage in an autobiographical memory task to remember where they were at the time a crime was taking place. The main difference between these two

alibi providers is that they arrive at different outcomes. For instance, an honest/accurate alibi provider may produce evidence that, following verification, will support the initial alibi. The alibi content is therefore accurate and verifiable (see Nahari & Vrij, 2014).

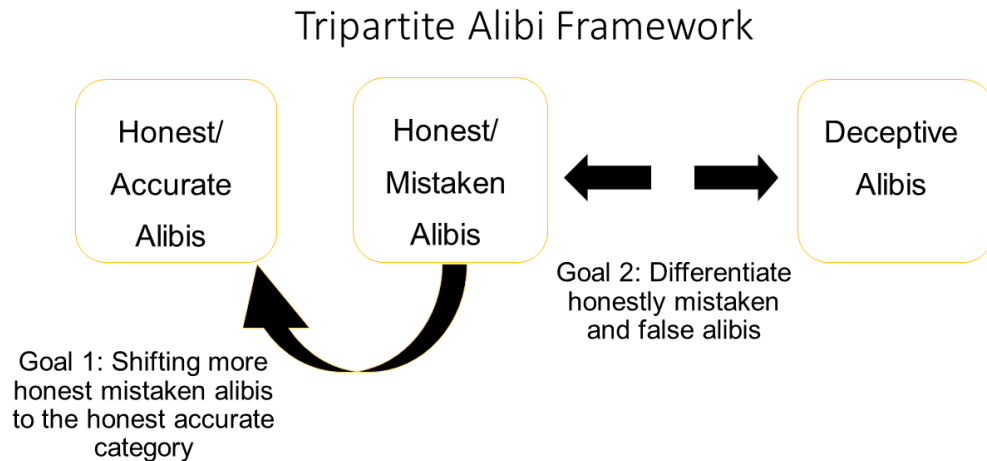


Figure 1. The Tripartite Alibi Framework

Contrastingly, an honest/mistaken alibi provider, specifically because they erroneously recall their whereabouts for the critical time, cannot produce corroborative evidence that passes an investigation stage. In this sense, honest/mistaken alibi providers are similar to deceptive alibi providers, whose stories also tend to be unverifiable or are disproved. What differentiates honest/mistaken from deceptive alibi providers is the process used to generate the alibi; whereas honest/mistaken alibi providers attempt to remember their whereabouts for the critical time, ultimately arriving at an inaccurate story, deceptive alibi providers instead actively lie with the intent to deceive the investigator.

On the basis of these relationships between the three types of alibi providers, the Tripartite Alibi Framework suggests two main applied goals to the study of alibis. Given that the honest/accurate alibi represents the best-case scenario for innocent suspects, the first applied goal of alibi research should be to discover interventions that can shift innocent alibi providers from honest/mistaken to honest/accurate. This goal squarely falls in the alibi generation domain. Having fewer innocent suspects generate inaccurate alibis means more innocent suspects are quickly freed from suspicion, with investigators conserving time and resources for finding the actual perpetrator. More importantly, inaccurate alibis endanger innocent suspects and put them at risk for wrongful incarceration, because attempts to change an alibi following the discovery of an error is often viewed with suspicion (Culhane & Hosch, 2008; Dysart & Strange, 2012).

The second applied goal of alibi research relates to the alibi believability domain: Because both honest/mistaken and deceptive alibi providers will produce false alibis, it is important to increase the ability of evaluators to differentiate between honest/mistaken and deceptive alibi providers. As such, this goal is informed by research into deception detection. Unfortunately, past research on deception detection has shown that discriminating true from false statements is difficult (Bond & DePaulo, 2006). Given that honest/mistaken alibis closely resemble deceptive alibis provided by guilty suspects based on their content (i.e., they are both incorrect), alibi evaluators such as detectives, jurors, and judges may fail to accurately discriminate between these two types of alibi providers. Because of the importance of freeing innocent individuals from suspicion and apprehending guilty suspects, novel approaches are required to differentiate honest/mistaken from deceptive alibi providers.

The primary goal of the proposed research is to test a novel, theoretically-driven intervention that is aimed at both of these goals. In order to develop such an intervention, it is important to understand (a) why innocent suspects provide mistaken alibis, and (b) why evaluators often fail at differentiating innocent from guilty suspects.

Goal 1: Improving the Accuracy of Innocent Suspects' Alibis

Alibi generation for innocent suspects is generally an autobiographical memory task, with alibi providers having to remember where they were and what they were doing at a specific time in the past (Charman et al., 2019). The first study examining alibi generation with innocent suspects involved asking participants to state their whereabouts two days prior and whether they could provide a witness or physical evidence to corroborate their story (Culhane, Hosch, & Kehn, 2008). Most of the participants reported an alibi, with 88% reporting an alibi witness for the critical time. A breakdown of the types of witnesses reported revealed that 84% of these witnesses were friends and close family members, with the rest being either co-workers, classmates, neighbors, or bosses. According to the alibi taxonomy (Olson & Wells, 2004), alibi witnesses who are motivated to lie are the least likely to be believed, and yet these were the corroborators most likely to be claimed by innocent alibi providers. Although an important first step to understanding how innocent suspects generate alibis, self-report methodology has significant shortcomings, most important of which is the lack of a way to objectively verify the accuracy of the alibi. Researchers therefore turned to alternative approaches to examine innocent suspects' alibis.

Olson and Charman (2012) sought to investigate whether innocent suspects can produce accurate and believable alibis. College students were asked to provide a narrative describing their whereabouts and activities for four two-hour time periods. The story phase was then followed up by a validation phase whereby participants were asked to investigate their own alibis over the next two days. Participants were asked to locate any physical evidence that could corroborate their story or could potentially disconfirm their initial alibis. Participants were also instructed to consult alibi witnesses they had mentioned in their initial alibis and find out whether these witnesses could corroborate their story. To assess alibi accuracy, Olson and Charman looked at whether participants' alibis changed after the validation phase. Their results showed that in total, 36% of their innocent alibi providers were honest/mistaken. Some participants were objectively wrong about their whereabouts and changed the narrative of their alibi story, whereas others had an accurate story but changed the evidence supporting their alibi after validation. Most notably, it was more common that changes in the alibis made the alibi weaker rather than stronger, as determined by the alibi taxonomy (Olson & Wells, 2004).

Complementing this work, Strange et al. (2014) conducted a two-part study examining alibi generation by innocent suspects. At Time 1, participants provided an alibi for a six-hour time period three weeks prior to alibi production. They were then asked to assess different features of their memory for that period such as what they did, the time each event occurred, and who was there, among others. All participants then investigated their whereabouts, returned at Time 2, and again reported their alibi for the same six-hour period. The accuracy of the initial alibi was assessed by coding different features of the alibi as being either consistent, partially consistent, or inconsistent. Results

showed that the percentage of participants who were consistent in terms of the different alibi features never exceeded 50%, with participants being more inconsistent about *when* an event occurred compared to *what* actually occurred. These findings, combined with Olson and Charman's (2012) modest inconsistency rate suggests that innocent suspects are often inaccurate in some way when reporting an alibi.

The research described above is, however, not without its shortcomings. The main inherent weakness in assessing alibi accuracy using information provided by participants is there is no way to objectively measure accuracy. Knowing that an alibi told at Time 2 is different from that told at Time 1 does not mean either one is accurate as both could be inaccurate. Methodologies involving participants investigating their own alibis rely on participants being motivated and capable to either confirm or disconfirm their initial story, much like a detective would. If participants were simply not motivated to research their alibis, Olson and Charman's (2012) observed rate of mistaken alibis is likely an underestimate of the true rate of mistaken alibis.

An alternative approach to assessing alibi accuracy that overcomes these obstacles would be to ask innocent suspects to provide an alibi for a period the researchers know with high certainty the suspects' whereabouts. Adopting this methodological approach, Matuku and Charman (2020) recruited participants for a two-part study ostensibly about group decision-making. At Time 1, which would later be the critical time period that participants would be asked to recall, participants arrived in groups and engaged in a decision-making task. A week later, participants returned individually and were informed that a crime had occurred and that they were to be questioned about their whereabouts. In

an interview, participants were asked about their whereabouts for the period corresponding to the group decision-making study at Time 1. Consistent with past studies showing many innocent suspects initially provide inaccurate alibis (e.g., Olson & Charman, 2012; Dysart et al., 2014), 72% of participants were honestly mistaken. The dismal performance by innocent suspects is in stark contrast to law enforcement beliefs about alibis – that innocent people should largely be accurate (Dysart & Strange, 2012).

Why would innocent people provide a mistaken alibi in the first place? After all, changes to an alibi—which would be required if an initial alibi were proven to be incorrect—are looked on with suspicion. For instance, in a survey of law enforcement officers, 81% agreed with the statement that if a suspect’s alibi changed over time, it is likely that the suspect lied to the police (Dysart & Strange, 2012). To understand the tendency for innocent suspects to produce mistaken alibis, it is necessary to examine the processes underlying alibi generation. Research has uncovered two main issues that innocent suspects face when generating an alibi: A willingness to report an alibi despite a lack of memory, and a reliance on schema-based responding.

Lacking a Memory but Reporting an Alibi Anyway

When innocent suspects are asked to provide an alibi, one of the main challenges they face is trying to remember their whereabouts and activities for a time that was very likely unremarkable to them. As such, there is a low likelihood that they encoded the mundane tasks they were engaged in at the time of the crime. Compounding this problem is that fact that innocent suspects are often asked to account for their whereabouts after a long delay, potentially months or years after the crime had occurred. Therefore, even if

an innocent suspect had encoded their activities, the traces of these memories would likely have degraded with the passage of time (Ebbinghaus, 1885).

These challenges suggest that innocent suspects may completely lack or have only very weak memories for their activities; however, results from studies reviewed above show these innocent suspects nevertheless report an alibi. Very few innocent suspects fail to provide an alibi or give an “I don’t know” response (Matuku & Charman, 2020).

Olson and Charman (2012) interpreted this finding in terms of a quantity-accuracy trade-off model. The quantity-accuracy trade-off explanation is derived from the idea that innocent suspects face a dilemma when asked to provide an alibi. On one hand, they could provide as much information as possible to convince an investigator that they are innocent, even at the risk of providing inaccurate information. On the other hand, they could report only information they are certain of, which may not be enough to prove their innocence. Based on past findings showing that innocent suspects readily provide alibis that turn out to be inaccurate (Matuku & Charman, 2020) or involve some inconsistencies (Strange et al., 2014), innocent suspects may prioritize providing a large quantity of details over being accurate.

The quantity-accuracy trade-off explanation is influenced by research in basic cognitive processes such as signal-detection theory (Klatzky & Erdelyi, 1985) and the metacognitive model (Koriat & Goldsmith, 1996). Koriat and Goldsmith’s model posits that when people are asked to remember a time in the past, they first engage in a monitoring process whereby they assess the likelihood that a given memory is accurate. The monitoring process is followed by a control process whereby a threshold or criterion

is applied. A remembered event would only be reported if the likelihood of being accurate exceeds the criterion. Raising or lowering the criterion affects the quantity and accuracy of the information reported.

In the case of alibi providers, innocent suspects may set a low criterion, reporting more information in an attempt to quell suspicion, but including details that may also be low in accuracy. This tendency places innocent suspects in a precarious situation whereby any errors uncovered during the verification process may be perceived as an attempt to deceive the investigator, rather than a memory failure. But if innocent alibi providers wish to provide an alibi despite the lack of a memory of their whereabouts, then how do they generate their alibis?

Schema-based Responding

Innocent suspects may fail to produce accurate alibis because instead of retrieving a specific memory of their whereabouts and activities at the critical time, they may rely on their schemas for the time in question. Schemas are cognitive frameworks stored in memory that help organize and interpret information drawn from past experiences (Bartlett, 1932). Indeed, most human beings have summaries for various activities such as going to a restaurant, doing laundry, and baking a cake taken from past experiences. Schemas also extend to other autobiographical events such as one's activities during a work week, a weekend, or a semester.

For instance, one's schema for a weekend may include sleeping in on a Saturday morning, running errands in the afternoon, and joining friends for dinner in the evening. When asked to account for their whereabouts on Saturday at 2:00pm an innocent person

may state that they were at the grocery store because that matches their schema for what they usually do on Saturday afternoons. To the extent that their schema matches their actual whereabouts, their alibi will be accurate. However, if they were in fact engaged in schema-inconsistent activities during the critical time period, then a schema-consistent alibi will be inaccurate.

To examine whether innocent suspects engaged in schema-based responding when providing an alibi, Leins and Charman (2016) recruited participants for a two-part study. At Time 1, participants engaged in a series of tasks which included writing an account of what they usually do at that time. The written account provided the authors with participants' schemas for the time period. Participants then returned to the lab one week later for what they believed was an unrelated study. They were informed the goal of the study was to assess a new interrogation technique, and that some participants had been instructed to commit small mock crimes over the past week (and were therefore 'guilty') whereas others had not (and were therefore 'innocent'). In reality, no such crimes had been committed and thus all participants were innocent. Participants were questioned by a blind interviewer regarding their activities for different times over the past week. One of the times they were asked about corresponded to Time 1, when they were taking part in the first study. The vast majority of participants were inaccurate when providing an alibi for the critical time. Furthermore, over 75% of participants reported their schemas for that time period as their alibi.

In a second study, Leins and Charman (2016) manipulated the schema-consistency of the critical event. Participants engaged in a schema-consistent activity

(attending a lecture), and in a schema-inconsistent activity (engaging in an experimental study during class time), and were later asked about their whereabouts during those critical times. Participants were overwhelmingly more accurate (83%) when reporting their whereabouts for the schema-consistent event compared to when reporting their whereabouts for the schema-inconsistent event (11%). These findings showing that innocent suspects tend to default to their schemas when reporting their alibis may account for the low alibi accuracy rates documented in the alibi literature, and more importantly, provide a basis for theoretical models on the alibi generation process.

The Schema Disconfirmation Model

Proposed by Charman, Matuku, and Mosser (2019) the schema disconfirmation model (see Figure 2) is a theoretical model of alibi generation that was developed in part following Mazzoni and Kirsch's (2002) metacognitive model of autobiographical memory. According to the schema disconfirmation model, when an innocent suspect is asked what they were doing at a specific time, they engage in a retrieval attempt, searching for a memory for that time period. In some cases, if the time in question is highly distinctive (e.g., July 4th) or relevant (e.g., one's birthday), that may lead to the retrieval of a specific memory detailing their whereabouts and activities for that day. This memory is then compared to the suspect's reporting criterion and is only reported if it exceeds a set threshold. However, if the memory does not exceed the criterion or, as is typical for non-distinctive dates, no memory is retrieved for that time period, the suspect will enter a second, inferential stage. In this stage, an innocent suspect assesses their beliefs about what they are usually doing at that time. The retrieved schema becomes

their default alibi. Suspects will then engage in another memory search, but this time to disconfirm their schema. This involves finding any memory that would suggest that the schema is not accurate, as confirmatory information for a schema would be of little diagnostic value.

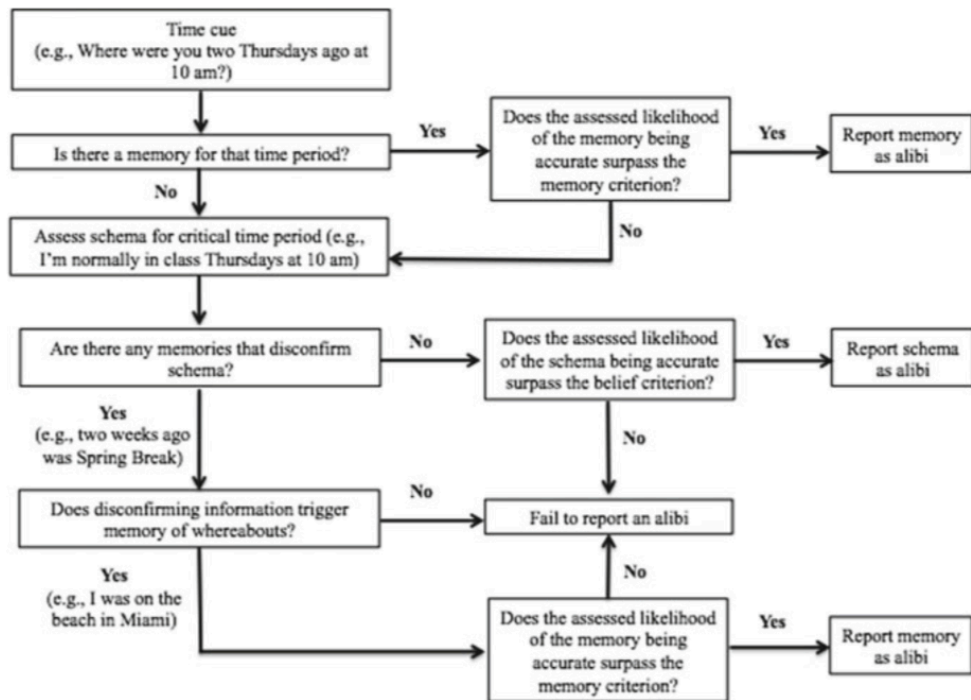


Figure 2. The Schema Disconfirmation Model

The disconfirmation phase can yield two possible outcomes. First, the suspect may fail to uncover any schema-disconfirming memorial information (e.g., “I am usually at work on Wednesdays at 3:00pm, and I have no reason to believe that my schedule for that day was different”). In this instance, the schema becomes the alibi and is then assessed against a criterion before the suspect decides whether to report it or not. The assessed likelihood of the schema being accurate will likely exceed the criterion for two reasons: (a) by definition, their schemas are what they are normally doing during the time

period, which should result in a high assessed likelihood of being correct, and (b) suspects should tend to have a relatively low belief criterion, given their motivation to remove themselves from suspicion. Thus, people's schemas often get reported as their alibi.

The second possible outcome of the disconfirmation phase is that the suspect may uncover disconfirming information (e.g., "I am usually at work on Wednesdays at 3:00pm, but two weeks ago the office was closed for renovations, so I couldn't have been at work"). The newly uncovered information may act as a cue to trigger additional memory searches ("That's the week I visited my grandmother") and/or belief searches ("I'm usually at a co-working space when I can't be at the office"). The eventual outcome from these searches is then compared to the belief criterion before being reported.

The schema disconfirmation model, although yet to be directly empirically tested, fits the existing data on alibi generation for innocent suspects. Specifically, the model accounts for the tendency for innocent suspects to provide an alibi even when they lack a specific memory of their whereabouts and activities (Olson & Charman, 2012). It also explains why inaccurate alibis tend to be schema-consistent (Leins & Charman, 2016).

In accordance with the first goal of the Tripartite Alibi Framework, the schema disconfirmation model allows for predictions for improving the accuracy of alibis generated by innocent suspects. For instance, if innocent suspects report their schema as an alibi because they fail to uncover disconfirming information in memory, then giving innocent suspects more time to search their memory for disconfirming information might be beneficial to the retrieval of relevant memories. Additionally, if innocent suspects had

access to materials that could speak to their whereabouts during a critical time period (e.g., phone records, social media posts), this information might lead innocent alibi providers to be more likely to find information that disconfirms their schemas, thus leading them to reject their schema-based alibi, and more likely to find information that acts as a cue to their actual whereabouts, thereby increasing the accuracy of their reported alibis. Both of these interventions would therefore result in innocent suspects shifting from the honest/mistaken to the honest/accurate category. However, these interventions should not increase the believability of guilty suspects' alibis to the same extent, since they do not engage in a similar memory task.

Goal 2: Differentiating Honest/mistaken from Deceptive alibis

The current research also aims to examine the second goal of Tripartite Alibi Framework by exploring differences between honest/mistaken and deceptive alibi providers. It is therefore important to understand the processes underlying how guilty suspects come up with deceptive alibis.

Compared to research examining alibi generation in innocent suspects, the literature on alibis generated by guilty suspects is limited. The main, and obvious, strategy employed by guilty suspects is to lie when asked to state their whereabouts for the time a crime occurred. The little research that has been conducted in this area has examined other qualities of a deceptive alibi. For instance, Culhane et al. (2008) asked participants whether they could provide false alibi evidence. Participants were asked to imagine that they were suspected of committing a crime and had no alibi. They were then instructed to state if they could find an alibi witness who would lie for them and say that

they were together. If they could, they were also asked to indicate the nature of the relationship they had with that person. Additionally, participants were also asked if they were able to find false physical evidence to ‘prove’ they were elsewhere at the time of the crime, and to state the nature of evidence they would provide. Results showed that a majority of participants (61%) believed they could get a person to lie on their behalf. The majority of false alibi witnesses reported in the study were parents, siblings, boy/girlfriends, or friends—witnesses categorized by the alibi taxonomy as being motivated. In terms of false physical evidence, only a third believed they could attain false physical alibi evidence; the majority of that evidence would be qualified as ‘easy to fabricate’ according to Wells and Olson’s (2004) alibi taxonomy.

The findings from this study should however be interpreted with caution, mainly because the participants in the study were not actually asked to produce the person and physical evidence they stated they could obtain. Therefore, it is not clear whether they would have actually been able to provide the false evidence. Notwithstanding this limitation, these findings reveal an important takeaway: deceptive alibis provided by guilty suspects often resemble mistaken alibis provided by innocent suspects. Culhane et al. (2008) showed that both honest/mistaken and deceptive alibis contain very little physical evidence, and tend to involve corroboration from motivated individuals. An investigator hoping to discriminate innocent from guilty suspects based on the type of evidence provided would find it a difficult task. Because of the need to discriminate between honest and deceitful alibi providers, researchers have explored other qualitative differences between honest and deceptive alibis.

