6-26-2020