Culhane et al. (2013) asked participants to provide either a true or deceptive alibi statement regarding their whereabouts for a time in the past. Deceptive alibi providers were instructed to create a novel alibi, and not generate one based on what they would normally be doing at the time. Two days later, participants returned with evidence that could support their alibi statement (i.e., physical and/or person evidence). They found that truthful participants were more likely to report friends or family as alibi witnesses compared to deceptive alibi providers. Although there were no overall differences in the physical evidence provided, the authors discovered that deceptive alibi statements were significantly longer than initially produced truthful alibis, suggesting that being long winded was indicative of deceit.

An assessment of changes made to the alibi statements revealed that complete contradictions, though generally uncommon, were significantly more frequent in deceptive alibis compared to truthful alibi statements. Despite these differences in truthful and deceptive alibis, when a separate group of participants were asked to classify the initial true and deceptive alibi statements, their overall accuracy rate was only 43%—significantly worse than chance. These findings highlight that even though discernible differences may exist between true and deceptive alibis, people’s ability to discriminate the two is woefully poor.

In an attempt to replicate these findings with a more representative sample, Nieuwkamp et al. (2018) recruited prisoners to produce either true or deceptive alibis. True alibis did not differ from deceptive alibis in terms of reported person or physical evidence. To examine alibi discrimination, a sample of police officers and college

students were presented with both true and deceptive alibis. Classification accuracy did not exceed 60%. Additionally, police officers were not better than college students at the task, showing that even professionals whose job it is to separate lies from the truth are not immune from poor lie detection performance, consistent with past research (e.g., Bond & DePaulo, 2006). To understand why people are poor at telling apart lies from the truth, it is necessary to explore the literature on lie detection.

Why People are Poor at Detecting Deception

Scientific interest into the search for behavioral cues to deception has grown steadily since the 1960s, resulting in different approaches to predicting cues to deception. Ekman and Friesen (1969) were early pioneers of the field, proposing two broad categories of cues: leakage cues and deception cues. Leakage cues were defined as those cues that revealed what a liar was trying to hide—specifically, how they feel. For instance, someone who was trying to conceal anger towards a friend would experience a micro display of that emotion. Even though the micro-expression is brief, it may still be discernible. In contrast, deception cues are cues that indicate that deception is occurring without specifying the exact nature of the information being concealed (e.g., facial and hand-to-face gestures as a signal of deception). While this conceptualization was an important start in the search for cues to deception, Zuckerman et al. (1981) argued that no one behavior or set of behaviors always occurred only when people were lying. This understanding shifted the search for cues from discovering unique behaviors associated with deception to identifying thoughts, feelings, or psychological processes that are more likely to occur in liars than truth-tellers.

A meta-analysis examining 158 potential cues to deception found that the majority of cues showed a weak or no relationship to deceit (DePaulo et al., 2003). However, liars were less forthcoming than truth-tellers, and their stories were also less compelling. Additionally, liars included fewer ordinary imperfections (e.g., spontaneous self-corrections) and unusual contents that were typical for truth-tellers. These findings are consistent with the self-presentational perspective on cues to deception that states that liars try to anticipate the kinds of communications that their audience would find credible, and exhibit behavior consistent with their own beliefs about truth telling (Vrij et al., 2004).

For instance, a liar may believe that truth-tellers only report directly relevant details and so tailor their deceptive statements to appear more convincing. However, truth-tellers often provide information in non-linear ways and provide extraneous details. These findings suggested that any real differences between liars and truth-tellers were not in *how* they say something but in *what* they say. Indeed, that statements derived from memory differ in content and quality from those based on fantasy has been an important tenet of the deception literature and is known as the Undeutsch hypothesis (Steller, 1989).

In general however, DePaulo's meta-analysis found the relationship between such cues and deception to be relatively weak. It is therefore not entirely unexpected that a follow-up meta-analysis revealed that discrimination accuracy for both lies and truths was no better than chance (54%; Bond & DePaulo, 2006). Two main explanations have been suggested to explain the low performance in discrimination.

The first explanation for why deception detection is error prone states that people have a false stereotype about deceptive behavior, and as such, use the wrong cues to make judgements about deception. The *wrong subjective cues hypothesis* (Hartwig & Bond, 2011) implies that there are indeed cues that are indicative of deceit but that people do not utilize them, relying instead on non-diagnostic cues. To investigate this perspective, researchers typically employ survey methodology in which respondents are provided with a list of behaviors (e.g., gaze aversion) and asked to explain how each behavior is related to deception. Results from such studies (e.g., Colwell et al., 2006; Lakhani & Taylor, 2003; Taylor & Hick, 2007) consistently find that people most frequently identify gaze aversion as being indicative of deceit. Lending support for the *wrong subjective cues hypothesis*, the meta-analysis by DePaulo and colleagues (2003), however, showed that gaze aversion is not a valid indicator of deception.

Contrastingly, some researchers have argued that the reason underlying poor lie detection performance is that the behavioral differences between liars and truth-tellers are small, and that people do not have enough of a basis to make accurate discriminations (e.g., Sporer & Schwandt, 2006; Vrij, 2008). This *weak objective cues hypothesis* claims there is no Pinocchio's nose—no discernible behavior separating liars from truth-tellers. According to this perspective, the finding that people rely on the wrong cues when making deception judgements is less important, because even if they did use the right cues, their discrimination performance would still be low.

Consequently, knowing whether poor lie detection performance is due to the *wrong subjective cue* or is the result of the *weak objective cue* explanation is important

for tailoring interventions that can improve people’s discrimination accuracy. For instance, if the true reason for poor discrimination is reliance on the wrong cues, individuals can be trained to focus instead on those cues that are indicative of deceit. If, however, the differences between liars and truth-tellers are indiscernible, researchers could focus on interventions that may magnify these differences (or even create new differences) to make them more discriminable.

To test the wrong subjective cue hypothesis against the weak objective cues hypothesis, Hartwig and Bond (2011) employed the Lens Model (Brunswik, 1952)—a theoretical framework designed to understand the processes of human perception. The overarching takeaway from their findings provided support for the weak objective cues hypothesis, thereby revealing that the best way to improve discrimination accuracy would be to increase the behavioral differences between liars and truth-tellers. This finding in the traditional detecting deception literature is important for understanding the low discrimination accuracy for alibi statements reported by Culhane et al. (2013). While some differences did exist between alibi statements generated by innocent and guilty suspects, these differences may have been too small to be detected.

To achieve the second goal within the Tripartite Alibi Framework (i.e., improving the differentiation of honest/mistaken and deceptive alibis), it is important to develop interventions that can magnify the differences between honest/mistaken and deceptive alibis or that can uncover novel cues to deception. In the traditional deception literature, this goal has recently been accomplished by imposing additional cognitive load on liars than on truth-tellers. For instance, Vrij et al. (2012) used a reverse-order instruction to

impose cognitive load on participants who either lied or told the truth about a route they took. Reverse-ordered answers revealed more deception cues compared to the chronologically-ordered answers, and were more accurately categorized into lies and truths.

While imposing cognitive load has been shown to improve deception detection accuracy, it may not be fully compatible for the alibi context. For instance, the methodology used in the traditional deception detection literature requires truth-tellers to engage in a relatively easy task (e.g., talk about events that had just transpired in the previous hour), and for liars to come up with a novel and deceptive account, a relatively more difficult task. Liars and truth-tellers therefore experience disproportionate different levels of cognitive load. Imposing additional cognitive load under such circumstances therefore makes lying more difficult, but telling the truth remains comparatively easy, thereby enhancing discriminability.

However, in the alibi context, both innocent and guilty suspects engage in difficult tasks. Innocent suspects have to accurately remember their whereabouts for a time in the past, whereas guilty suspects have to compose and maintain a lie. Innocent and guilty suspects therefore experience comparable levels of cognitive load. Imposing additional cognitive load under these circumstances would therefore increase task difficulty for both innocent and guilty suspects, potentially failing to affect, or even reducing, discriminability. Consequently, to uncover deception cues, it is important to examine an approach that takes advantage of the different processes underlying honest and deceptive alibi generation.

For instance, if both honest and deceptive alibi providers were given access to materials that could help them generate more accurate alibis (such as access to information on one's mobile phone), the information obtained by these materials should help them generate accurate alibis. However, deceptive alibi providers may be much less likely to take advantage of using materials such as their phone, because (a) they are not engaged in an autobiographical memory task, and may therefore not find it advantageous to use these materials, and (b) may wish to appear confident in their alibi, and therefore believable, to an evaluator. Consequently, we would expect that when given the opportunity, innocent alibi providers would use materials for a longer time and in more depth than guilty alibi providers, producing behavioral differences that allow observers to make better judgments about the veracity of alibi statements.

IV. ALIBI RESEARCH SUMMARY AND RESEARCH OBJECTIVES

The alibi literature reveals two main problems with alibi generation/evaluation: (a) Innocent alibi providers are often inaccurate when reporting their alibis, and (b) people are poor at discriminating true from deceptive alibis. Consequently, finding an intervention that can simultaneously solve each of these problems is critical. Whereas the majority of the literature on alibis has been aimed at simply describing one or both of these problems, very little work has been done to attempt to remedy them. Accordingly, Charman et al. (2019) have called for a system variable approach to the study of alibis—an investigation of interventions for improving both alibi generation accuracy and alibi discriminability. Study 1 aims to test whether interventions in which alibi providers are (a) provided more time to think about their alibi, and (b) have access to materials (such as

their phone) improve the accuracy of innocent suspects' alibis, and whether these interventions also provide cues (such as time spent looking at one's phone) that will increase behavioral differences between honest and guilty alibi providers. Study 2 aims to test whether evaluators are able to use any behavioral differences between honest and deceptive alibi providers to increase their ability to discriminate between innocent and guilty alibi providers. The present research therefore tackles both goals outlined in the Tripartite Alibi Framework.

Study 1: Improving the Accuracy of Innocent Suspects' Alibis

Recall that the literature reviewed above identified two main reasons why innocent suspects tend to produce inaccurate alibis. First, innocent suspects may lack a memory of their alibi but are nevertheless willing to report an alibi. Secondly, and most relevant here, is that innocent alibi providers tend to default to their schemas when reporting an alibi. The schema disconfirmation model (Charman et al., 2019) proposes that when alibi providers either fail to retrieve a memory of their whereabouts or their retrieved memory fails to exceed the reporting criterion, they assess their schemas to generate an alibi. The schema becomes the alibi, and innocent suspects subsequently engage in a memory search to try and disconfirm the schema (i.e., to uncover potential reasons why their schema is inaccurate).

We argue that one of the reasons innocent suspects report schema-consistent inaccurate alibis is that they fail to comprehensively search through memory to uncover schema-disconfirming memories. This failure may be caused by a combination of two main reasons. First, researchers have noted that innocence can put innocents at risk

(Kassin, 2005). Innocent suspects, driven by the knowledge of their innocence, may not adequately consider the consequences of producing an inaccurate alibi, primarily because from their perspective, finding out they were inaccurate is merely a case of being mistaken, and can always be rectified. Innocent suspects may also succumb to the illusion of transparency (Gilovich et al., 1998), believing that throughout the process of alibi generation, their innocence is apparent to investigators. An innocent alibi provider may fail to fully appreciate the negative consequences associated with providing a mistaken alibi, as changed alibis are often perceived as an attempt at deception (Culhane et al., 2008; Dysart & Strange, 2012).

Second, even if innocent suspects are motivated to conduct an additional memory search to disconfirm their schema, they may lack suitable cues to aid the retrieval of schema-disconfirming memories. That such a memory was not retrieved in the initial memory search stage of the schema disconfirmation model suggests that external memory cues may be required. To attempt to overcome this problem, the current research tests whether an intervention consisting of providing alibi providers with preparation time and access to retrieval-enhancing cues (i.e., their mobile phone) helps innocent alibi providers generate accurate alibis.

Preparation with Phone Access

There is reason to believe that when asked to provide an alibi, innocent suspects may not ask for time to think about their alibi, possibly because asking for time to think may be viewed with suspicion. Indeed, a cursory inspection of previously recorded alibis from Matuku and Charman (2020) suggests that innocent suspects often report an alibi

statement immediately after being questioned by an interviewer. It is possible therefore that a failure to provide an accurate alibi is simply a result of an incomplete initial memory search. Consequently, innocent alibi providers may benefit from having time to prepare their alibi before having to provide it to an investigator. Similar instructions to “take your time” are frequently used in investigative interviewing contexts (e.g., see Fisher et al., 2014 for a review on the communication and social dynamics of the Cognitive Interview) particularly where witnesses are encouraged to provide detailed and accurate reports of a crime. Similarly, it might be beneficial to explicitly instruct alibi providers to think about their whereabouts, and to provide them the time to do so, prior to generating their alibi.

However, providing alibi providers with additional time to generate their alibi might be insufficient if the reason for their inaccuracy results from a lack of cues regarding their whereabouts. According to the alibi disconfirmation model, these cues might help in two ways. First, external cues might increase the likelihood that the alibi provider initially remembers his/her whereabouts, precluding them from assessing their schemas (which might be incorrect). Second, if alibi providers have little memory of their whereabouts and instead assess their schemas, external cues should provide alibi providers with information that would allow them to disconfirm a schema-based alibi. Asking alibi providers to use their mobile phones when coming up with an alibi affords them access to cues that can accomplish both of these goals. For instance, if an innocent suspect is questioned about their whereabouts between 10:00am and 11:00am last Tuesday, and has no memory for that time period, the suspect might provide a schema-based alibi that they were at work. However, upon checking their text messages on their

phone, they may discover that they had been messaging with a friend earlier that morning, which would disconfirm their schema-based alibi, and lead them to remember that were actually having coffee with that friend at the critical time, thereby becoming more accurate.

Mobile phones are suitable external memory aids for two reasons: First; mobile phone usage has permeated everyday life, so much so that most daily tasks incorporate digital tasks that involve mobile phones (Wang et al., 2016). According to Pew Research, about 240 million Americans use smart phones, with about one in five Americans relying exclusively on their smartphone for internet access (Pew Research, 2019). Because of the growing dependency on smartphones, people use them at home, work, and school, using them to communicate via text and calls, engaging with social media, paying for services, taking photographs, and many other activities that can serve as cues to facilitate memory recall. Additionally, adopting mobile phone usage in the alibi generation process is a quick and easy intervention, requiring few if any additional police resources to implement.

Secondly, mobile phones present an opportunity for alibi providers to self-generate retrieval cues. For instance, mobile phones allow alibi providers to uncover unique information from their own text messages, social media activity, and call logs to help them recall their whereabouts. Past research has shown that cued retrieval is enhanced when the cues were self-generated compared to when cues were generated by others (Slamecka & Graf, 1978; Treat & Reese, 1976; Wall & Routowicz, 1987). In one study, participants were provided mnemonic cues for encoding words but were either

given their own self-generated cues or others' cues for retrieval (Mantyla & Nilsson, 1983). While having any kind of mnemonic cue (whether self- or other-generated) produced superior memory performance relative to a non-mnemonic control, participants performed better when they used their own cues as opposed to others' cues. The superiority of self-generated cues is attributed to the encoding specificity principle (Tulving & Thompson, 1972)—the idea that the cue which is most useful at retrieval is that which corresponds to the cue used for encoding.

For innocent alibi providers, information about their whereabouts and activities is likely intertwined with mobile phone use, thereby making their smartphone a rich reservoir of cues. Consequently, even in the situations whereby innocent suspects are inaccurate when providing their alibis, having access to their phones can allow them to revise their initial alibi, making it more accurate. Therefore, the primary hypothesis of Study 1 is that having innocent alibi providers take time to prepare their alibi along with accessing their mobile phones when generating their alibi should improve generation accuracy.

Study 1: Differentiating Honest from Deceptive Alibis

It is important to note that any attempt to improve the quality of innocent suspects' alibis may also inadvertently improve the quality of deceptive alibis, thereby failing to increase the ability to discriminate between true and deceptive alibis. However, in Study 1, preparation with phone access is expected to differentially affect innocent and guilty suspects. Because innocent suspects engage in an autobiographical memory task, preparation and phone access should help them provide more details about their

whereabouts and more verifiable corroborating evidence. On the other hand, because guilty people are not engaged in an autobiographical memory task, external memory cues, such as preparation with phone access, should be less likely to help guilty people's alibis.

For instance, guilty suspects may not take advantage of access to their phones. Since their main strategy is to deceive the investigator, additional memory cues will not help them to generate a story. Furthermore, it is possible that because of the pressure of engaging in impression management (see Koehnken, 1996), a guilty suspect may instead choose not to use their phone because they wish to convey that they are confident about their alibi. Given the hypothesized differences in how innocent versus guilty people would use their phones, it might be possible to use variables associated with phone use to differentiate innocent suspects from guilty suspects. As a result of the cognitive demands associated with deception, guilty suspects may talk for longer (to appear honest, Johnson et al., 1993).

Therefore, on an exploratory basis and as a secondary goal, Study 1 will examine differences in cues to deception between honest and deceptive alibi providers across numerous variables, including ones related to phone use (i.e., length of time looking at phone). The deception cues that will be assessed in the current research and the corresponding predictions are outlined below, although additional cues will be examined on an exploratory basis.

Cues that might Differentiate Honest from Deceptive Alibi Providers

Verifiable Details

Developed by Nahari, Vrij, and Fisher (2014), the verifiability approach to deception detection is predicated on two assumptions. First, liars are aware that richer accounts are perceived as more credible (Nahari et al., 2012). Second, liars tend to avoid providing too many details, fearing that an investigator may follow up on such details and discover that they are lying. These two assumptions present a dilemma to liars: On one hand, they want to appear credible by providing sufficient detail, yet on the other hand, they want to avoid providing details that may lead to them getting caught. Consequently, liars adopt a middle-of-the-ground approach whereby they offer details that cannot be verified. Drawing from this research, guilty suspects are expected to provide fewer verifiable details compared to innocent suspects.

Confidence

Guilty suspects are expected to be more concerned about appearing credible, and hence will engage in more impression management (Köhnken, 1996). Innocent suspects will however experience the difficulty of remembering their whereabouts for a time in the past. Based on these differences, guilty suspects are expected to express greater confidence in the accuracy of their alibi compared to innocent suspects.

Speech Duration

Culhane et al. (2013) found that guilty suspects tend to be long winded, attempting to appear credible by speaking for longer. Therefore, guilty suspects are

expected to speak for a longer duration when reporting their alibi compared to innocent suspects.

Phone Usage

Because guilty suspects are engaged in deception, they are not expected to benefit from phone access when generating their alibis. In contrast, innocent suspects are expected to take advantage of phone access to facilitate memory retrieval. Therefore, guilty suspects are expected to use their phones for less time than innocent suspects.

Study 1 Hypotheses

We posed the following hypotheses:

1. We expect innocent alibi providers to be mostly inaccurate when generating their alibis. Specifically:
 - 1a. We expect innocent alibi providers to be mostly inaccurate when generating the location of their whereabouts during the critical time.
 - 1b. We expect innocent alibi providers to be mostly inaccurate when generating the activities they were engaged in during the critical time.
2. Consistent with the first goal of the Tripartite Alibi Framework, which is to shift honest/mistaken alibi providers to the honest/accurate category, innocent suspects given Preparation with Phone Access are expected to be more accurate in their alibis than participants in either the control condition or the Preparation only condition.

3. Based on past findings in the alibi literature, we expect honest/mistaken alibis to be largely schema-consistent.

V. STUDY 1 METHOD

Participants

An undergraduate student sample was recruited from the Florida International University Psychology Department participant pool. A statistical power analysis for sample size estimation using G*Power (Faul et al., 2007; $\alpha = .05$, power = .80, numerator $df = 2$, groups = 3) revealed a sample of $N = 155$ would be sufficient to detect a medium effect size of $f = .25$. This medium effect size represents an odds ratio of 2.50 on the alibi accuracy outcome. To account for possible attrition between Time 1 and Time 2, we aimed to collect a final sample of $N = 180$, and stopped data collection in the week that 200th participant had completed Time 2 to allow for any exclusions. Our final sample was therefore $N = 208$. Participants were recruited for a two-part study ostensibly on problem-solving in virtual teams, and they received course credit for their participation. To be eligible for the study, all participants had to be above the age of 18, and have access to video-conferencing through Zoom and a working mobile phone. The research was preregistered on Open Science Framework and the methods can be found here <https://osf.io/zjx5u>.

Design and Overview

Participants were assigned to a 2 (Alibi Veracity: Honest, Deceptive) x 3 (Interview Approach: Control, Preparation only, Preparation with Phone Access) mixed

design. Alibi Veracity was manipulated within subjects, and Interview Approach was manipulated between subjects. Note that a ‘Phone access only’ condition was not included in the design because preparation time would have been inherent in such a condition.

Participants were recruited for a two-part study. During Time 1, participants engaged in a virtual escape room activity designed to collect information about participants’ whereabouts and information regarding their schemas for that time period. During Time 2, which took place between 8 and 10 days after Time 1, participants were interviewed and asked to generate one honest and one deceptive alibi.

Materials

Time 1 Post-activity Questionnaire

The online questionnaire (see Appendix A) was completed after participants completed the virtual escape room activity. The survey collected demographic information such as full name, age, race/ethnicity, and the address of their current location. Participants were also asked to list their typical activities for that 45-minute time period. Specifically, participants were asked to list any and all activities they are usually doing on that day of the week, and at that time. The question was used to establish participants’ schemas for that time period.

Time 2 Post-interview Questionnaire

The post-interview online questionnaire at Time 2 (see Appendix B) measured participants’ perceptions of the interview process. The first part of the survey included

questions relating to the honest-alibi interview (i.e., the interview where the participant was instructed to be truthful), whereas the second part of the survey included questions relating to the deceptive-alibi interview. Questions were presented on Likert scales (e.g., truthfulness, convincingness, motivation, difficulty). Using open-ended questions, participants were also asked to report the strategies they used to generate both their honest and deceptive alibis. Finally, participants were asked to explain whether having preparation time and having phone access was or would have been helpful when generating both their honest and deceptive alibis.

Dependent Measures

The primary dependent measure was the accuracy of participants' honest alibi, in terms of the accuracy of their activities (i.e., activity accuracy) and the accuracy of their location (i.e., location accuracy). Additionally, schema consistency was coded for both deceptive and honest/mistaken alibis. Other dependent measures included participants' perceptions of their alibis, which were collected using the post-interview questionnaire (see Appendix B for full questionnaire measures).

Procedure

Time 1

Participants signed up for a two-part study ostensibly investigating how groups solve problems in virtual teams. Participants logged into a Zoom meeting in groups ranging from four to ten and were informed by the experimenter that they would be participating in a virtual Harry Potter-themed escape room. The actual purpose of Time 1

was to establish an objective record of participants' whereabouts and activities. Upon providing written consent, participants were told they would be assigned to a timed breakout room with other participants to complete the escape room, and that they had 25 minutes to complete the activity. The escape room activity involved solving Harry Potter themed mathematical and logic problems, each providing clues to the next problem until all the problems were solved.

After participants completed the escape room activity (or after 25 minutes had elapsed, whichever came first), they returned to the main Zoom session and completed the post-activity questionnaire. After completing the online survey, all participants were reminded to attend their second scheduled research appointment and were dismissed. Time 1 sessions always occurred between Monday and Wednesday during a typical week to allow for the Time 2 interviews to only fall on weekdays.

Time 2

Participants logged onto Zoom for the Time 2 session eight to ten days after Time 1. They were informed that they would be participating in a study testing a new interviewing procedure aimed at improving investigators' ability to determine if a suspect was lying or telling the truth. Each participant was informed that they would be interviewed regarding their whereabouts and activities for two past time periods by a naïve interviewer. Alibi Veracity was counterbalanced, and participants were randomly assigned to the order either beginning with the honest or deceptive interview. For the honest alibi, participants were instructed to be truthful and to convince the interviewer with their truthful statements. For the deceptive alibi, participants were instructed to lie to

the interviewer about their whereabouts and activities but to convince the interviewer that they were being truthful.

All participants were informed that the interviewer would attempt to follow up on the details they would provide to determine whether they were lying or telling the truth. As an incentive to be convincing, participants were also informed that if they convinced the interviewer that they were telling the truth, they would be awarded an extra course credit, and that if they failed to convince the interviewer (i.e., suspected that they were lying), they would be questioned again by a different interviewer for 30 minutes. All participants did in fact receive the extra credit for participating.

In the next step, each participant was randomly assigned to one of the three Interview Approach conditions (i.e., Preparation with Phone Access, Preparation Only, or Control) and the experimenter delivered additional instructions based on the Interview Approach. Participants in the Preparation with Phone Access condition were instructed that they could have their phones with them during the interview, but only use them when the interviewer told them to. Those in the Preparation Only and Control conditions were told that they could not use their phones at any point during the interview and were asked to put their phones away. After each participant understood the instructions, they were assigned to a Zoom breakout room where an interviewer was waiting for them.

Participants were greeted by the interviewer and were informed that the interview was being recorded. The interview phase began with the interviewer asking:

“Please tell me where you were and what you were doing on [day], [date] from [time] to [time]”.

Each time frame was presented in the Day-Date-Time format. For the honest alibi interview, the day and time corresponded to the 30-minute period when the participant was engaged in the escape room activity at Time 1. For the deceptive alibi interview, the day and time corresponded to 7 days prior to Time 1. For instance, a participant who was engaged in the escape room on Wednesday, August 26th, 2020, from 5:00pm to 5:30pm would be asked in the deceptive interview to report their activities and whereabouts for Wednesday, August 19th, 2020, from 5:00pm to 5:30pm. Participants were then provided additional instructions based on the Interview Approach condition.

In the Preparation and Phone Access interview condition, participants were told that they had three minutes to prepare their alibi, and that they could check their phone during that period to help provide the best information possible. Participants were instructed to sit within the visible frame of their camera for the duration of the three minutes, and were all instructed to take the full three minutes to prepare their answer. After the three minutes had elapsed, the interviewer asked the participant to explain their whereabouts and activities, again repeating the specific day, date and time. Participants were not allowed to refer to their phones at any other point during the interviews.

The Preparation Only condition was identical to the Preparation with Phone Access condition except that participants could not use their phone, computer or any other materials to prepare their alibi. Participants were also told they had three minutes to prepare their alibi and were required to use the full three minutes for preparation. After the three minutes had elapsed, participants were again asked to report their whereabouts and activities. Participants in the control interview were not allowed time to prepare their

alibi nor were they granted phone access. They were required to immediately provide a response to the interviewer's question to provide their whereabouts and activities. The complete scripts for all three interviews are shown in Appendix C.

Regardless of the participant's response to the initial alibi question, the interviewer asked follow-up questions regarding their whereabouts and activities. First, participants were asked to specify their exact location by providing either an address, a specific landmark, or neighborhood. For instance, a participant who stated that they were at a friend's house either had to provide their friend's specific address (e.g., "1569 Evermore Lane, Miami"), indicate a landmark (e.g., "it is right next to the Shake Shack in Coral Gables") or a neighborhood (e.g., South Miami around SW 88th Street).

After specifying where they were, participants were asked to indicate what they were doing at that location. Participants were subsequently asked to state any physical evidence that could support their alibi that they were at that location at that time. After they stated any physical evidence that could support their story, the interviewer asked participants to provide information about people who could corroborate their alibi (i.e., person evidence). After providing person evidence, participants were asked to indicate whether they were reporting their alibi based on a memory for that time or based on inferences based on non-memorial information. Additionally, they were asked to indicate their percentage confidence that their alibi was accurate. Finally, the interviewer asked participants to indicate if there was any other information they would like to add to their alibi.

At this point, the interviewer informed the participant to leave the breakout room and return to the main Zoom session where the experimenter was waiting for them. After the first interview was completed, the experimenter prepared the participant for the next interview.

Participants were instructed regarding whether they should lie or tell the truth in the next interview, based on the counterbalanced Alibi Veracity conditions. Participants were also reminded of the Interview Approach instructions (i.e., whether they can use their phone in the interview or not). Note that both interviews (honest and deceptive) were conducted using the same Interview Approach. After participants understood the instructions, they were reassigned to the same Zoom breakout room where the interviewer repeated the interviewer procedure outlined above. In the second interview, the interviewer asked about the participant's whereabouts and activities for a different day and proceeded to ask the follow up questions before concluding the interview.

Post-Interview Questionnaire and Debriefing

After both interviews were completed, the experimenter shared a link to the post-interview online questionnaire. All participants were then fully debriefed about the true purpose of both studies they participated in and were awarded credit.

VI. STUDY 1 RESULTS

Manipulation Checks

Manipulation checks were conducted to ensure that participants understood the Alibi Veracity instructions they received. Participants reported high levels of truthfulness

during the honest alibi interviews ($M = 6.52, SD = 1.04$), and self-reported truthfulness did not differ as a function of Interview Approach, $F(2, 203) = 1.59, p = .21, \eta_p^2 = .02$. Similarly, participants reported high levels of motivation to convince the interviewer they were being truthful ($M = 6.01, SD = 1.29$), and motivation did not differ across the three Interview Approaches, $F(2, 203) = 1.31, p = .27, \eta_p^2 = .01$.

In the deceptive alibi interviews, participants reported high levels of deceptiveness ($M = 6.13, SD = 1.28$), and self-reported deceptiveness did not differ as a function of Interview Approach, $F(2, 203) = 1.36, p = .26, \eta_p^2 = .01$. Participants also overall reported a high motivation to lie to the interviewer ($M = 5.97, SD = 1.47$), and motivation did not differ across the Interview Approaches, $F(2, 203) = 0.68, p = .51, \eta_p^2 < .01$.

Alibi Accuracy

Coding

All honest alibi interview videos were coded by two scorers for *Location Accuracy* and *Activity Accuracy*, and the scorers co-scored over 67% of all videos. Location Accuracy was dichotomously scored (1 = accurate; 0 = inaccurate) by comparing participants' Time 1 location to their response to the Time 2 interview question "Can you tell me your exact location of your whereabouts for me?". The Time 1 location was collected in four ways: (a) Participants reported their Base Location from pre-determined categories (e.g., home, work, office, other); (b) If "other" was selected under Base Location, participants could enter their own Base Location (e.g., friend's house, uncle's house); (c) Participants reported an address (e.g., 1569 Evermore Lane,

33159, Miami, FL); and (d) Participants reported a Neighborhood (e.g., South Miami). Participants were designated as accurate if their reported location at Time 2 matched at least one of the four location categories.

Participants' Time 2 claims of their activities during Time 1 were scored as accurate if they mentioned at least one of the following activities: (a) Taking part in a SONA study; (b) Taking part in a virtual escape room; (c) Doing the Harry Potter activity; (d) Doing a research study on Zoom; and (e) Any other statements relating to the Time 1 activity. Participants were categorized as inaccurate if they reported engaging in any other activities. Partially accurate responses involving being on a video conference call (e.g., "I was on Zoom in a research methods class") were also categorized as being inaccurate. Interrater reliability for location accuracy (Cronbach's $\alpha = .90$) and activity accuracy (Cronbach's $\alpha = .97$) was high and any disagreements were resolved via discussion.

Location Accuracy

Overall, 77% of participants accurately reported their location for Time 1. The proportion of participants who accurately reported their location did not differ across the Preparation and Phone Access (82.1%), Preparation Only (80.9%), and Control (68.8%) conditions, $\chi^2(2, N = 205) = 4.38, p = .112$, Cramer's $V = .15$.

Activity Accuracy

Only 33% of participants accurately reported their activity for Time 1. A chi-square test indicated that Interview Approach significantly influenced activity accuracy,

$\chi^2 (2, N = 205) = 19.10, p < .001$, Cramer's $V = .30$. Follow up pairwise analyses showed that alibi providers given Preparation with Phone Access were significantly more accurate (50.7%) than those in the control (15.7%), $\chi^2 (1, N = 137) = 19.05, p < .001$, Cramer's $V = .37$, OR = 5.52 (95% CI: 2.48, 12.35). Alibi providers in the Preparation Only interviews (32.4%) were also significantly more accurate than those in the control, $\chi^2 (1, N = 138) = 5.25, p = .022$, Cramer's $V = .20$, OR = 2.56 (95% CI: 1.13, 5.81). Those given Preparation with Phone Access were significantly more accurate than those given Preparation Only, $\chi^2 (1, N = 135) = 4.70, p = .030$, Cramer's $V = .19$, OR = 2.16 (95% CI: 1.07, 4.33). Because an alibi provider's reported activities are central to the investigation of their alibi, all subsequent analyses involving accurate and inaccurate alibi providers will focus only on activity accuracy. Therefore, alibi providers who accurately reported their activity are classified as being honest/accurate, whereas those who inaccurately reported their activity are classified as being honest/mistaken.

Schema Consistency

Coding

All videos for deceptive and honest/mistaken alibi providers were coded by two scorers for schema consistency, and they co-scored over 67% of all videos. These alibis were dichotomously scored (1 = consistent, 0 = inconsistent) by comparing participants' self-reported schemas to their Time 2 reports of their whereabouts for Time 1. Participants' schemas for Time 1 involved either single (e.g., "I'm usually doing homework") or multiple activities (e.g., "I'm usually doing homework, watching tv, and/or eating"). An alibi was categorized as schema consistent if the Time 2 alibi

matched at least one of the listed schema activities, and all other alibis were categorized as schema inconsistent. Interrater reliability was high for all measures (Cronbach's α ; Honest/mistaken schema consistency = .94; Deceptive schema consistency = .92) and any disagreements were resolved via discussion.

Schema Consistency for Honest/mistaken and Deceptive Alibi Providers

Only 44.9% of honest/mistaken alibi providers reported a story that was consistent with their self-reported schemas. This finding did not support our hypothesis that most honestly mistaken alibis would be schema-consistent, finding instead that honest/mistaken alibi providers mostly provided alibis that were schema-inconsistent. Only 20.3% of participants reported a deceptive alibi that was schema consistent. An exact McNemar's test determined there was a significant difference in the proportion of schema-consistent alibis among honest/mistaken and deceptive alibi providers ($p < .001$). Interview Approach did not significantly influence schema consistency among honest/mistaken alibi providers (Preparation with Phone Access: 35.5%; Preparation Only: 47.8%; Control: 49.2%), $\chi^2(2, N = 136) = 1.61, p = .434$, Cramer's $V = .11$. Interview Approach also did not significantly influence schema consistency among deceptive alibi providers (Preparation with Phone Access, 21.2%; Preparation Only, 25.4%; Control, 14.5%), $\chi^2(2, N = 202) = 2.54, p = .281$, Cramer's $V = .11$.

Alibi Perceptions

We examined participants' perceptions regarding their own alibis by conducting repeated measures ANOVAs with Alibi Veracity as a within-subjects measure, and Interview Approach as a between-subjects measure. The summaries of the ANOVA

analyses are shown in Table 1 and mean ratings of participants' alibi perceptions are displayed in Table 2.

Convincingness

Participants believed their honest alibi was significantly more convincing ($M = 5.79$, $SD = 1.24$) than their deceptive alibi ($M = 5.32$, $SD = 1.33$), $F(1, 203) = 22.03$, $p < .001$, $\eta_p^2 = .098$. An independent samples t test examining whether honest/mistaken and honest/accurate alibi providers differed in perceived convincingness was not significant, $t(202) = 0.25$, $p = .800$, $d = 0.04$. Neither the main effect of Interview Approach nor the Interview Approach x Alibi Veracity interaction were significant.

Difficulty

Participants believed generating the deceptive alibi was significantly more difficult ($M = 3.47$, $SD = 1.92$) than generating the honest alibi ($M = 2.66$, $SD = 1.99$), $F(1, 203) = 22.53$, $p < .001$, $\eta_p^2 = .100$. Perceived difficulty did not significantly differ between honest/accurate and honest/mistaken alibi providers, $t(202) = 0.10$, $p = .921$, $d = 0.02$. Neither Interview Approach nor the Interview Approach x Alibi Veracity interaction were significant.

Preparation Time

We examined participants' perceptions regarding the utility of having preparation time prior to alibi generation (for those in the Preparation with Phone Access and Preparation Only conditions) and whether participants in the control condition believed preparation time would have been helpful. Alibi providers believed preparation time was

more helpful when coming up with the deceptive alibi ($M = 6.05$, $SD = 1.52$) compared to the honest alibi ($M = 5.78$, $SD = 1.61$), $F(1, 135) = 4.87$, $p = .029$, $\eta_p^2 = .035$.

Honest/accurate alibi providers ($M = 6.16$, $SD = 1.25$) believed preparation time was significantly more helpful than honest/mistaken alibi providers ($M = 5.58$, $SD = 1.75$), $t(133) = 2.12$, $p = .036$, $d = 0.38$. Neither Interview Approach nor the Alibi Type x Interview Approach interaction were significant.

Alibi providers in the Control condition overall believed preparation time would have been helpful in coming up with their honest alibi ($M = 4.46$, $SD = 2.07$) and their deceptive alibi ($M = 4.81$, $SD = 2.07$); these did not significantly differ from each other, $t(47) = 0.99$, $p = .326$, $d = 0.17$. Honest/accurate and honest/mistaken alibi providers in the Control condition did not differ from each other, $t(46) = 1.15$, $p = .257$, $d = 0.46$.

Phone Access

We also examined participants' perceptions regarding the utility of having phone access prior to alibi generation (for those in the Preparation with Phone Access condition), and whether participants in the Preparation Only and Control conditions believed phone access would have been helpful. Alibi providers interviewed with the Preparation with Phone Access approach overall believed phone access was helpful when coming up with their honest alibi ($M = 5.58$, $SD = 2.07$) and their deceptive alibi ($M = 5.13$, $SD = 2.14$), and the mean difference was not significant, $t(66) = 1.58$, $p = .119$, $d = 0.21$. Honest/accurate and honest/mistaken alibi providers did not differ from each other, $t(65) = 0.51$, $p = .614$, $d = 0.12$.

When asked whether phone access would have been helpful in coming up with their alibi, alibi providers in the Preparation Only ($M = 3.80$, $SD = 2.23$) and Control conditions ($M = 3.75$, $SD = 2.36$) did not differ significantly from each other, $F(1, 135) = 0.03$, $p = .869$, $\eta_p^2 < .001$. Participants however believed phone access would have been more helpful when coming up with their honest alibi ($M = 4.34$, $SD = 2.38$) compared to the deceptive alibi ($M = 3.21$, $SD = 2.24$), $F(1, 135) = 26.34$, $p < .001$, $\eta_p^2 = .163$. Honest/accurate and honest/mistaken alibi providers did not differ from each other, $t(134) = 1.10$, $p = .273$, $d = 0.23$. The Interview Approach x Honest Alibi interaction was not significant, $F(1, 135) = 0.35$, $p = .555$, $\eta_p^2 = .003$.

Table 1

ANOVA Summary Table for Participants' Perceptions of their Alibi

	Alibi Type			Interview Approach			Alibi Type x Interview Approach		
	<i>F</i> (df)	<i>p</i>	η_p^2	<i>F</i> (df)	<i>p</i>	η_p^2	<i>F</i> (df)	<i>p</i>	η_p^2
Convincingness	22.03 (1,203)	<.001	.098	0.75 (2,203)	.474	.007	2.34 (2,203)	.100	.023
Difficulty	22.53 (1,203)	<.001	.100	5.70 (2,203)	.291	.012	6.83 (2,203)	.104	.022
Preparation Time (PPA & PO only)	4.87 (1,135)	.029	.035	0.58 (1,135)	.448	.004	0.01 (1,135)	.940	<.001
Phone Access (PO & Control only)	26.34 (1,135)	.001	.163	0.03 (1,135)	.869	<.001	0.35 (1,135)	.555	.003

Table 2

Mean Ratings of Alibi Perceptions (SDs in parentheses)

	Preparation with Phone					
	Access		Preparation Only		Control	
	Honest	Deceptive	Honest	Deceptive	Honest	Deceptive
Convincingness	6.06 (1.04)	5.28 (1.44)	5.59 (1.32)	5.30 (1.29)	5.71 (1.31)	5.36 (1.26)
Difficulty	2.19 (1.86)	3.51 (2.07)	3.00 (1.95)	3.52 (1.80)	2.78 (2.09)	3.36 (1.91)
Preparation Time	5.87 (1.68)	6.15 (1.45)	5.70 (1.54)	5.96 (1.59)	4.46 (2.07)	4.81 (2.07)
Phone Access	5.58 (2.07)	5.13 (2.14)	4.43 (2.36)	3.17 (2.20)	4.25 (2.42)	3.25 (2.30)

Do Honest Alibis Differ from Deceptive Alibis?

We coded various measures from the recorded alibi videos to examine whether there were discernible differences between honest and deceptive alibis.

Total Corroborators and Verifiability

Coding. The number of corroborators was a count of every individual mentioned during the course of reporting the alibi. This number included every individual named in response to the interview prompt ‘Please tell me who can support your story...’, and also included any other individuals mentioned in the story. For instance, if a participant mentioned that they were taking part in a virtual escape room with 6 other individuals, and then stated that their mother could support their story, the total number of corroborators was 7.

We also coded for specific verifiable persons, who were individuals identified either (a) by first and last name (e.g., Maria Espinosa), (b) by first name and relationship (e.g., my brother Thomas), (c) using a very close relationship (e.g., my mom, my sister), or (d) using detailed and unique descriptors (e.g., “the red-haired male security guard who works at my apartment complex”).

Finally, we coded for unspecific verifiable persons, who were those individuals who were not coded as specific verifiable persons but could be tracked down by a hypothetical investigator. This measure included individuals who were identified (a) by first name only with no specified relationship (e.g., “Tammy”), (b) using a non-close relationship only (e.g., my friend, cousin), and (c) as the experimenter and participants

from the Time 1 Escape Room study. Interrater reliability was high (Cronbach's α for total corroborators_{honest} = .95; total corroborators_{deceptive} = .98; specific verifiable persons_{honest} = .93; specific verifiable_{deceptive} = .96; unspecific verifiable persons_{honest} = .98; unspecific verifiable persons_{deceptive} = .98) and any disagreements between the two scorers were resolved via discussion.

Results. For each deception cue, we conducted a 2 (Alibi Type) x 3 (Interview Approach) mixed ANOVA. The summaries of ANOVA analyses and means for deception cues are displayed in the top panels of Tables 3 and 4, respectively. We observed a significant main effect of Alibi Type on the number of specific verifiable persons. Deceptive alibi providers ($M = 2.15, SD = 1.75$) reported significantly more specific and verifiable persons compared to honest alibi providers ($M = 1.65, SD = 1.32$). Alibi Type did not significantly influence the number of total corroborators ($M_{honest} = 2.55, SD_{honest} = 1.92; M_{deceptive} = 2.81, SD_{deceptive} = 3.13$) and the number of specific verifiable persons ($M_{honest} = 0.86, SD_{honest} = 1.85; M_{deceptive} = 0.67, SD_{deceptive} = 2.63$). We also observed a marginally significant effect of Interview Approach on the number of unspecific verifiable persons. Bonferroni post hoc tests revealed that alibi providers in the Preparation Only condition provided more unspecific verifiable persons compared to alibi providers in the Control ($p = .057$). The Preparation with Phone Access condition did not differ from the Preparation Only ($p = .396$) and Control ($p = .550$) conditions. Interview Approach did not significantly influence the number of total corroborators and the number of specific verifiable persons.

We observed a significant Alibi Type x Interview Approach interaction on the total number of corroborators. Probing this interaction further revealed that in the Preparation Only condition, deceptive alibi providers ($M = 3.67, SD = 4.72$) reported more total corroborators compared to honest alibi providers ($M = 2.50, SD = 2.23$), $t(65) = 1.98, p = .052$, but this difference was only marginally significant. Honest and deceptive alibi providers did not differ from each other in the Preparation with Phone Access ($M_{honest} = 2.78, SD_{honest} = 1.80; M_{deceptive} = 2.55, SD_{deceptive} = 1.68; t(63) = 0.87, p = .388$) and Control conditions ($M_{honest} = 2.37, SD_{honest} = 1.70; M_{deceptive} = 2.23, SD_{deceptive} = 1.83; t(67) = 0.43, p = .672$). The Alibi Type x Interview Approach interaction was not significant for the specific and unspecific verifiable persons.

Speech Duration

Coding. Two coders (67% co-scored) examined speech duration for each recorded alibi in seconds. Speech duration was measured from the moment the participants started speaking after hearing the interviewer's prompt for their alibi until they finished talking. Interrater reliability was good (Cronbach's α for speech duration_{honest} = .98; speech duration_{deceptive} = .97) and any disagreements between the two scorers were resolved via discussion.

Speech Duration. Alibi providers spoke significantly longer when reporting their deceptive alibi compared to when reporting their honest alibi. Interview Approach also significantly influenced speech duration. Bonferroni post hoc tests revealed that alibis generated using Preparation with Phone Access ($p = .001$) and Preparation Only ($p < .001$) were significantly longer than alibis generated in the Control condition. Preparation

with Phone Access alibis were not significantly longer than those generated after Preparation Only ($p = 1.00$). The Alibi Type x Interview Approach was not significant.

Confidence

We examined whether self-reported confidence differed across Alibi Type and Interview Approach. Confidence was reported by alibi providers during the interview as a percentage from 0 to 100%.

None of the analyses on confidence were significant. Honest and deceptive alibi providers did not differ on self-reported confidence. The main effect of Interview Approach and the Alibi Type x Interview Approach interaction were both not significant.

Phone Usage

Coding. Two coders examined duration of phone usage (in seconds) for honest and deceptive alibis generated by participants in the Preparation with Phone Access condition ($n = 68$). Phone usage duration was measured from the moment the participants started using their phone during the 3-minute preparation time. We initially coded for Visible Phone Usage, which was the amount of time the participant's phone was on the screen, and Inferred Phone Usage, which is the total amount of time the participant appears to be using their phone when the phone itself is not in view. The latter involved examining behavior such as the participant looking down, and moving their hands/fingers in a scrolling motion. Coding results showed that very few participants ($n = 4$) had Visible Phone Usage scores for both honest and deceptive alibis. Therefore, we only

present Inferred Phone Usage results. Interrater reliability was good (Cronbach's $\alpha \geq .80$) and any disagreements between the two scorers were resolved via discussion.

Phone Usage. We conducted a paired samples t test to examine whether duration of phone usage differed as a function of alibi veracity. Results showed that alibi providers used their phones significantly longer when preparing their deceptive alibis ($M = 139.37$, $SD = 39.62$) compared to when preparing their honest alibis ($M = 120.51$, $SD = 50.98$), $t(56) = 2.58$, $p = .013$, $d = 0.41$.

Deception Cues: Are Honest/mistaken Alibis Different from Deceptive Alibis?

Assuming honest/accurate alibi providers report verifiable evidence, their alibis are theoretically able to be validated, freeing those alibi providers from suspicion. However, honest/mistaken and deceptive alibi providers will report alibis that are either unverifiable or disproved following validation. We were therefore interested in examining whether the deception cues could differentiate these two categories of alibis. We therefore conducted 2 (Alibi Type: Honest/mistaken; Deceptive) x 3 (Interview Approach: Preparation with Phone Access, Preparation Only, Control) ANOVAs for each deception cue. The summaries of all ANOVA analyses and means are shown in are displayed in the bottom panels of Tables 3 and 4, respectively.

None of the deception cues significantly differentiated honest/mistaken and deceptive alibi providers, except speech duration. Alibi providers spoke significantly longer when reporting their deceptive alibi compared to when reporting their honest/mistaken alibi. Interview Approach also significantly influenced speech duration. Bonferroni post hoc tests revealed that alibis generated using Preparation with Phone

Access ($p = .019$) and Preparation Only ($p < .001$) were significantly longer than alibis generated in the Control condition. Preparation with Phone Access alibis were not significantly longer than those generated after Preparation Only ($p = 1.00$). The Alibi Type x Interview Approach was also not significant.

Table 3
ANOVA Summary Table for Deception Cues

	Alibi Type			Interview Approach			Interaction		
	<i>F</i> (df)	<i>p</i>	η_p^2	<i>F</i> (df)	<i>p</i>	η_p^2	<i>F</i> (df)	<i>p</i>	η_p^2
<i>Honest vs Deceptive</i>									
Total Corroborators	1.23 (1,195)	.268	.006	2.74 (2,195)	.067	.027	3.52 (2,195)	.031	.035
Specific Verifiable Persons	12.39 (1,198)	.001	.059	0.42 (2,198)	.655	.004	0.78 (2,198)	.458	.008
Unspecific Verifiable Persons	0.69 (1,194)	.406	.004	2.82 (2,194)	.062	.028	2.16 (2,194)	.118	.022
Speech Duration	3.60 (1,201)	.059	.018	9.86 (2,201)	<.001	.089	0.21 (2,201)	.813	.002
Confidence	1.09 (1,199)	.298	.005	2.32 (2,199)	.101	.023	0.06 (2,199)	.940	.001
<i>Honest/Mistaken vs Deceptive</i>									
Total Corroborators	2.80 (1,129)	.096	.021	2.41 (2,129)	.094	.036	1.86 (2,129)	.161	.028
Specific Verifiable Persons	2.66 (1,130)	.104	.020	0.61 (2,130)	.545	.009	0.18 (2,130)	.838	.003
Unspecific Verifiable Persons	0.81 (1,128)	.371	.006	2.16 (2,128)	.119	.033	1.24 (2,128)	.294	.019
Speech Duration	5.28 (1,133)	.023	.038	8.67 (2,133)	<.001	.115	0.83 (2,133)	.438	.012
Confidence	1.41 (1,133)	.238	.010	1.22 (2,133)	.298	.018	0.65 (2,133)	.522	.010

Table 4

Deception Cue Means (SDs in parentheses)

	Preparation with Phone Access		Preparation Only		Control	
	Honest	Deceptive	Honest	Deceptive	Honest	Deceptive
Total Corroborators	2.78 (1.80)	2.55 (1.68)	2.50 (2.23)	3.67 (4.72)	2.37 (1.71)	2.24 (1.83)
Specific Verifiable Persons	1.56 (1.56)	2.09 (1.55)	1.65 (1.12)	2.36 (2.05)	1.74 (1.27)	2.01 (1.61)
Unspecific Verifiable Persons	1.14 (1.48)	0.44 (0.79)	0.85 (2.41)	1.31 (4.42)	0.60 (1.54)	0.26 (0.59)
Speech Duration	55.94 (41.96)	62.64 (56.31)	58.12 (41.37)	63.62 (48.05)	34.26 (22.78)	36.94 (32.36)
Confidence	96.82 (8.30)	97.37 (6.08)	94.35 (8.73)	95.03 (7.86)	96.51 (8.31)	96.78 (6.36)
	Honest/ Mistaken	Deceptive	Honest/ Mistaken	Deceptive	Honest/ Mistaken	Deceptive
Total Corroborators	2.34 (1.88)	2.56 (1.93)	2.49 (2.62)	3.93 (5.57)	2.25 (1.67)	2.28 (1.79)
Specific Verifiable Persons	2.03 (1.82)	2.22 (1.81)	1.98 (1.03)	2.44 (2.20)	1.81 (1.19)	2.09 (1.56)
Unspecific Verifiable Persons	0.28 (0.81)	0.34 (0.87)	0.52 (2.79)	1.50 (5.32)	0.41 (1.87)	0.25 (0.61)
Speech Duration	47.06 (26.79)	58.34 (57.77)	54.13 (40.33)	62.26 (45.36)	32.19 (19.66)	34.14 (27.12)
Confidence	96.13 (10.59)	98.03 (4.51)	95.11 (7.51)	95.39 (7.69)	97.05 (7.87)	97.19 (6.24)

Exploring Differences Between Honest/accurate and Honest/mistaken Alibi Providers

We were also interested in examining any underlying differences between honest/accurate and honest/mistaken alibi providers, as any differences between these two categories of alibi providers may inform our understanding of the cognitive approaches to alibi generation in innocent suspects. We therefore conducted 2 (Alibi Type: Honest/accurate; Honest/mistaken) x 3 (Interview Approach: Preparation with Phone Access; Preparation Only; Control) factorial ANOVAs on total corroborators, specific and unspecific verifiable persons, speech duration, confidence, and phone usage. The summaries of all ANOVA analyses are displayed in Table 5 and means are shown in Table 6.

We observed a significant main effect of Alibi Type on specific verifiable persons, unspecific verifiable persons, and on speech duration. Honest/mistaken alibi providers reported significantly more specific and verifiable persons compared to honest/accurate alibi providers. However, honest/accurate alibi providers reported significantly more unspecific verifiable persons and spoke significantly longer than honest/mistaken alibi providers. Looking only at participants in the Preparation with Phone Access condition, a paired samples *t* test revealed that Alibi Type did not significantly influence phone usage, $t(58) = 0.73$, $p = .471$, $d = 0.19$. Honest/accurate alibi providers ($M = 113.78$, $SD = 59.20$) did not differ significantly from honest/mistaken alibi providers ($M = 123.61$, $SD = 42.97$).

Interview Approach significantly influenced speech duration. Bonferroni post hoc tests revealed that honest alibis generated using Preparation with Phone Access ($p = .002$) and Preparation Only ($p < .001$) were significantly longer than honest alibis generated in the Control condition. Preparation with Phone Access alibis were not significantly longer than those generated after Preparation Only ($p = 1.00$). The Alibi Type x Interview Approach interaction was not significant for specific verifiable persons, unspecific verifiable person, speech duration, and confidence.

Table 5

ANOVA Summary Table for Exploratory Differences Between Honest/accurate and Honest/mistaken Alibi Providers

	Alibi Type			Interview Approach			Alibi x Interview Approach		
	<i>F</i> (df)	<i>p</i>	η_p^2	<i>F</i> (df)	<i>p</i>	η_p^2	<i>F</i> (df)	<i>p</i>	η_p^2
Total Corroborators	3.86 (1,196)	.051	.019	0.23 (2,196)	.796	.002	0.76 (2, 196)	.470	.008
Specific Verifiable Persons	12.75 (1,199)	< .001	.060	0.01 (2,199)	.995	<.001	0.51 (2,199)	.603	.005
Unspecific Verifiable Persons	21.66 (1,196)	<.001	.100	0.16 (2,196)	.856	.002	0.74 (2,196)	.477	.008
Speech Duration	6.72 (1,199)	.010	.033	4.55 (2,199)	.012	.044	0.09 (2,199)	.916	.001
Confidence	1.20 (1,198)	.274	.006	1.90 (2,198)	.153	.019	1.14 (2,198)	.321	.011

Table 6
Means (SDs in parentheses) for Exploratory Analyses Between Honest/accurate (HA) and Honest/mistaken (HM) Alibi Providers

	Preparation with Phone Access		Preparation Only		Control	
	HA	HM	HA	HM	HA	HM
Total Corroborators	3.22 (1.64)	2.30 (1.86)	2.59 (1.22)	2.49 (2.54)	3.00 (1.84)	2.21 (1.68)
Specific Verifiable Persons	1.12 (1.12)	2.00 (1.80)	1.09 (1.02)	2.00 (1.01)	1.36 (1.63)	1.78 (1.20)
Unspecific Verifiable Persons	2.00 (1.50)	0.27 (0.80)	1.45 (1.37)	0.48 (2.66)	1.64 (1.75)	0.40 (1.41)
Speech Duration	64.29 (51.43)	46.03 (27.03)	67.82 (43.36)	54.13 (40.33)	54.18 (34.21)	31.98 (19.56)
Confidence	97.48 (5.29)	96.24 (10.45)	92.77 (10.87)	95.11 (7.51)	93.64 (10.27)	97.02 (7.80)

Deception Strategies

Two raters (with 67% co-scored) examined alibi providers' self-reported deception strategies. We adapted the coding scheme used by Leins, Fisher, & Ross (2013). Each open-ended response was coded into one of seven categories, listed in Table 7. Categorization of deception strategies was not mutually exclusive. For instance, an alibi provider who stated, "I told a story about something that happened on a different day and gave very specific details about it" would be categorized under both Previously Experienced Event and Very Detailed Story. Any strategy that did not fit into the seven categories was designated as Other. Interrater reliability was high (Cronbach's $\alpha \geq .70$, see Appendix D) and any disagreements between the two scorers were resolved via discussion.

Percentages of alibi providers in each Interview Approach condition adopting each deception strategy are shown in Table 7. Overall, using a previously experienced event was the most common strategy across all Interview Approaches (41-47%). More alibi providers in the Preparation Only condition (19%) reported generating a plausible story (i.e., a story they believed was easily believable) as a strategy compared to alibi providers in the Preparation with Phone Access (6%) and Control (6%) conditions, $\chi^2 (2, N = 207) = 8.59, p = .014, \text{Cramer's } V = .20$.

Recall Strategies

Two raters (with over 67% co-scored) examined honest alibi providers' self-reported recall strategies and examined whether alibi providers based their honest alibi on a specific memory or on their usual routine/schedule. Each open-ended response was

coded into one of these two categories and are also listed in Table 7. Interrater reliability was high (Cronbach's α : Specific Memory = .80; Routine/Schedule = .89) and any disagreements between the two scorers were resolved via discussion.

Specific Memory. Honest/accurate alibi providers were more likely to report using a specific memory (55%) than honest/mistaken alibi providers (37%), $\chi^2 (1, N = 203) = 5.46, p = .020$, Cramer's $V = .164$. Interview Approach also significantly influenced the proportion of alibi providers who reported relying on a specific memory, $\chi^2 (2, N = 205) = 9.84, p = .007$, Cramer's $V = .219$. More alibi providers in the Control condition (57%) indicated relying on a specific memory to produce their honest alibi than those in the Preparation with Phone Access condition (30%), $\chi^2 (1, N = 136) = 9.85, p = .002$, Cramer's $V = .269$. The Control and Preparation Only (44%) conditions did not differ significantly, $\chi^2 (1, N = 138) = 2.35, p = .125$, Cramer's $V = .130$. The Preparation with Phone Access and Preparation Only conditions were also not significantly different from each other, $\chi^2 (1, N = 136) = 2.72, p = .099$, Cramer's $V = .141$.

Routine/Schedule. More honest/mistaken alibi providers (43%) reported relying on their schedule compared to honest/accurate alibi providers (9%), $\chi^2 (1, N = 203) = 23.62, p < .001$, Cramer's $V = .341$. Interview Approach also significantly influenced the proportion of alibi providers who reported relying on their routine to generate their honest alibi, $\chi^2 (2, N = 205) = 20.83, p < .001$, Cramer's $V = .319$. Pairwise chi-square analyses showed that more alibi providers in the Control condition (36%) indicated relying on their routine and schedule to produce their honest alibi than those in the Preparation with Phone Access condition (12%), $\chi^2 (1, N = 136) = 10.92, p = .001$,

Cramer's $V = .283$. The Control and Preparation Only (48%) conditions did not differ significantly, $\chi^2 (1, N = 138) = 1.90, p = .168$, Cramer's $V = .117$. However more alibi providers in the Preparation Only condition indicated relying on their routine and schedule to produce their honest alibi compared to Preparation with Phone Access alibi providers, $\chi^2 (1, N = 136) = 20.79, p < .001$, Cramer's $V = .391$.

Table 7

Percentages of Alibi Providers Using Various Deception and Recall Strategies, Broken Down by Interview Approach, N = 207

	Preparation with Phone Access	Preparation Only	Control
<i>Deception Strategy</i>			
Previously experienced event	47%	44%	41%
Plausible story	6%	19%	6%
Something close to the truth	10%	16%	7%
Keeping it simple	4%	4%	1%
Reporting what people normally do	0%	3%	1%
Very detailed story	2%	7%	6%
Impression management	2%	6%	4%
<i>Recall Strategy</i>			
Specific Memory	30%	44%	57%
Routine Schedule	12%	48%	36%

Note. The remaining 58% of alibi providers in the Preparation with Phone Access condition reported using their phone as their recall strategy.

VII. STUDY 1 DISCUSSION

Study 1 investigated whether preparation time and phone access could improve the accuracy of innocent alibi providers' alibis.

Alibi Accuracy and Schema Consistency

The results provided partial support for the first hypothesis. First, most alibi providers (77%) correctly reported their Time 1 location, contrary to hypothesis 1a regarding location accuracy. This finding can be understood within the context of the period within which data collection for Study 1 took place. Data collection occurred when many jurisdictions in the United States were under "stay at home" orders due to the COVID-19 pandemic, and most alibi providers reported just that – that they were at home at Time 1. However, although most participants remembered where they were at Time 1, only 33% accurately remembered taking part in the Time 1 escape room activity. This outcome provided support for hypothesis 1b and is consistent with past research demonstrating that innocent alibi providers tend to be inaccurate when remembering their activities for a past time period (Olson & Charman, 2012; Strange et al., 2014).

Consistent with the second hypothesis, alibi providers allowed access to their phones for three minutes were more accurate when reporting their honest alibis than those only given three minutes to prepare their alibis without access to their phones. When alibi providers were given three minutes to check their phone while preparing their alibi, they were approximately five times more likely to provide an accurate alibi than those who received neither preparation time nor phone access. Study 1 results also showed that preparation time alone was also beneficial for innocent alibi providers. Alibi

providers who had three minutes to prepare their story were twice as likely to provide an accurate alibi relative to control participants not given that time. These results provide support for the schema disconfirmation model (Charman et al., 2019), showing that when innocent alibi providers are given adequate time to search their memory and are provided with a rich source of external memory cues (i.e., their mobile phone), alibi providers are more likely to successfully recall their activities for a past time period. The results also showed that Preparation with Phone Access improved alibi accuracy by reducing reliance on schema, as evidenced by a lower proportion of self-reported schema reliance in that condition. Preparation with Phone Access and Preparation Only therefore emerged as two easy-to-implement interventions that can improve the accuracy of innocent suspects' alibis. Preparation with Phone Access improved alibis by reducing alibi providers' reliance on schema.

Contrary to the third hypothesis, only 45% of honest/mistaken alibi providers were schema consistent. This outcome is at odds with previous research that showed that when innocent alibi providers are inaccurate, they tend to default to their schemas (Leins & Charman, 2016). This finding, together with the finding on location accuracy, may be a consequence of the COVID-19 pandemic. Specifically, because of lockdown measures to mitigate the pandemic such as stay-at-home orders and a shift to remote work and learning, alibi providers may not have adjusted their schemas to incorporate the new "pandemic schedule". cursory inspection of the schema responses showed that about 45% of alibi providers indicated at least one schema activity that did not/could not take place at their homes (e.g., going out to eat; working out at the gym; shopping at the mall). While these alibi providers could very well have been engaging in these activities during

the lockdown period, the lower schema consistency rate should be interpreted cautiously in light of these factors.

Perceptions of the Alibi Generation Process

Our findings regarding perceptions of the alibi generation process showed that alibi providers believed generating the deceptive alibi was harder than generating the honest alibi, and that they believed their honest alibi was more convincing to the interviewer relative to the deceptive alibi. These findings demonstrate two main ideas. First, that alibi providers found it more difficult to generate the deceptive alibi supports deception research showing that lying is more cognitively demanding than telling the truth (Vrij et al., 2006). Whereas honest alibi providers have to remember and report their whereabouts, deceptive alibi providers have to report a false alibi while constantly monitoring its consistency to avoid contradictions. The alibi providers in Study 1 appear to recognize this fact based on their scores for generation difficulty.

Second, the belief that their honest alibis would be perceived as more convincing than their deceptive alibis—despite only being accurate approximately one third of the time—suggests that innocent people are overestimating their alibis and underestimating the possibility of producing a mistaken alibi (see Kassin, 2005). On average, honest alibi providers were over 95% confident their alibi was accurate. Low alibi accuracy coupled with high confidence means alibi providers may be more likely to believe that the investigation process will free them from suspicion, and may influence their future decisions to submit to additional investigative procedures such as lineups or

interrogations. These factors may therefore endanger innocent suspects, increasing the likelihood of wrongful arrest and even conviction.

Analyses of perceptions of the alibi generation process showed that alibi providers who were granted time to prepare their alibi before reporting it found preparation time more helpful for the deceptive rather than the honest alibi. This finding further underscores the disproportionate cognitive load that liars experience relative to truth-tellers. However, alibi providers who were not allowed to prepare their alibi thought preparation time would have been more helpful in generating their honest alibi rather than their deceptive alibi. Participants in the control condition may have overestimated the ease of producing a deceptive alibi when they have time to prepare the alibi.

Contrary to our expectations, alibi providers in the Preparation with Phone Access condition believed phone access to be equally helpful when generating their honest and deceptive alibi. At first blush, the notion that phone access would be helpful to a deceptive alibi provider may appear odd. However, the most common deception strategy employed by alibi providers was to report a previously experienced event. Phone access may have therefore allowed deceptive alibi providers to search their memory for a suitable event that happened prior to the critical time to report as their alibi. Interestingly, participants who were not granted phone access do not appear to have anticipated the incidental benefit of phone access for deceptive alibi generation, and instead believed it would have been more helpful for generating their honest alibi.

Alibi Discrimination

Beyond the goal of improving the accuracy of innocent suspects' alibis, Study 1 also explored potential differences between honest and deceptive alibis. The total number of corroborators mentioned did not differentiate honest from deceptive alibi providers; however, deceptive alibi providers reported more specific verifiable persons compared to honest alibi providers. This difference may be due to deceptive alibi providers believing that their alibi would not actually be investigated. Deceptive alibi providers therefore may have supplied more specific verifiable persons to appear more credible, regardless of whether or not those people would be able to corroborate the alibi. Unlike deceptive alibi providers, who were free to report as many (false) corroborators as they wished, honest alibi providers' reports were constrained by reality, reporting instead only those people who could in fact support their alibi.

Consistent with other deception research (e.g., Culhane et al., 2013; Johnson et al., 1993), deceptive alibi providers spoke for longer compared to honest alibi providers. Being long-winded may have been a strategy that deceptive alibi providers used to appear credible as they could fabricate many details, whereas honest alibi providers were constrained to the details of the events and could not fabricate details. Additionally, speech duration differed as a function of Interview Approach. Alibi providers in the Preparation with Phone Access and Preparation Only conditions both spoke for longer than did alibi providers in the Control, and this is likely because they had more time to plan the alibi and generate more details. However, because the Alibi Type x Interview Approach interaction was not significant, our interventions did not appear to magnify the

differences between honest and deceptive alibi providers. Nevertheless, speech duration differentiated honest/mistaken from deceptive alibi providers – a separation that has important forensic relevance since after a hypothetical validation process, both honest/mistaken and deceptive alibis would be shown to be inaccurate, thus requiring further cues to discriminate between them.

We anticipated that phone usage would not only improve alibi accuracy, but also help differentiate liars from truth-tellers. We specifically expected that honest alibi providers would use their phone longer compared to deceptive alibi providers. Contrary to this hypothesis, duration of phone usage was significantly different between honest and deceptive alibi providers but in the opposite direction: deceptive alibi providers used their phone for longer than honest alibi providers. It may be the case that within the three minutes of preparation, honest alibi providers quickly found cues that helped them remember their whereabouts and activities, and afterwards stopped using their phone. These alibi providers may have retrieved the relevant memories with enough confidence to not require further use of external cues. On the other hand, deceptive alibi providers may have been using their phone to determine the most appropriate previously experienced event to report as their alibi, and therefore used their phones for a longer period. Future research may benefit from objectively looking into the types of information that alibi providers used, and whether this may help discriminate liars from truth-tellers.

In addition to the exploratory results on the differences between honest and deceptive alibi providers, Study 1 results also explored differences between

honest/accurate and honest/mistaken alibi providers. These differences were examined to explore the cognitive processes underlying alibi accuracy among innocent alibi providers. Honest/accurate alibi providers reported more total corroborators and spoke for longer compared to honest/mistaken alibi providers. This finding is consistent with the fact that more honest/accurate alibi providers reported relying on a specific memory as a recall strategy. Drawing on specific memories may lead alibi providers to report more information such as people who can corroborate their story. Honest/mistaken alibi providers, on the other hand were more likely to rely on their routine or schedule as a recall strategy. This recall strategy is unlikely to lead alibi providers to retrieve a detail-rich specific memory, and as a consequence may not speak for a long time or mention many corroborators.

Taken together, the findings from this study demonstrate a clear benefit of both preparation only and preparation with phone access to innocent alibi providers. Innocent alibi providers were more likely to report an accurate alibi after being given preparation with phone Access or preparation only compared to when they received neither preparation time nor phone access. Additionally, speech and phone-use duration emerged as cues that differentiated honest from deceptive alibi providers.

VIII. STUDY 2: EFFECT OF STUDY 1 MANIPULATIONS ON ALIBI DISCRIMINATION PERFORMANCE

Study 1 examined the two goals outlined by the Tripartite Alibi Framework. The first goal was to successfully shift more honest/mistaken alibi providers to the honest/accurate category. Preparation with Phone Access and Preparation Only achieved

this goal in Study 1. The second goal of the Tripartite Alibi Framework is to explore ways of differentiating honest/mistaken from deceptive alibi providers. Study 1 revealed that only two deception cues successfully differentiated honest from deceptive alibi providers. It however remains unclear whether other people would be able to discern these differences. Furthermore, it remains unknown whether Study 1 interventions would enable alibi evaluators to better discriminate honest from deceptive alibi providers.

Past research, while limited, has suggested that classification accuracy of honest and deceptive alibi providers is poor (e.g., Culhane et al., 2013; Nieuwkamp et al., 2018). However, the phenomenology of alibis reveals three distinct categories (i.e., honest/accurate, honest/mistaken, deceptive), unlike deception detection research that only differentiates liars from truth-tellers. To our knowledge, no research has examined whether evaluators can differentiate the three categories of alibi providers. Study 2 therefore examined whether alibi evaluators could successfully classify honest/accurate, honest/mistaken, and deceptive alibi providers, and whether classification accuracy was influenced by the Interview Approach at Study 1.

Study 2 Hypothesis

1. We predicted that our Study 1 interventions would lead to better discrimination performance of alibis (relative to the Control). Specifically, study 2 evaluators will be significantly better at discriminating honest/accurate, honest/mistaken, and deceptive alibi providers when those alibi providers were interviewed after Preparation with Phone Access and Preparation Only relative to the Control.

IX. STUDY 2 METHOD

Participants

Participants were workers on Amazon's Mechanical Turk (Litman, Robinson, & Abberbock, 2016). A statistical power analysis for sample size estimation using G*Power (Faul et al., 2007; $\alpha = .05$, power = .80, allocation ratio $n_2/n_1 = 1$) revealed a sample of $n = 64$ per group ($N = 192$) was sufficient to detect a medium effect size of $d = .50$. To account for potential exclusions, we collected a sample of $N = 300$. Six participants did not pass the attention check question were excluded from all analyses, leaving a final sample of $N = 294$. Participants were mostly White (61%), mostly male (60%) and had a mean age of 39.4 ($SD = 10.67$). To be eligible for this study, all participants had to be above 18, reside in the United States, and have masters certification on MTurk and all participants who successfully completed the study were received \$4. This study was preregistered on Open Science Framework and the methods can be found here <https://osf.io/zjx5u>.

Design and Overview

Participants were assigned to a 3 (Alibi Type: Honest/accurate; Honest/mistaken; Deceptive) x 3 (Interview Approach: Preparation with Phone Access; Preparation Only; Control) mixed design. Alibi Type was manipulated within-subjects, and Interview Approach was manipulated between-subjects.

Participants watched three videos of Study 1 participants providing their alibi, and were subsequently asked to evaluate each alibi provider for veracity. All Study 2 participants will henceforth be referred to as evaluators.

Materials

Video Stimuli

We randomly sampled six videos of each Alibi Type (i.e., honest/accurate, honest/mistaken, deceptive) from each of the three Interview Approach conditions, thereby compiling a sample of $6 \times 3 \times 3 = 54$ videos. The decision to select six videos was constrained by the number of honest/accurate alibi providers in the Control conditions (the cell with the lowest frequency of accurate alibi providers) that fulfilled the predetermined selection criteria.

Videos were selected based on the following criteria: (a) Each alibi had to be at least two minutes in length; (b) the alibi provider and interviewer had to be clearly visible and audible throughout the entire video; and (c) each alibi provider could only be sampled once, ensuring that evaluators did not view more than one video from the same alibi provider. For the honest/accurate videos, we selected videos of alibi providers who were accurate when reporting both their activity and their location for Time 1 in Study 1. Honest/mistaken videos were selected from alibi providers who inaccurately reported both their activity and their location for Time 1 in Study 1.

All videos were edited to begin when the interviewer asked the alibi provider for their whereabouts and activities for a specific time period. The three-minute preparation

time was therefore excluded from Preparation with Phone Access and Preparation Only videos. Because most participants provided specific location information, all addresses were edited out from all 54 videos. All videos therefore showed alibi providers' response to the interviewer's initial prompt and responses to all follow-up questions.

Dependent Measures

An online survey was administered after evaluators watched each of the three alibi videos. The main dependent measure was evaluators' decision regarding the alibi provider's veracity (honest/accurate; honest/mistaken; deceptive) and this was a forced choice measure. Upon making a choice regarding an alibi provider's veracity, evaluators answered an open-ended question to explain their veracity choice. Other questions measured evaluators' perceptions of the alibi provider (e.g., believability, deceptiveness, helpfulness, nervousness, confidence, thoughtfulness, friendliness, fluency), and evaluators' perceptions of their own decision process (e.g., confidence, decision difficulty). We also asked evaluators to indicate the extent to which they relied on various cues to make their decisions (e.g., physical evidence, person evidence, quantity of detail, fluency, body language, confidence, ease of generation). For a complete listing of dependent measures, see Appendix E.

Procedure

Evaluators completed the study on Amazon's Mechanical Turk. The study was advertised as an experiment testing how people evaluate stories. In the consent form, evaluators learned that they would receive \$4 in exchange for their participation. After

providing consent, evaluators were required to check a captcha box on the survey before continuing to ensure the survey was not completed by automated bots (Bai, 2018).

Evaluators were informed that they would be watching a series of videos wherein different individuals were questioned about their whereabouts and activities. Evaluators were told their role was to imagine that each of the individuals is suspected of committing a crime, and their task was to evaluate the alibis. The survey proceeded to explain the three categories of alibi providers (honest/accurate, honest/mistaken, deceptive), and evaluators read an example of each alibi type (see Appendix F for full instructions). To minimize demand characteristics, evaluators were then told that they would be randomly assigned to watch five videos; in actuality, they only viewed three videos. Prior to watching the videos, all evaluators were tested regarding their understanding of the three types of alibis and were asked to select the correct alibi types from six options. After the test question, the survey proceeded to an audiovisual test portion where evaluators were asked to indicate what they heard and saw in a tester video, and could only proceed with the survey after passing this test.

Evaluators were then randomly assigned to view alibi videos, under the constraint that they viewed one honest/accurate alibi provider, one honest/mistaken alibi provider, and one deceptive alibi provider. Interview Approach was manipulated between-subjects, such that evaluators only viewed videos generated from one Interview Approach condition. The order of the alibi type was randomized. Autoplay was enabled and video controls disabled for all videos. Evaluators could not proceed to the next survey page until the alibi video had played in its entirety.

After each video, evaluators were asked to indicate the veracity of the alibi provider, and to answer questions regarding their perceptions of the alibi provider, and of their decision process. After all three videos had been presented, the survey proceeded to an attention check question where participants were asked to select a question that all three alibi providers were asked in the interview. Respondents who failed to correctly answer this question were directed to the end of the survey and their participation was terminated. The last phase of the survey collected evaluators' demographic information before the study ended. All evaluators were fully debriefed on the goals of the research.

X. STUDY 2 RESULTS

Evaluator Alibi Discrimination Performance

Evaluator categorizations of the honest/accurate, honest/mistaken, deceptive alibi providers were coded dichotomously as accurate or inaccurate. Overall, 43% of honest/accurate alibi providers, 17% of honest/mistaken alibi providers, and 20% of deceptive alibi providers were accurately classified. Table 8 shows the proportions of accurate classifications for each Interview Approach condition.

Does Interview Approach Influence Accuracy Classifications?

To explore whether the Interview Approach in Study 1 influenced the accuracy of classifying honest/accurate, honest/mistaken, and deceptive alibi providers, we conducted a series of logistic regressions. The logistic regression models with Interview Approach predicting the classification of honest/accurate, $\chi^2 (2) = 3.24, p = .198$, Nagelkerke $R^2 = .015$, honest/mistaken, $\chi^2 (2) = 0.01, p = .997$, Nagelkerke $R^2 < .001$, and deceptive alibi

providers, $\chi^2(2) = 4.79, p = .091$, Nagelkerke $R^2 = .026$, were all not significant. In other words, Interview Approach at Study 1 did not significantly predict evaluator's abilities to accurately classify alibi providers as being honest/accurate, honest/mistaken, or deceptive.

Does Interview Approach Influence Believability and Deceptiveness Ratings?

We explored whether Interview Approach at Study 1 influenced evaluators' continuous ratings of perceived believability and deceptiveness. First we conducted a mixed 3 (Alibi Type: honest/accurate, honest/mistaken, deceptive) x 3 (Interview Approach: Preparation and Phone Access, Preparation Only, Control) ANOVA on believability ratings, with Alibi Type as a within-subjects measure, and Interview Approach as a between-subjects measure.

We observed a significant main effect of Alibi Type on believability ratings, $F(2,289) = 6.80, p = .001, \eta_p^2 = .045$. Bonferroni post hoc tests revealed evaluators rated honest/mistaken ($M = 5.44; SD = 1.54, p = .014$) and deceptive ($M = 5.49; SD = 1.57, p = .001$) alibi providers as being significantly more believable than honest/accurate alibi providers ($M = 5.03; SD = 1.75$). Believability ratings for honest/mistaken and deceptive alibi providers did not differ significantly ($p = 1.00$). Interview Approach significantly influenced perceived believability, $F(2,289) = 6.59, p = .002, \eta_p^2 = .043$. Bonferroni post hoc tests revealed that alibi providers interviewed in the Preparation Only condition ($M = 5.61; SD = 1.43$) were perceived as being more believable compared to those interviewed in the Preparation with Phone Access ($M = 5.17; SD = 1.74, p = .004$) and Control ($M = 5.19; SD = 1.62, p = .007$) conditions. The Control and Preparation with Phone Access

conditions did not differ from each other ($p = 1.00$). The Alibi Type x Interview Approach interaction was also not significant, $F(4,580) = 1.52, p = .194, \eta_p^2 = .045$.

We conducted another 3 x 3 mixed ANOVA on evaluators' ratings of perceived deceptiveness. The main effect of Alibi Type was significant, $F(2,289) = 7.79, p = .001, \eta_p^2 = .051$. Evaluators perceived honest/accurate alibi providers ($M = 3.39; SD = 1.84$) as being more deceptive than deceptive alibi providers ($M = 2.88, SD = 1.77, p < .001$). Honest/accurate alibi providers were perceived as being marginally more deceptive compared to honest/mistaken alibi providers ($M = 3.06; SD = 1.82, p = .061$). Honest/mistaken and deceptive alibi providers did not differ significantly on perceived deceptiveness ($p = .574$). The main effect of Interview Approach, $F(2,290) = 1.16, p = .314, \eta_p^2 = .008$, and the Interview Approach x Alibi Type interaction, $F(4,580) = 0.88, p = .474, \eta_p^2 = .006$, were both not significant.

Cues Used by Evaluators for Alibi Discrimination

We explored the types of cues evaluators reported relying on to make their decisions regarding each alibi provider (see Appendix E for cue descriptions). We conducted MANOVAs to test whether Study 1 Interview Approach influenced the cues evaluators reported relying on. We conducted three MANOVAs separately for honest/accurate, honest/mistaken, and deceptive alibis. The mean ratings of cues are shown in Table 9; higher scores indicate greater reliance on the cue. The multivariate effect of Interview Approach was not significant for honest/accurate, $F(14, 568) = 1.00, p = .446, \eta_p^2 = .024, \text{Wilks' } \lambda = .952$, honest/mistaken, $F(14, 568) = 1.53, p = .095, \eta_p^2 = .036, \text{Wilks' } \lambda = .929$, and deceptive alibi providers $F(14, 568) = 1.39, p = .153, \eta_p^2 =$

.033, Wilks' $\lambda = .935$. In other words, Study 1 Interview Approach did not change the cues that evaluators reported relying on when assessing alibi providers.

Evaluator Perceptions of Alibi Providers' Behavior

We explored whether Alibi Type and Interview Approach influenced evaluators' perceptions of alibi providers on six behavioral ratings: helpfulness, nervousness, confidence, thoughtfulness, friendliness, and fluency (see Appendix E for behavior descriptions). We conducted a 3 (Alibi Type: Honest/accurate; Honest/mistaken; Deceptive) \times 3 (Interview Approach: Preparation with Phone Access; Preparation Only; Control) for each of the behavioral measures. To reduce the likelihood of Type 1 error, we adjusted the critical α to $.05/6 = .008$ using a Bonferroni correction. The ANOVA analyses are summarized in Table 10, and all mean ratings of behaviors are shown in Table 11; higher scores indicate increased perceptions of the behavior.

The main effect of Alibi Type was significant for helpfulness, nervousness, confidence, friendliness, and fluency. Post hoc tests revealed that deceptive alibi providers were perceived to be significantly more helpful ($p < .001$) and friendly ($p = .002$) compared to honest/accurate alibi providers. Honest/mistaken alibi providers were perceived as being significantly more confident ($p < .001$) and fluent ($p < .001$) when reporting their alibi compared to honest/accurate alibi providers. Deceptive alibi providers were also perceived as being significantly more confident ($p < .001$) and fluent ($p < .001$) compared to honest/accurate alibi providers. Honest/accurate alibi providers were perceived as being significantly more nervous compared to both honest/mistaken ($p < .001$) and deceptive ($p < .001$) alibi providers.

Interview Approach significantly influenced evaluator perceptions of helpfulness and thoughtfulness. Post hoc tests revealed that alibi providers interviewed in the Preparation Only condition were perceived as being more helpful compared to alibi providers in the Preparation with Phone Access ($p = .009$) and Control ($p = .049$) conditions. Alibi providers interviewed in the Preparation Only condition were also perceived as being more thoughtful compared to alibi providers in the Preparation with Phone Access ($p = .032$) and Control ($p = .008$) conditions. All Alibi Type x Interview Approach interactions were not significant.

Table 8

Proportions of Alibi Categorizations for each Interview Approach Condition

	Evaluator Categorizations		
	Honest/accurate	Honest/mistaken	Deceptive
<i>Alibi Provider Status</i>			
Preparation with Phone Access			
Honest/accurate	.41	.29	.29
Honest/mistaken	.57	.17	.26
Deceptive	.58	.23	.19
Preparation Only			
Honest/accurate	.50	.29	.21
Honest/mistaken	.64	.17	.19
Deceptive	.71	.16	.13
Control			
Honest/accurate	.38	.36	.26
Honest/mistaken	.68	.18	.14
Deceptive	.61	.13	.26

Table 9
Mean Ratings of the Extent to which Evaluators Relied on each Cue to Categorize Alibi Providers (SDs in parentheses)

	Preparation with Phone Access	Preparation Only	Control
Honest/accurate alibi providers			
Physical evidence	4.52 (1.64)	4.35 (1.85)	4.20 (1.77)
Person evidence	4.74 (1.79)	4.85 (1.70)	4.71 (1.78)
Amount of detail provided	5.17 (1.53)	5.33 (1.46)	4.86 (1.60)
Fluency	5.42 (1.39)	5.30 (1.42)	4.97 (1.70)
Body language	5.22 (5.02)	5.02 (1.63)	4.75 (1.72)
Confidence	5.10 (1.52)	5.13 (1.43)	4.86 (1.70)
Ease of alibi generation	5.27 (1.19)	5.01 (1.35)	4.86 (1.41)
Honest/mistaken alibi providers			
Physical evidence	4.97 (1.69)	4.79 (2.05)	4.72 (1.80)
Person evidence	5.19 (1.59)	5.29 (1.61)	4.67 (2.01)
Amount of detail provided	5.08 (1.67)	5.45 (1.38)	5.30 (1.48)
Fluency	5.22 (1.52)	5.53 (1.30)	5.40 (1.44)
Body language	5.18 (1.51)	5.09 (1.65)	5.14 (1.71)
Confidence	5.18 (1.59)	5.41 (5.41)	5.38 (1.62)
Ease of alibi generation	5.27 (1.22)	5.55 (1.33)	5.56 (1.38)
Deceptive alibi providers			
Physical evidence	4.74 (1.94)	4.95 (1.72)	4.48 (1.93)
Person evidence	5.30 (1.45)	5.72 (1.39)	5.30 (1.56)
Amount of detail provided	5.45 (1.34)	5.89 (1.19)	5.31 (1.47)
Fluency	5.39 (1.31)	5.66 (1.27)	5.57 (1.31)
Body language	5.30 (1.31)	5.33 (1.53)	5.45 (1.49)
Confidence	5.48 (1.37)	5.61 (1.20)	5.62 (1.38)
Ease of alibi generation	5.30 (1.31)	5.68 (1.28)	5.54 (1.46)

Table 10
ANOVA Summary Table on Perceptions of Alibi Providers' Behavior

	Alibi Type			Interview Approach			Alibi Type x Interview Approach		
	<i>F</i> (df)	<i>p</i>	η_p^2	<i>F</i> (df)	<i>p</i>	η_p^2	<i>F</i> (df)	<i>p</i>	η_p^2
Helpfulness	9.05 (2,289)	<.001	.059	5.05 (2,290)	.007	.034	1.85 (4,580)	.088	.014
Nervousness	18.05 (2,289)	<.001	.111	0.32 (2,290)	.729	.002	1.84 (4,580)	.120	.013
Confidence	25.18 (2,289)	<.001	.148	1.56 (2,290)	.211	.011	1.45 (4,580)	.218	.010
Thoughtfulness	3.80 (2,289)	.024	.026	5.34 (2,290)	.005	.036	1.56 (4,580)	.184	.011
Friendliness	6.01 (2,289)	.003	.040	1.88 (2,290)	.155	.013	1.13 (4,580)	.341	.008
Fluency	19.88 (2,289)	<.001	.121	3.87 (2,290)	.022	.026	1.68 (4,580)	.154	.011

Table 11
Mean Ratings of Evaluator Perceptions of Alibi Providers (SDs in parentheses)

	Preparation with Phone Access	Preparation Only	Control
Honest/accurate alibi providers			
Helpfulness	5.03 (1.51)	5.34 (1.44)	4.84 (1.38)
Nervousness	3.77 (1.85)	4.22 (1.92)	4.42 (1.73)
Confidence	4.59 (1.64)	4.61 (1.65)	4.25 (1.50)
Thoughtfulness	4.83 (1.59)	5.09 (1.49)	4.78 (1.45)
Friendliness	5.02 (1.51)	5.02 (1.37)	4.90 (1.36)
Fluency	4.89 (1.60)	5.05 (1.54)	4.69 (1.54)
Honest/mistaken alibi providers			
Helpfulness	4.86 (1.63)	5.40 (1.33)	5.35 (1.47)
Nervousness	3.53 (1.92)	3.36 (1.98)	3.39 (1.93)
Confidence	4.93 (1.66)	5.40 (1.43)	5.30 (1.47)
Thoughtfulness	4.56 (1.57)	4.77 (1.66)	4.54 (1.69)
Friendliness	4.91 (1.49)	5.34 (1.36)	5.15 (1.56)
Fluency	5.19 (1.49)	5.77 (1.18)	5.65 (1.20)
Deceptive alibi providers			
Helpfulness	5.39 (1.35)	5.75 (1.23)	5.33 (1.33)
Nervousness	3.42 (1.86)	3.45 (2.02)	3.33 (1.85)
Confidence	5.27 (1.39)	5.40 (1.53)	5.24 (1.70)
Thoughtfulness	4.71 (1.56)	5.40 (1.49)	4.55 (1.58)
Friendliness	5.32 (1.29)	5.58 (1.42)	5.18 (1.59)
Fluency	5.38 (1.42)	5.68 (1.40)	5.33 (1.42)

XI. STUDY 2 DISCUSSION

Study 2 investigated whether the interventions at Study 1 improved the classification accuracy of honest/accurate, honest/mistaken, and deceptive alibi providers.

The Effect of Study 1 Manipulations on Discrimination Performance

The results did not support our hypothesis. Interview Approach at Study 1 did not successfully predict classification accuracy for any of the three alibi provider categories. This outcome may be a result of a combination of two factors. First, the *weak objective cues hypothesis* (Hartwig & Bond, 2011) suggests that poor discrimination performance when detecting deception is attributed to there being very small differences between honest and deceptive alibi providers. Furthermore, any attempt to improve discrimination performance should involve increasing the magnitude of differences between honest and deceptive alibi providers. Study 1 revealed that while honest and deceptive alibi providers did differ based on speech duration, this difference was not amplified by the Preparation with Phone Access and Preparation Only interview approaches. Evaluators in Study 2 therefore could not detect the *weak cues* the alibi providers in Study 1 may have revealed.

Second, that Interview Approach at Study 1 did not influence discrimination performance in Study 2 could also be due to a truth bias in evaluator decisions. Bond and DePaulo's meta-analysis (2006) revealed that while global truth-lie classification accuracy was not greater than chance, evaluators were better at classifying truths rather than classifying lies. Similarly, study 2 results showed that 43% of honest/accurate alibi providers were correctly classified, whereas only 17% of honest/mistaken and 20% of

deceptive alibi providers were correctly classified. Furthermore, an inspection of the proportions of alibi provider classifications in Table 8 shows that when study 2 evaluators misclassified honest/mistaken and deceptive alibi providers, they defaulted to classifying them as honest/accurate. The Interview Approach at Study 1 may not have been adequate to free evaluators from this truth bias, thereby explaining why Interview Approach did not improve discrimination performance in study 2.

It is worth noting, however, that while Preparation with Phone Access did not improve alibi discrimination, it also did not hurt it. Study 2 showed that deceptive alibi providers interviewed in the Preparation with Phone Access condition were perceived as being more believable relative to honest/accurate alibi providers in that condition. These findings suggest that Preparation with Phone Access could have significantly affected evaluators' classification accuracy in that condition but the regression analyses revealed no significant effect of Interview Approach. Because Preparation with Phone Access improved alibi accuracy rates in Study 1 and did not hurt alibi discrimination in Study 2, this approach therefore emerges as a valuable intervention.

Evaluator Perceptions of Alibi Providers

Study 2 showed that honest/mistaken and deceptive alibi providers were perceived as being more believable than honest/accurate alibi providers. Correspondingly, honest/accurate alibi providers were perceived as being more deceptive compared to honest/mistaken and deceptive alibi providers. This ironic finding has a simple explanation. In Study 1, honest/accurate alibi providers were more likely to rely on a specific memory when reporting their alibi compared to honest/mistaken and

deceptive alibi providers. It may be that honest/accurate alibi providers' deteriorated memory traces resulted in a weak (although accurate) alibi, and evaluators interpreted the weakness of the alibi as being indicative of deceptive and was therefore less believable. Because honest/mistaken and deceptive alibi providers were relying on schemas and fabrication respectively, their stories were not susceptible to memory trace decline, and were therefore perceived as being more believable.

Study 2 results also revealed that deceptive alibi providers were perceived as being more helpful and friendly compared to honest/accurate alibi providers. That deceptive alibi providers were more friendly supports the idea that liars engage in impression management to convince their audience of their truthfulness (Bourdage et al., 2018). Honest/mistaken and deceptive alibi providers were also perceived as speaking more fluently when reporting their alibis compared to honest/accurate alibi providers, which is again consistent with honest/accurate alibi providers rely on faulty memory processes. These findings underscore that evaluator beliefs about what an honest/accurate alibi provider should look like are inconsistent with how innocent people behave when they accurately report information about their past whereabouts and activities.

Study 2 evaluators also perceived alibis generated in the Preparation Only condition as being more believable than those in the Preparation with Phone Access and Control conditions. This finding was surprising, as we anticipated that any benefit of preparation time would also extend to the Preparation with Phone Access condition. However, it may be that phone access influences alibis such that evaluators discount the story's believability. For instance, phone access may lead to alibi providers appearing

‘too prepared’ such that their alibis may be regarded with suspicion, whereas Preparation Only may lead to ‘reasonably prepared’ alibis which appear more convincing. Results on evaluators’ perceptions of alibi providers are consistent with this explanation, as alibi providers in the Preparation Only conditions were perceived as being significantly more helpful and having thought harder when reporting their alibi compared to alibi providers in the Preparation with Phone Access condition. However, whereas alibis generated following Preparation Only were more believable overall, this increase in believability occurred for both truthful and deceptive alibis, and consequently this interview approach did not improve discrimination of honest and deceptive alibi providers.

Finally, the self-reported cues that evaluators relied on to make their classification decisions did not differ as a function of Interview Approach. This outcome is unsurprising when one considers the extant research in deception showing that people are usually unaware of the cues they use to make deception judgments, and that they may not actually rely on the cues they report using (Bond & Hartwig, 2011). Furthermore, Interview Approach did not influence alibi providers’ cues in Study 1, therefore evaluators in Study 2 had a limited opportunity to rely on cues to make their veracity judgments.

Taken together, the findings from Study 2 reveal that people are poor at discriminating honest/accurate, honest/mistaken, and deceptive alibi providers. Furthermore, Preparation with Phone Access and Preparation Only did not improve discrimination performance among study 2 evaluators.

XII. GENERAL DISCUSSION

The alibi literature has consistently demonstrated two main findings regarding the generation and evaluation of alibis: (a) Innocent alibi providers are often inaccurate when reporting their alibis, and (b) people are poor at discriminating true from deceptive alibis. The current research addressed these two problems across two separate experiments. To guide our investigation, we proposed the Tripartite Alibi Framework, which informed our two main goals: (a) to improve the accuracy of innocent suspects' alibis, and (b) to improve the ability of evaluators to discriminate between honest and deceptive alibi providers.

Improving the Accuracy of Innocent Suspects' Alibis

Our Study 1 manipulations were successful in shifting innocent suspects from the honest/mistaken category to the honest/accurate category. Alibi providers who were given time to prepare their alibi, and those who were allowed to access their phones were more accurate when reporting their alibi, relative to those who were required to immediately report their alibi. Phone Access also provided an incremental benefit to innocent alibi providers, and also improved alibi accuracy relative to alibi providers who only received preparation time.

Preparation Time

Our finding that giving participants three minutes to prepare their alibi improved alibi accuracy provided support for the schema disconfirmation model (Charman et al., 2019), which outlines how inaccurate innocent suspects may provide an erroneous alibi

in part because they fail to adequately search their memory. This research demonstrated that similar to how instructions to ‘take your time’ are effective in investigative interviewing contexts (Fisher et al., 2014), the same instructions are beneficial in the alibi context. When innocent suspects are allowed time to search their memory and prepare their story, they are more likely to uncover information that can supplant schema-based reporting. Although schema-based responding can result in accurate alibis if the suspect was actually engaged in the schema activity, relying on a schema may be dangerous in occasions when the suspect was engaged in a schema-inconsistent activity, as our study 1 participants were. Our research showed that giving innocent suspects as little as three minutes before requesting them to report their alibi tripled the likelihood that they provided an accurate alibi.

Phone Access

The schema disconfirmation model also states that alibi providers may fail to report an accurate alibi because they fail to retrieve information that disconfirms their schema for the critical time. In our research, we allowed some alibi providers to use their phone as a resource to help them remember their whereabouts and activities. Consistent with our expectations, alibi providers who had access to their phone were more likely to be accurate when reporting their alibi, relative to those who did not receive phone access. The use of external cues retrieved from the phone may have helped alibi providers in one of two ways. First, the cues may have directly enabled alibi providers to retrieve their specific whereabouts and activities for the critical time, obviating their need to rely on their schemas.

Second, if alibi providers did in fact generate a schema for their whereabouts, external cues from their phone may have allowed them to disconfirm their schema-based alibi. Indeed, some alibi providers initially reported what they would usually be doing (e.g., “I’m usually at the gym on Tuesday afternoons...”), but later uncovered information that disconfirmed their schema (e.g., “...but I saw an email that said the gym was closed that day.”). Regardless of the exact mechanism of action, providing alibi providers with phone access allowed them to successfully solve the alibi problem.

Preparation time and phone access therefore both show great promise in improving the accuracy of innocent suspects’ alibis. By ensuring that innocent suspects accurately report their alibi the first time, we can reduce likelihood of a cascade of negative outcomes that may affect honest/mistaken alibi providers.

Autobiographical Memory for Past Events

The current research also provided insight into our understanding of autobiographical memory. Study 1 showed that even though the majority of alibi providers (77%) accurately remembered their location during the critical time, they were less accurate (33%) when remembering their activities during that time. The relatively high accuracy rate for one’s location could be merely due to our sample being mostly at home during the critical time due to COVID restrictions; consequently, participants could reasonably guess that they were at home during that time period. It is likely, then, that this high accuracy rate is partly a reflection of good ‘guesses,’ rather than a reflection of a strong memory for one’s whereabouts.

Alternatively, it could be the case that a greater accuracy for one's location compared to one's activities is a result of the way in which alibi providers access their schemas. If people have schemas for a variety of activities and situations, we can reasonably assume that (a) alibi providers may have more than one schema for a specific time period, and (b) alibi providers may have separate schemas for location (i.e., where one usually is at a certain time) and for activity (i.e., what one is usually doing at a certain time). Activity schemas may include working out/exercising, grocery shopping, doing homework, and watching tv, whereas location schemas may include the university campus, home, or the work office. When we consider both location and activity schemas, it is apparent that many activities are location-dependent. For instance, it is more likely that one was watching tv at home rather than at the office. Therefore, when innocent suspects are asked to report their alibi and they lack a specific memory, they may engage in a two-step schema retrieval process.

In the first step, innocent suspects consider their location schema, which determines the subset of activities they could have been doing at that time. If the location schema is that they were at home, their activity schemas will include only those activities that could have taken place at home. In the second step, innocent suspects consider their activity schema *given* their location. Alibi providers relying on their schemas therefore have to only clear the first step to accurately report their location, but have to clear both steps to accurately report their activities, resulting in a higher accuracy rate for location than activities. Thus, even when innocent suspects may accurately report their location for a time in the past, they may still be poor at accurately reporting their activities.

Discriminating Honest from Deceptive Alibi Providers

Across studies 1 and 2, we also investigated our second goal of improving evaluators' abilities to discriminate honest from deceptive alibi providers. In Study 1 we tested various deception cues to determine whether they differed between honest and deceptive alibi providers. The only cues that differentiated honest and deceptive alibi providers were speech duration and the number of specific verifiable corroborators. The lack of cues that differentiate honest from deceptive alibi providers is consistent with the general deception detection literature, which also shows a lack of cues that differentiate truth-tellers from liars (cite). We expected that our interview manipulations would magnify the differences between honest and deceptive alibi providers; however, Study 1 results showed no support for our hypothesis. Furthermore, results from Study 2 demonstrated that evaluators were poor at discriminating honest/mistaken from deceptive alibi providers, consistent with past alibi research (cite). Interview Approach at Study 1 did not improve discrimination performance. These findings present a grim outlook on evaluators' ability to discriminate honest from deceptive alibis.

Our results mirror past research on deception detection in numerous ways. First, our research demonstrated that people are poor at making veracity judgments. Various meta-analyses in deception research have also shown that people are poor at discriminating truth from lies (Driskell, 2012; Hartwig & Bond, 2014; Levine, 2014; Luke, 2019). Second, our finding that deceptive alibi providers are more likely to be perceived as being friendly and helpful compared to honest deceptive alibi providers comports with research showing that liars engage in impression management to appear

convincing (Colwell et al., 2006; Hartwig et al., 2010). Third, we demonstrated that deceptive alibi providers were likely to use a previous experience or something close to the truth to come up with their false story, a finding which aligns with other research showing liars are unlikely to create completely novel stories (Leins et al., 2013).

Factors Influencing Alibi Discrimination Findings

There are multiple factors that may contribute to our findings regarding alibi discrimination. First, the differences between honest and deceptive alibi providers may indeed be too small to be detected by evaluators, and as Study 1 showed, our interview manipulations were unable to amplify those differences. Whereas traditional detecting deception researchers have been able to magnify the differences between liars and truth-tellers by leveraging the disproportionate cognitive load affecting liars and truth-tellers (Vrij et al., 2006), this strategy is more difficult within an alibi context, as both honest and deceptive alibi providers should find the experience of generating an alibi cognitively taxing, albeit for different reasons. Honest alibi providers have to search their memory for accurate details regarding their whereabouts and activities for a time in the past that was likely unmemorable for them (Charman et al., 2019). Deceptive alibi providers have to generate a false story, remember all aspects of the story as they tell it, and also be wary of inconsistencies in their story, all of which is cognitively taxing. These cognitive processes leave very little opportunity to magnify any cognitive differences between honest and deceptive alibi providers.

It is important to note that the deceptive alibi providers in our study appeared to engage in strategies that not only minimized differences between them and honest alibi

providers, but also made them appear more believable to evaluators. Making up a story and filling it with details is relatively easy for liars, and evaluators viewed such stories as genuine and truthful. Relying on memory to report an alibi is however more difficult and is error-prone, and evaluators viewed such stories as being less believable. These differences between deceptive and honest alibi providers further complicate the discrimination process.

Current trends in detecting deception research also suggests that there may not be a Pinocchio's nose to be found. A recent analysis (Luke, 2019) suggested that the corpus of deception literature is replete with publication bias, underpowered studies, and little or no replication. Therefore, the behaviors researchers have since associated with deception may not in fact be related to deception at all. Our exploratory deception cues may therefore not be informative in differentiating honest and deceptive alibi providers.

Implications and Limitations

The current research adopted a holistic approach to the study of alibis by simultaneously examining the effect of Preparation with Phone Access on both the generation and believability alibi domains. This system variables approach (Wells, 1978) to the study of alibis revealed two interventions that can improve alibi generation for innocent suspects: Both preparation time alone as well as phone access are easily implemented strategies that law enforcement officials can use to improve the accuracy of innocent suspects' statements. That these interventions did not also improve the discrimination of honest from deceptive alibi providers does not undercut the utility of these interventions, primarily because Preparation with Phone Access and Preparation

Only did not *hurt* alibi discrimination. These interventions therefore provide the basis for a standardized procedure for collecting alibi statements.

This work has also revealed strategies that may be beneficial to defense attorneys who may wish to advise innocent suspects regarding alibi statements. Since innocent suspects provide more accurate alibis after taking time to prepare their story and accessing their phone, it would be in their best interest to ask investigators for preparation time and phone access where possible. However, this recommendation is likely only helpful during the early stage on an investigation where a suspect is likely not already in custody. Even then, this recommendation should be balanced against investigators' perceptions of suspects who ask for more time and or phone access. It may be that investigators could perceive a request for preparation time and phone access as a sign of culpability, which may lead to other investigative measures such as an interrogation or placing the suspect in a lineup. Alternatively, investigators may not view a request for preparation time with suspicion, especially if the resulting alibi is detailed and verifiable. Future research should examine law enforcement officials' beliefs regarding preparation time and phone access when suspects provide alibis.

This research also provided indirect support for the schema disconfirmation model (Charman et al., 2019) by showing that both Preparation with Phone Access and Preparation Only can reduce schema-based responding in innocent alibi providers. It should be noted that even in the best-case scenario, only half of the alibi providers in the Preparation with Phone Access condition were accurate. Future research should explore

other avenues to further reduce schema-reliance and improve accuracy among innocent alibi providers.

Notwithstanding the valuable contributions of this research, there are two main limitations. First, Study 1's methodology involved a Time 1 scenario for researchers to determine ground truth regarding participants' whereabouts and activities for the critical time period. This approach to assessing accuracy necessarily creates an artificial Time 1 scenario, as participants are asked to account for their whereabouts for a time when they were engaged in a schema-inconsistent task that they ordinarily would not be doing. The low activity accuracy rates may therefore be an artifact of the unusual Time 1 activity. Future research should employ a methodology, such as GPS tracking, that both establishes ground truth and does not create artificial events for alibi providers.

Second, it is likely that deceptive alibi providers believed their stories would not be investigated, and therefore reported exaggerated and detailed false alibis. In the real world, however, guilty suspects will likely provide alibis that are unverifiable, rather than risking their alibi being disproved (Nahari et al., 2014). This difference may explain why evaluators were not able to discriminate honest from deceptive alibi providers in Study 2. Additionally, the penalty to alibi providers for being caught lying to the interviewer (i.e., being interviewed again for 30 minutes) was relatively innocuous. Guilty suspects in the real world have a greater motivation to successfully avoid detection, and may adjust their deception strategies accordingly. Future research should explore ways of increasing psychological realism in alibi discrimination studies.

In conclusion, this research tested revealed two novel interventions that can improve the accuracy of innocent suspects' alibis. It is important for future research to continue to explore the theoretical process of alibi generation to discover new interventions aimed at reducing alibi inaccuracy in innocent suspects. Furthermore, this research underscores the complexity of detecting deception within the alibi context. It is imperative that future research simultaneously examine both the generation and evaluation alibi domains to develop procedures that promote justice in all its forms.

REFERENCES

- Bai, H. (2018, August 9). Re: Suspected bot contamination on MTurk. Retrieved from: https://groups.google.com/forum/#!topic/otree/H8_xIeangAk
- Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. Cambridge University Press.
- Bond, C. F., & DePaulo, B. M. (2006). Accuracy of deception judgments. *Personality and Social Psychology Review*, 10(3), 214–234. https://doi.org/10.1207/s15327957pspr1003_2
- Brunswik, E. (1952). *The conceptual framework of psychology*. University of Chicago Press.
- Burke, T. M., Turtle, J. W., & Olson, E. A. (2007). Alibis in criminal investigations and trials. In M. P. Toglia, D. F. Ross, J. D. Read & R. C. L. Lindsay (Eds.), *Handbook of eyewitness psychology, Vol I: Memory for events* (pp. 157–174). Lawrence Erlbaum and Associates.
- Charman, S., Matuku, K., & Mosser, A. (2019). The psychology of alibis. In: Bornstein B., Miller M. (Eds), *Advances in Psychology and Law* (pp. 41-72). Springer, Cham.
- Colwell, K., Hiscock-Anisman, C., Memon, A., Woods, D., & Michlik, P. M. (2006). Strategies of impression management among deceivers and truth-tellers: How liars attempt to convince. *American Journal of Forensic Psychology*.
- Colwell, L. H., Miller, H. A., Miller, R. S., & Lyons, Jr, P. M. (2006). US police officers' knowledge regarding behaviors indicative of deception: Implications for eradicating erroneous beliefs through training. *Psychology, Crime & Law*, 12(5), 489–503. <https://doi.org/10.1080/10683160500254839>
- Culhane, S. E., & Hosch, H. M. (2012). Changed alibis. *Criminal Justice and Behavior*, 39(7), 958–977. <https://doi.org/10.1177/0093854812438185>
- Culhane, S. E., Hosch, H. M., & Kehn, A. (2008). Alibi Generation: Data from U.S. Hispanics and U.S. non-Hispanic whites. *Journal of Ethnicity in Criminal Justice*, 6(3), 177–199. <https://doi.org/10.1080/15377930802243395>
- Culhane, S. E., Kehn, A., Horgan, A. J., Meissner, C. A., Hosch, H. M., & Wodahl, E. J. (2013). Generation and detection of true and false alibi statements. *Psychiatry, Psychology and Law*, 20(4), 619–638. <https://doi.org/10.1080/13218719.2012.729018>

- DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenbruck, L., Charlton, K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin*, 129(1), 74-118. <https://doi.org/10.1037/0033-2909.129.1.74>
- Do, T. M. T., & Gatica-Perez, D. (2013). The places of our lives: visiting patterns and automatic labeling from longitudinal smartphone data. *IEEE Transactions on Mobile Computing*, 13(3), 638–648. <https://doi.org/10.1109/tmc.2013.19>
- Driskell, J. E. (2012). Effectiveness of deception detection training: A meta-analysis. *Psychology, Crime & Law*, 18(8), 713-731. <https://doi.org/10.1080/1068316X.2010.535820>
- Dysart, J. E., & Strange, D. (2012). Beliefs about alibis and alibi investigations: a survey of law enforcement. *Psychology, Crime & Law*, 18(1), 11–25. <https://doi.org/10.1080/1068316x.2011.562867>
- Ebbinghaus, H. (1964). *Memory: A contribution to experimental psychology*. Dover.
- Ekman, P., & Friesen, W. V. (1969). The repertoire of nonverbal behavior: Categories, origins, usage, and coding. *Semiotica*, 1(1). <https://doi.org/10.1515/semi.1969.1.1.49>
- Evans, J. R., Michael, S. W., Meissner, C. A., & Brandon, S. E. (2013). Validating a new assessment method for deception detection: Introducing a Psychologically Based Credibility Assessment Tool. *Journal of Applied Research in Memory and Cognition*, 2(1), 33–41. <https://doi.org/10.1016/j.jarmac.2013.02.002>
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175–191. <https://doi.org/10.3758/bf03193146>
- Fenton, J. (2016, August 22). *Two former classmates dispute account of alibi witness for 'Serial' subject Adnan Syed*. The Baltimore Sun. <https://www.baltimoresun.com/news/crime/bs-md-serial-syed-alibi-questioned-20160822-story.html>
- Fisher, R. P., Schreiber Compo, N., Rivard, J., & Hirn, D. (2014). Interviewing witnesses. In T.J. Perfect & D.S. Lindsay (Eds.), *The SAGE handbook of applied memory*, (pp. 559-578). Sage.
- Gilovich, T., Savitsky, K., & Medvec, V. H. (1998). The illusion of transparency: Biased assessments of others' ability to read one's emotional states. *Journal of Personality and Social Psychology*, 75(2), 332–346. <https://doi.org/10.1037//0022-3514.75.2.332>

- Hartwig, M., & Bond, C. F. (2011). Why do lie-catchers fail? A lens model meta-analysis of human lie judgments. *Psychological Bulletin*, *137*(4), 643–659. <https://doi.org/10.1037/a0023589>
- Hartwig, M., & Bond Jr, C. F. (2014). Lie detection from multiple cues: A meta-analysis. *Applied Cognitive Psychology*, *28*(5), 661-676. <https://doi.org/10.1002/acp.3052>
- Hartwig, M., Granhag, P. A., Stromwall, L. A., & Doering, N. (2010). Impression and information management: On the strategic self-regulation of innocent and guilty suspects. *The Open Criminology Journal*, *3*(1). <https://doi.org/10.2174/1874917801003010010>
- Holland, S. M., & Smulders, T. V. (2011). Do humans use episodic memory to solve a What-Where-When memory task?. *Animal cognition*, *14*(1), 95-102. <https://doi.org/10.1007/s10071-010-0346-5>
- Johnson, M. K., Hashtroudi, S., & Lindsay, D. S. (1993). Source monitoring. *Psychological Bulletin*, *114*(1), 3. <https://doi.org/10.1037/0033-2909.114.1.3>
- Kassin, S. M. (2005). On the psychology of confessions: Does innocence put innocents at risk? *American Psychologist*, *60*(3), 215–228. <https://doi.org/10.1037/0003-066x.60.3.215>
- Klatzky, R. L., & Erdelyi, M. H. (1985). The response criterion problem in tests of hypnosis and memory. *International Journal of Clinical and Experimental Hypnosis*, *33*(3), 246–257. <https://doi.org/10.1080/00207148508406653>
- Köhnken, G. (1996). Social psychology and the law. In G. R. Semin, & K. Fiedler (Eds.), *Applied social psychology* (pp. 257-282). Sage.
- Koriat, A., & Goldsmith, M. (1996). Monitoring and control processes in the strategic regulation of memory accuracy. *Psychological Review*, *103*(3), 490–517. <https://doi.org/10.1037//0033-295x.103.3.490>
- Lakhani, M., & Taylor, R. (2003). Beliefs about the cues to deception in high- and low-stake situations. *Psychology, Crime & Law*, *9*(4), 357–368. <https://doi.org/10.1080/1068316031000093441>
- Leins, D. A., & Charman, S. D. (2016). Schema reliance and innocent alibi generation. *Legal and Criminological Psychology*, *21*(1), 111–126. <https://doi.org/10.1111/lcrp.12035>

- Leins, D. A., Fisher, R. P., & Ross, S. J. (2013). Exploring liars' strategies for creating deceptive reports. *Legal and Criminological Psychology*, 18(1), 141-151. <https://doi.org/10.1111/j.2044-8333.2011.02041.x>
- Levine, T. R. (2014). Truth-default theory (TDT) a theory of human deception and deception detection. *Journal of Language and Social Psychology*, 33(4), 378-392. <https://doi.org/10.1177%2F0261927X14535916>
- Litman, L., Robinson, J., & Abberbock, T. (2016). TurkPrime. com: A versatile crowdsourcing data acquisition platform for the behavioral sciences. *Behavior Research Methods*, 1-10. <https://doi.org/10.3758/s13428-016-0727-z>
- Luke, T. J. (2019). Lessons From Pinocchio: Cues to Deception May Be Highly Exaggerated. *Perspectives on Psychological Science*, 14(4), 646–671. <https://doi.org/10.1177/1745691619838258>
- Mantyla, T., & Nilsson, L.-Gö. (1983). Are my cues better than your cues? Uniqueness and reconstruction as prerequisites for optimal recall of verbal materials. *Scandinavian Journal of Psychology*, 24(1), 303–312. <https://doi.org/10.1111/j.1467-9450.1983.tb00504.x>
- Matuku, K., & Charman, S. D. (2020). Enhancing innocent suspects' memories for corroborating alibi evidence. *Psychology, Public Policy, and Law*, 26(4), 442–454. <https://doi.org/10.1037/law0000264>
- Mazzoni, G., & Kirsch, I. (2002). Autobiographical memories and beliefs: A preliminary metacognitive model. In T. J. Perfect & B. L. Schwartz (Eds.), *Applied metacognition* (p. 121–145). Cambridge University Press. <https://doi.org/10.1017/CBO9780511489976.007>
- Nahari, G., & Vrij, A. (2014). Can I borrow your alibi? The applicability of the verifiability approach to the case of an alibi witness. *Journal of Applied Research in Memory and Cognition*, 3(2), 89–94. <https://doi.org/10.1016/j.jarmac.2014.04.005>
- Nahari, G., Vrij, A., & Fisher, R. P. (2012). Does the truth come out in the writing? SCAN as a lie detection tool. *Law and Human Behavior*. <https://doi.org/10.1007/s10979-011-9264-6>
- Nahari, G., Vrij, A., & Fisher, R. P. (2012). Exploiting liars' verbal strategies by examining the verifiability of details. *Legal and Criminological Psychology*, 19(2), 227–239. <https://doi.org/10.1111/j.2044-8333.2012.02069.x>

- Olson, E. A., & Charman, S. D. (2012). 'But can you prove it?' – examining the quality of innocent suspects' alibis. *Psychology, Crime & Law*, 18(5), 453–471. <https://doi.org/10.1080/1068316x.2010.505567>
- Olson, E. A., & Wells, G. L. (2004). What makes a good alibi? A proposed taxonomy. *Law and Human Behavior*, 28(2), 157–176. <https://doi.org/10.1023/b:lahu.0000022320.47112.d3>
- Simons, D. J., & Chabris, C. F. (2011). What People Believe about How Memory Works: A Representative Survey of the U.S. Population. *PLoS ONE*, 6(8), e22757. <https://doi.org/10.1371/journal.pone.0022757>
- Slamecka, N. J., & Graf, P. (1978). The generation effect: Delineation of a phenomenon. *Journal of Experimental Psychology: Human Learning & Memory*, 4(6), 592–604. <https://doi.org/10.1037//0278-7393.4.6.592>
- Sporer, S. L., & Schwandt, B. (2006). Paraverbal indicators of deception: a meta-analytic synthesis. *Applied Cognitive Psychology*, 20(4), 421–446. <https://doi.org/10.1002/acp.1190>
- Steller, M. (1989). Recent developments in statement analysis. In J. C. Yuille (Ed.), *Credibility assessment* (pp. 135-154). Kluwer. https://doi.org/10.1007/978-94-015-7856-1_8
- Strange, D., Dysart, J., & Loftus, E. F. (2014). Why errors in alibis are not necessarily evidence of guilt. *Zeitschrift Für Psychologie*, 222(2), 82–89. <https://doi.org/10.1027/2151-2604/a000169>
- Taylor, R., & Hick, R. F. (2007). Believed cues to deception: Judgments in self-generated trivial and serious situations. *Legal and Criminological Psychology*, 12(2), 321–331. <https://doi.org/10.1348/135532506x116101>
- Treat, N. J., & Reese, H. W. (1976). Age, pacing, and imagery in paired-associate learning. *Developmental Psychology*, 12(2), 119–124. <https://doi.org/10.1037//0012-1649.12.2.119>
- Tulving, E., & Thomson, D. M. (1973). Encoding specificity and retrieval processes in episodic memory. *Psychological Review*, 80(5), 352–373. <https://doi.org/10.1037/h0020071>
- Vrij, A. (2008). *Detecting lies and deceit : pitfalls and opportunities*. Wiley.
- Vrij, A., Akehurst, L., Soukara, S., & Bull, R. (2004). Let me inform you how to tell a convincing story: CBCA and reality monitoring scores as a function of age, coaching, and deception. *Canadian Journal of Behavioural Science / Revue*

Canadienne Des Sciences Du Comportement, 36(2), 113–126.
<https://doi.org/10.1037/h0087222>

Vrij, A., Fisher, R., Mann, S., & Leal, S. (2006). Detecting deception by manipulating cognitive load. *Trends in cognitive sciences*, 10(4), 141–142.
<https://doi.org/10.1016/j.tics.2006.02.003>

Vrij, A., Leal, S., Mann, S., & Fisher, R. (2012). Imposing cognitive load to elicit cues to deceit: inducing the reverse order technique naturally. *Psychology, Crime & Law*, 18(6), 579–594. <https://doi.org/10.1080/1068316x.2010.515987>

Wall, H. M., & Routowicz, A. (1987). Use of self-generated and others' cues in immediate and delayed recall. *Perceptual and Motor Skills*, 64(3), 1019–1022.
<https://doi.org/10.2466/pms.1987.64.3.1019>

Wang, D., Xiang, Z., & Fesenmaier, D. R. (2014). Smartphone use in everyday life and travel. *Journal of Travel Research*, 55(1), 52–63.
<https://doi.org/10.1177/0047287514535847>

Zuckerman, M., Koestner, R., & Driver, R. (1981). Beliefs about cues associated with deception. *Journal of Nonverbal Behavior*, 6(2), 105–114.
<https://doi.org/10.1007/bf00987286>

Appendices

Appendix A

Time 1 Online Questionnaire

Q3

The first set of questions relate to your perceptions of working in teams.

Q4 I usually enjoy working in a group

- 1 (Strongly Disagree) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Strongly Agree) (7)
-

Q5 I like to share my ideas with others in a group

- 1 (Strongly Disagree) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Strongly Agree) (7)
-

Q6 I enjoy tasks where people have to work together to achieve a goal

- 1 (Strongly Disagree) (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (Strongly Agree) (7)

End of Block: Default Question Block

Start of Block: Block 1

Q7

The questions below relate to working on the escape room activity.

Q8 Was your group able to finish the activity before running out of time?

Yes (1)

No (2)

Q9 I enjoyed working with my group today

1 (Strongly Disagree) (1)

2 (2)

3 (3)

4 (4)

5 (5)

6 (6)

7 (Strongly Agree) (7)

Q11 My group communicated effectively on the escape room activity

- 1 (Strongly Disagree) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Strongly Agree) (7)
-

Q12 The escape room activity was easier than I expected

- 1 (Strongly Disagree) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Strongly Agree) (7)
-

Q13 I could have completed this task alone

- 1 (Strongly Disagree) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Strongly Agree) (7)
-

Q15 Communicating with group members on Zoom was easy

- 1 (Strongly Disagree) (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (Strongly Agree) (7)

End of Block: Block 1

Start of Block: Block 2

Q16

The following questions relate to your current environment and how the COVID-19 pandemic has affected you

Q17 Please indicate where you are taking this study from?

Home (1)

School (2)

Office (3)

Other (4)

Q18 If 'Other', please state where you are (e.g., Friend's house, grandma's house etc)

Q19 Please indicate Neighborhood (i.e., where you are located at this moment)

Q20 Please indicate City

Q21 Please indicate State

Q22 Please indicate the address of your current location (*Note: Your information **will not** be shared with any third parties*)

Q23 Have you been taking part in virtual meetings over the past three months?

Yes (1)

No (2)

Q25 The COVID-19 pandemic has significantly affected my daily activities

- 1 (Strongly Disagree) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Strongly Agree) (7)
-

Q24 Please list some activities you were **NOT** able to do during the COVID-19 lockdown

Q26 If you were not taking part in this study, what would you usually be doing on this day at this time? Please list all activities (e.g., working out at the gym, buying groceries, etc.)

End of Block: Block 2

Start of Block: Block 3

Q27

The following questions relate to your future expectations regarding working in virtual teams

Q28 I am looking forward to having more virtual group meetings in the future

- 1 (Strongly Disagree) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Strongly Agree) (7)
-

Q29 I believe that virtual teams are superior than in-person teams

- 1 (Strongly Disagree) (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (Strongly Agree) (7)

Appendix B

Time 2 Online Questionnaire

Q32 Age

Q33 Gender

- Male (1)
 - Female (2)
 - Transgender Male (3)
 - Transgender Female (4)
 - Gender Variant / Non-conforming (5)
 - Other (6) _____
 - Prefer Not To Say (7)
-

Q34 Race / Ethnicity

- White (1)
- Hispanic or Latino (2)
- Black or African American (3)
- Native American (4)
- Native Hawaiian or Pacific Islander (5)
- Asian (6)
- Other (7) _____
- Prefer Not To Say (8)

End of Block: Default Question Block

Start of Block: Truth questions

Q5

*The following questions relate to your **TRUTHFUL** interview (i.e., about the interview where you told the truth to the interviewer)*

Q37 To what extent were you telling the truth during the truthful interview?

- 1 (Not truthful at all) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Very truthful) (7)
-

Q6 How convincing do you think the interviewer found your truthful story?

- 1 (Not convincing at all) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Very Convincing) (7)
-

Q7 What strategies did you use to remember your location and activities for the time you were asked about?

Q9 How difficult was it to come up with truthful answers regarding your activities and whereabouts?

- 1 (Not difficult at all) (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (Very Difficult) (7)

Q10 How motivated were you to convince the interviewer that you were telling the truth?

- 1 (Not motivated at all) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Very Motivated) (7)
-

Q11 Did the interviewer give you time (3 minutes) to prepare your truthful story?

- Yes, the interviewer gave me 3 minutes to prepare my story (1)
 - No, the interviewer did not give me 3 minutes to prepare my story (2)
-

Page Break

Q38

The following questions relate to your **TRUTHFUL** interview (i.e., about the interview where you told the truth to the interviewer)

Display This Question:

If Did the interviewer give you time (3 minutes) to prepare your truthful story? = Yes, the interviewer gave me 3 minutes to prepare my story

Q12 To what extent do you think having time to prepare your story was helpful in remembering your whereabouts and activities?

- 1 (Not helpful at all) (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (Very helpful) (7)

Display This Question:

If Did the interviewer give you time (3 minutes) to prepare your truthful story? = No, the interviewer did not give me 3 minutes to prepare my story

Q13 To what extent do you think having time to prepare your story would have been helpful in remembering your whereabouts and activities?

- 1 (Not helpful at all) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Very helpful) (7)
-

Q17 Please explain why

Q14 Did the interviewer allow you to use your phone to prepare your truthful story?

- Yes, the interviewer allowed me to use my phone (1)
 - No, the interviewer did not allow me to use my phone (2)
-

Page Break

Q39

The following questions relate to your **TRUTHFUL** interview (i.e., about the interview where you told the truth to the interviewer)

Display This Question:

If Did the interviewer allow you to use your phone to prepare your truthful story? = Yes, the interviewer allowed me to use my phone

Q15 To what extent do you think using your phone was helpful in remembering your whereabouts and activities? Also explain why below.

- 1 (Not helpful at all) (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (Very helpful) (7)

Display This Question:

If Did the interviewer allow you to use your phone to prepare your truthful story? = No, the interviewer did not allow me to use my phone

Q16 To what extent do you think using your phone would have been helpful in remembering your whereabouts and activities? Also explain why below.

- 1 (Not helpful at all) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Very helpful) (7)
-

Q18 Please explain why

Display This Question:

If Did the interviewer allow you to use your phone to prepare your truthful story? = Yes, the interviewer allowed me to use my phone

Q41 What kind of information did you access on your phone to help with providing a truthful story (e.g., text messages, photos, Facebook)?

Display This Question:

If Did the interviewer allow you to use your phone to prepare your truthful story? = No, the interviewer did not allow me to use my phone

Q42 What kind of information would you have accessed on your phone to help with providing a truthful story (e.g., text messages, photos, Facebook)?

End of Block: Truth questions

Start of Block: Lie Questions

Q19

*The following questions relate to your **DECEPTIVE** interview (i.e., about the interview where you lied to the interviewer)*

Q45 To what extent were you lying during the deceptive interview?

- 1 (Not lying at all) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Very much lying) (7)
-

Q20 How convincing do you think the interviewer found your deceptive story?

- 1 (Not convincing at all) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Very Convincing) (7)
-

Q21 What strategies did you use to lie about your location and activities for the time you were asked about?

Q22 How difficult was it to come up with deceptive answers regarding your activities and whereabouts?

- 1 (Not difficult at all) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Very Difficult) (7)
-

Q23 How motivated were you to convince the interviewer that you were telling the truth, even though you were lying?

- 1 (Not motivated at all) (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (Very Motivated) (7)

Q24 Did the interviewer give you time (3 minutes) to prepare your deceptive story?

- Yes, the interviewer gave me 3 minutes to prepare my story (1)
- No, the interviewer did not give me 3 minutes to prepare my story (2)
-

Page Break

Q43

The following questions relate to your **DECEPTIVE** interview (i.e., about the interview where you lied to the interviewer)

Display This Question:

If Did the interviewer give you time (3 minutes) to prepare your deceptive story? = Yes, the interviewer gave me 3 minutes to prepare my story

Q25 To what extent do you think having time to prepare your story was helpful in lying about your whereabouts and activities?

- 1 (Not helpful at all) (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (Very helpful) (7)

Display This Question:

If Did the interviewer give you time (3 minutes) to prepare your deceptive story? = No, the interviewer did not give me 3 minutes to prepare my story

Q26 To what extent do you think having time to prepare your story would have been helpful in lying about your whereabouts and activities?

- 1 (Not helpful at all) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Very helpful) (7)
-

Q27 Please explain why

Q28 Did the interviewer allow you to use your phone to prepare your deceptive story?

- Yes, the interviewer allowed me to use my phone (1)
 - No, the interviewer did not allow me to use my phone (2)
-

Page Break

Q44

The following questions relate to your **DECEPTIVE** interview (i.e., about the interview where you lied to the interviewer)

Display This Question:

If Did the interviewer allow you to use your phone to prepare your deceptive story? = Yes, the interviewer allowed me to use my phone

Q29 To what extent do you think using your phone was helpful in lying about your whereabouts and activities? Also explain why below.

- 1 (Not helpful at all) (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (Very helpful) (7)

Display This Question:

If Did the interviewer allow you to use your phone to prepare your deceptive story? = No, the interviewer did not allow me to use my phone

Q30 To what extent do you think using your phone would have been helpful in lying about your whereabouts and activities? Also explain why below.

- 1 (Not helpful at all) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Very helpful) (7)
-

Q31 Please explain why

Display This Question:

If Did the interviewer allow you to use your phone to prepare your deceptive story? = Yes, the interviewer allowed me to use my phone

Q46 What kind of information did you access on your phone to help with providing a deceptive story? (e.g., text messages, photos, Facebook)?

Display This Question:

If Did the interviewer allow you to use your phone to prepare your deceptive story? = No, the interviewer did not allow me to use my phone

Q47 What kind of information would you have accessed on your phone to help with providing a deceptive story? (e.g., text messages, photos, Facebook)?

End of Block: Lie Questions

Start of Block: Block 3

Q35

Thank you for completing this survey. Please hit next to ensure you receive credit for this study, and inform the experimenter that you have completed the survey.

End of Block: Block 3

Appendix C
Interview Scripts

Preparation with Phone Access (PPA) Interview Script

I. Welcome Remarks

Hi how are you doing?

[Neutral emotion - Not too friendly, not hostile]

I'm going to be asking you some questions about your whereabouts over the past week. Before we start, please position your zoom video in such a way that your arms are visible. I will be recording this interview.

[Make sure they adjust their camera. Start recording and choose CLOUD RECORDING, and ensure it is recording]

II. Interview Phase

Please tell me where you were and what you were doing on _____ (read day, date) from _____ to _____ (read times). Explain your whereabouts and activities to me in as much detail as possible and include information about any evidence and people that can support your story.

[Example: "I need you to tell me where you were and what you were doing on Friday, December 13th, 2019 from 6:30pm to 7:00pm"]

Before you provide your response, take some time to think about your answer. You can also check your phone for any information that could help you determine your whereabouts and activities. You can check your calendar, text messages, photos, call logs, social media, or anything on your phone that can help you provide me with the best information possible. You have a total of three minutes to check your phone and prepare your story. I will let you know when the three minutes are up.

[Look away and start a 3 minute timer]

The three minutes are up. Please tell me where you were and what you were doing on _____ (read day, date) from _____ to _____ (read times). Remember to explain your whereabouts and activities to me in as much detail as possible and to include information about any evidence and people that can support your story.

[Participant should respond immediately...]

[Proceed to follow up questions]

Is there anything else you want to add?

I have some follow up questions for you...

Follow up questions:

1. *Can you specify the exact location of your whereabouts for me? Can you give me an address, a specific landmark, or neighbourhood of where you were?*

[Answer any questions to clarify, and lock in the location for their whereabouts]

2. *Please specify exactly what you were doing at this location at that time.*

3. *Can you tell me of any physical evidence that exists and can support your story? By physical evidence it could be any material substance such as a ticket, receipt or anything that can prove that you were in that location.*

[Ask open ended questions to understand what that evidence is (e.g., what was the ticket/receipt for?) If the participant says ‘I don’t know’, you can move on to the next question.]

4. *Now tell me who can support your story? Please be as specific as possible about the identities of each person you mention. For example, you could provide a full name and how you know this individual. If you do not know their name, you can provide a physical description and information that could help locate this person.*

[Follow up questions for clarity as needed. If the participant says ‘I don’t know’, you can move on to the next question.]

5. *This story you have just told me, are you basing this from a specific memory or are you inferring your whereabouts and activities based on other information?*

[Response to this can range, but should address whether its from memory or inferences. Not Sure response is allowable]

[If they say “Other Information”, ask “What is this information.]

6. *On a scale from 0-100%, how confident are you that this story is accurate?*

[Participants may say two numbers e.g. 50-60 percent. You should say: Please indicate a single number between 0 and 100]

Is there anything you’d like to add?

[Participant responds]

Thanks for answering these questions. I'll let the experimenter know we are done with this part of the interview.

[Stop the recording]

[Return to the breakout room and inform the experimenter that you are done]

II. Second Interviews

Let's continue this with the interview.

[Start recording interview, choose CLOUD RECORDING]

Please tell me where you were and what you were doing on _____ (read day, date) from _____ to _____ (read time). Explain your whereabouts and activities to me in as much detail as possible and include information about any evidence and people that can support your story.

Before you provide your response, take some time to think about your answer. You also check your phone for any information that could help you determine your whereabouts and activities. You can check your calendar, text messages, photos, call logs, social media, or anything that can help you provide me with the best information possible. You have a total of three minutes to check your phone and prepare your story. I will let you know when the three minutes are up.

[Look away and start a 3 minute timer]

The three minutes are up. Please tell me where you were and what you were doing on _____ (read day, date) from _____ to _____ (read times). Remember

to explain your whereabouts and activities to me in as much detail as possible and to include information about any evidence and people that can support your story.

[Participant should respond immediately...]

Is there anything else you want to add?

I have some follow up questions for you...

Follow up questions:

1. *Can you specify the exact location of your whereabouts for me? Can you give me an address, a specific landmark, or neighbourhood of where you were?*

[Answer any questions to clarify, and lock in the location for their whereabouts]

2. *Please specify exactly what you were doing at this location at that time.*
3. *Can you tell me of any physical evidence that exists and can support your story? By physical evidence it could be any material substance such as a ticket, receipt or anything that can prove that you were in that location.*

[Ask open ended questions to understand what that evidence is (e.g., what was the ticket/receipt for?) If the participant says ‘I don’t know’, you can move on to the next question.]

Is there anything you’d like to add?

4. *Now tell me who can support your story? Please be as specific as possible about the identities of each person you mention. For example, you could provide a full*

name and how you know this individual. If you do not know their name, you can provide a physical description and information that could help locate this person.

[Follow up questions for clarity as needed. If the participant says ‘I don’t know’, you can move on to the next question.]

5. *This story you have just told me, are you basing this from a specific memory or are you inferring your whereabouts and activities based on other information?*

[Response to this can range, but should address whether its from memory or inferences. Not Sure response is allowable]

[If they say “Other Information”, ask “What is this information.]

6. *On a scale from 0-100%, how confident are you that this story is accurate?*

[Participants may say two numbers e.g. 50-60 percent. You should say: Please indicate a single number between 0 and 100]

Is there anything you’d like to add?

[Participant responds]

Thanks for answering these questions. I’ll let the experimenter know we are done with the interview.

[Stop Recording]

[Return to the breakout room and inform the experimenter that you are done]

Preparation Only (PO) Interview Script

I. Welcome Remarks

Hi how are you doing?

[Neutral emotion - Not too friendly, not hostile]

I'm going to be asking you some questions about your whereabouts over the past week. Before we start, please position your zoom video in such a way that your arms are visible. I will be recording this interview.

[Make sure they adjust their camera. Start recording and choose CLOUD RECORDING, and ensure it is recording]

II. Interview Phase

Please tell me where you were and what you were doing on _____ (read day, date) from _____ to _____ (read times). Explain your whereabouts and activities to me in as much detail as possible and include information about any evidence and people that can support your story.

[Example: "I need you to tell me where you were and what you were doing on Friday, December 13, 2019 from 6:30pm to 7:00pm"]

Before you provide your response, take some time to think about your answer. You have a total of three minutes to prepare your story. During this time, you are not allowed to use any materials such as a phone or computer. I will let you know when the three minutes are up.

[Look away and start a 3 minute timer]

The three minutes are up. Please tell me where you were and what you were doing on _____ (read day, date) from _____ to _____ (read times). Remember to explain your whereabouts and activities to me in as much detail as possible and to include information about any evidence and people that can support your story.

[Participant should respond immediately...]

Is there anything else you want to add?

I have some follow up questions for you...

[Proceed to follow up questions]

Follow up questions:

1. *Can you specify the exact location of your whereabouts for me? Can you give me an address, a specific landmark, or neighbourhood of where you were?*

[Answer any questions to clarify, and lock in the location for their whereabouts]

2. *Please specify exactly what you were doing at this location at that time.*
3. *Can you tell me of any physical evidence that exists and can support your story? By physical evidence it could be any material substance such as a ticket, receipt or anything that can prove that you were in that location.*

[Ask open ended questions to understand what that evidence is (e.g., what was the ticket/receipt for?) If the participant says 'I don't know', you can move on to the next question.]

4. *Now tell me who can support your story? Please be as specific as possible about the identities of each person you mention. For example, you could provide a full name and how you know this individual. If you do not know their name, you can provide a physical description and information that could help locate this person.*

[Follow up questions for clarity as needed. If the participant says ‘I don’t know’, you can move on to the next question.]

5. *This story you have just told me, are you basing this from a specific memory or are you inferring your whereabouts and activities based on other information?*

[Response to this can range, but should address whether its from memory or inferences. Not Sure response is allowable]

[If they say “Other Information”, ask “What is this information?”.]

6. *On a scale from 0-100%, how confident are you that this story is accurate?*

[Participants may say two numbers e.g. 50-60 percent. You should say: Please indicate a single number between 0 and 100]

Is there anything you’d like to add?

[Participant responds]

Thanks for answering these questions. I’ll let the experimenter know we are done with this part of the interview.

[Stop the recording]

[Return to the breakout room and inform the experimenter that you are done]

II. Second Interview

Let's continue this with the interview.

[Start recording interview, choose CLOUD RECORDING]

Please tell me where you were and what you were doing on _____ (read day, date) from _____ to _____ (read time). Explain your whereabouts and activities to me in as much detail as possible and include information about any evidence and people that can support your story.

Before you provide your response, take some time to think about your answer. You have a total of three minutes to prepare your story. During this time, you are not allowed to use any materials such as a phone or computer. I will let you know when the three minutes are up.

[Look away and start a 3 minute timer, Make sure participant is still on video]

The three minutes are up. Please tell me where you were and what you were doing on _____ (read day, date) from _____ to _____ (read times). Remember to explain your whereabouts and activities to me in as much detail as possible and to include information about any evidence and people that can support your story.

[Participant should respond immediately...]

Is there anything else you want to add?

I have some follow up questions for you...

[Proceed to follow up questions]

Follow up questions:

1. *Can you specify the exact location of your whereabouts for me? Can you give me an address, a specific landmark, or neighbourhood of where you were?*

[Answer any questions to clarify, and lock in the location for their whereabouts]

2. *Please specify exactly what you were doing at this location at that time.*
3. *Can you tell me of any physical evidence that exists and can support your story? By physical evidence it could be any material substance such as a ticket, receipt or anything that can prove that you were in that location.*

[Ask open ended questions to understand what that evidence is (e.g., what was the ticket/receipt for?) If the participant says ‘I don’t know’, you can move on to the next question.]

4. *Now tell me who can support your story? Please be as specific as possible about the identities of each person you mention. For example, you could provide a full name and how you know this individual. If you do not know their name, you can provide a physical description and information that could help locate this person.*

[Follow up questions for clarity as needed. If the participant says ‘I don’t know’, you can move on to the next question.]

5. *This story you have just told me, are you basing this from a specific memory or are you inferring your whereabouts and activities based on other information?*

[Response to this can range, but should address whether its from memory or inferences. Not Sure response is allowable]

[If they say “Other Information”, ask “What is this information?”.]

6. *On a scale from 0-100%, how confident are you that this story is accurate?*

[Participants may say two numbers e.g. 50-60 percent. You should say: Please indicate a single number between 0 and 100]

Is there anything you'd like to add?

[Participant responds]

Thanks for answering these questions. I'll let the experimenter know we are done with this part of the interview.

[Stop Recording]

[Return to the breakout room and inform experimenter that you are done]

Control Interview Script

I. Welcome Remarks

Hi how are you doing?

[Neutral emotion - Not too friendly, not hostile]

I'm going to be asking you some questions about your whereabouts over the past week. Before we start, please position your zoom video in such a way that your arms are visible. I will be recording this interview.

[Make sure they adjust their camera. Start recording and choose CLOUD RECORDING, and ensure it is recording]

II. Interview Phase

Please tell me where you were and what you were doing on _____ (read day, date) from _____ to _____ (read times). Explain your whereabouts and activities to me in as much detail as possible and include information about any evidence and people that can support your story. You are not allowed to use any materials such as a phone or laptop at any point during this interview.

[Example: "I need you to tell me where you were and what you were doing on Friday, December 13, 2019 from 6:30pm to 7:00pm".]

[Participant should respond immediately]

Is there anything else you want to add?

I have some follow up questions for you...

[Proceed to follow up questions]

Follow up questions:

1. *Can you specify the exact location of your whereabouts for me? Can you give me an address, a specific landmark, or neighbourhood of where you were?*

[Answer any questions to clarify, and lock in the location for their whereabouts]

2. *Please specify exactly what you were doing at this location at that time.*
3. *Can you tell me of any physical evidence that exists and can support your story? By physical evidence it could be any material substance such as a ticket, receipt or anything that can prove that you were in that location.*

[Ask open ended questions to understand what that evidence is (e.g., what was the ticket/receipt for?) If the participant says ‘I don’t know’, you can move on to the next question.]

4. *Now tell me who can support your story? Please be as specific as possible about the identities of each person you mention. For example, you could provide a full name and how you know this individual. If you do not know their name, you can provide a physical description and information that could help locate this person.*

[Follow up questions for clarity as needed. If the participant says ‘I don’t know’, you can move on to the next question.]

5. *This story you have just told me, are you basing this from a specific memory or are you inferring your whereabouts and activities based on other information?*

[Response to this can range, but should address whether its from memory or inferences. Not Sure response is allowable]

[If they say “Other Information”, ask “What is this information?”.]

6. *On a scale from 0-100%, how confident are you that this story is accurate?*

[Participants may say two numbers e.g. 50-60 percent. You should say: Please indicate a single number between 0 and 100]

Is there anything you'd like to add?

[Participant responds]

Thanks for answering these questions. I'll let the experimenter know we are done with this part of the interview.

[Stop the recording]

[Return to the breakout room and inform the experimenter that you are done]

II. Second Interview

Let's continue this with the interview.

[Start recording interview, choose CLOUD RECORDING]

Please tell me where you were and what you were doing on _____ (read day, date) from _____ to _____ (read time). Remember to explain your whereabouts and activities to me in as much detail as possible and to include information about any evidence and people that can support your story.

[Participant should respond immediately...]

Is there anything else you want to add?

I have some follow up questions for you...

[Proceed to follow up questions]

Follow up questions:

1. *Can you specify the exact location of your whereabouts for me? Can you give me an address, a specific landmark, or neighbourhood of where you were?*

[Answer any questions to clarify, and lock in the location for their whereabouts]

2. *Please specify exactly what you were doing at this location at that time.*
3. *Can you tell me of any physical evidence that exists and can support your story? By physical evidence it could be any material substance such as a ticket, receipt or anything that can prove that you were in that location.*

[Ask open ended questions to understand what that evidence is (e.g., what was the ticket/receipt for?) If the participant says ‘I don’t know’, you can move on to the next question.]

4. *Now tell me who can support your story? Please be as specific as possible about the identities of each person you mention. For example, you could provide a full name and how you know this individual. If you do not know their name, you can provide a physical description and information that could help locate this person.*

[Follow up questions for clarity as needed. If the participant says ‘I don’t know’, you can move on to the next question.]

5. *This story you have just told me, are you basing this from a specific memory or are you inferring your whereabouts and activities based on other information?*

[Response to this can range, but should address whether its from memory or inferences. Not Sure response is allowable]

[If they say “Other Information”, ask “What is this information?”.]

6. *On a scale from 0-100%, how confident are you that this story is accurate?*

[Participants may say two numbers e.g. 50-60 percent. You should say: Please indicate a single number between 0 and 100]

Is there anything you’d like to add?

[Participant responds]

Thanks for answering these questions. I’ll let the experimenter know we are done with this part of the interview.

[Stop Recording]

[Return to the breakout room and inform experimenter that you are done]

Appendix D

Interrater Reliability for Deception Strategy Coding

Deception Strategy	Cronbach's alpha
Previously experienced event	.78
Plausible story	.70
Keeping it simple	.99
What people normally do	.80
Something close to the truth	.94
Very detailed	.80
Impression management	.74

Appendix E

Study 2 Dependent Measures

Alibi Using your best judgment, how would you categorize this individual?

- honest and accurate (1)
 - honest but mistaken (2)
 - deceptive (3)
-

PPAha confident How confident are you in your categorization?

0 10 20 30 40 50 60 70 80 90 100



To what extent is the individual in the video lying?

- 1 (Definitely telling the truth) (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (Definitely lying) (7)

To what extent is the individual's alibi believable?

- 1 (Not believable at all) (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 (5)
 - 6 (6)
 - 7 (Very believable) (7)
-

When making your categorization, to what extent did you **rely** on the following cues?

	1 (Not at all) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (To a great extent) (7)
Physical evidence mentioned that can support the alibi (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People mentioned who can support the story (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of detail provided (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The way the individual spoke (e.g., fluency) (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Individual's body language (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Individual's confidence (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How easily the individual came up with the alibi (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Using your best judgment, how would you categorize this individual? = honest and accurate

Please explain why you thought the individual was "honest and accurate".

Display This Question:

If Using your best judgment, how would you categorize this individual? = honest but mistaken

Please explain why you thought the individual was "honest but mistaken".

Display This Question:

If Using your best judgment, how would you categorize this individual? = deceptive

Please explain why you thought the individual was "deceptive".

To what extent did the individual **display** the following traits?

	1 (Not at all) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (Very Much) (7)
Helpfulness (i.e., they were making an effort to provide good information to the interviewer) (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nervousness (i.e., they were nervous when reporting their alibi) (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Confidence (i.e., they were confident when reporting their alibi) (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thoughtfulness (i.e., they were thinking hard when reporting their alibi) (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friendliness (i.e., they were friendly to the interviewer when reporting their alibi) (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fluency (i.e., they reported their alibi in a fluent way to the	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

interviewer)
(6)

How difficult was it for the individual to come up with the alibi?

- 1 (Very easy) (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (Very Difficult) (7)

Appendix F

Evaluator Instructions

Instructions You are about to watch a series of videos of different individuals being questioned about their whereabouts and activities (i.e., their alibi). The period they are being asked about is between **1 and 2 weeks before the date of the interview**.

Your role is to imagine that each of these individuals is suspected of committing a crime, and it is your task to evaluate their alibi: their story regarding their whereabouts and activities at the time of the crime.

When people give alibis, they fall into one of the following categories:

1. They can be honest that they are innocent, and accurate about their whereabouts and activities at the time of the crime (i.e., **honest and accurate**)
2. They can be honest that they are innocent, but mistaken about their whereabouts and activities at the time of the crime (i.e., **honest but mistaken**)
3. They can be guilty of the crime, and deceptive about their whereabouts and activities at the time of the crime (i.e., **deceptive**)

You will be shown 5 videos of people reporting their alibis, and you will be asked to indicate whether the individuals are **honest and accurate**, **honest but mistaken**, or **deceptive**.

Page Break

Instruction Example

Please read the example below:

Imagine that a briefcase was stolen from an office and some individuals are interviewed as suspects to the crime. Individuals being interviewed may potentially respond in any one of the three ways described below:

One individual may be innocent (i.e., did not steal the briefcase at the office), and correctly reports that they were at the dentist's office at the time of the crime. This individual is **honest and accurate**.

One individual may be innocent (i.e., did not steal the briefcase at the office), but mistakenly reports being at home at the time of the crime, yet they were actually at a friend's house when the crime was taking place. This individual is **honest but mistaken**.

One individual may be guilty (i.e., stole the briefcase at the office) and when interviewed, falsely reports being at a friend's house at the time of the crime. This individual is **deceptive**.

Your role in this study is to watch 5 videos of individuals being interviewed regarding their alibis, and to determine whether they are **honest and accurate, honest but mistaken, or deceptive**.

VITA

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- 2016 B.A., Social and Cognitive Psychology
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- 2019 M.S., Psychology
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PUBLICATIONS AND PRESENTATIONS

Matuku, K., & Charman, S. D. (2020). Enhancing innocent suspects' memories for corroborating alibi evidence. *Psychology, Public Policy, and Law*, 26(4), 442–454. <https://doi.org/10.1037/law0000264>

Charman, S. D., Matuku, K., & Mook, A. (2019). Non-blind lineup administration biases administrators' interpretations of ambiguous witness statements and their perceptions of the witness. *Applied Cognitive Psychology*, 33(6), 1260-1270. <https://doi.org/10.1002/acp.3579>

Charman S., Matuku K., Mosser A. (2019). The Psychology of Alibis. In: Bornstein B., Miller M. (eds) *Advances in Psychology and Law*. *Advances in Psychology and Law*, vol 4. Springer, Cham. https://doi.org/10.1007/978-3-030-11042-0_2

Matuku, K., & Charman, S. D. (2020). *Improving the believability of innocent suspect's alibis and an examination of overconfidence*. Paper to be presented at the meeting for the American Psychology - Law Society, New Orleans, LO.

Matuku, K., Charman, S., & Bradfield Douglass, A. (2020). *Investigating nonverbal cues to witness accuracy and the impact of video-recording on witness behavior*. Paper to be presented at the meeting for the American Psychology - Law Society, New Orleans, LO.

Shaffer, S., Matuku, K., & Evans, E. (2020). *Eliciting Intelligence from Sources With Repeated Interviewing*. Paper to be presented at the meeting for the American Psychology - Law Society, New Orleans, LO.

Shaffer, S., Matuku, K., & Evans, E. (2020). *Source Counter-Interrogation and Withholding Strategy Use in Human Intelligence Interrogations*. Poster to be presented at the meeting for the American Psychology - Law Society, New Orleans, LO.

Mulligan, J.F., Bradfield Douglass, A., Charman, S., Matuku, K., & Lamere, E., (2020). *Evaluating Witness Accuracy: Video Recording Identification Procedures and Contextual Information*. Poster to be presented at the meeting for the American Psychology - Law Society, New Orleans, LO.

Matuku, K., & Charman, S. (2019). *Enhancing memory for alibi evidence*. Paper presented at the meeting for the American Psychology - Law Society, Portland, OR.

Matuku, K., Bradfield Douglass, A., & Charman, S. (2018, March). *A cautionary note about videotaped eyewitness identification procedures*. Paper presented at the meeting for the American Psychology – Law Society, Memphis, TN.

Shaffer, S., Matuku, K., & Evans, E. (2018, March). *Intelligence-gathering approaches for more and less capable sources: A comparison of the Scharff technique with accusatory and direct interview techniques*. Paper presented at the meeting for the American Psychology – Law Society, Memphis, TN.

Mook, A., Charman, S., & Matuku, K. (2018, March). *Non-blind lineup administration and the interpretation of ambiguous witness statements*. Poster presented at the meeting for the American Psychology – Law Society, Memphis, TN.

Shaffer, S., Matuku, K., & Evans, E. (2017, June). *Intelligence-gathering approaches for more and less capable sources: A comparison of the Scharff technique with accusatory and direct interview techniques*. Paper presented at the International Investigative Interviewing Research Group, Monterrey, CA.

Wilford, M. M., Charman, S. D., Shaffer, S. A., Cotrupi, C. J., Matuku, K., Borrero, C., & Khairalla, A. (2017, March). *“What a horrible photo!”: Improving eyewitness accuracy with additional lineup photos?* Paper presented at the meeting for the American Psychology – Law Society, Seattle, WA.

Charman, S., Matuku, K., & Mook, A. (2017, March). *Non-blind lineup administration and the interpretation of ambiguous witness statements*. Paper presented at the meeting for the American Psychology – Law Society, Seattle, WA.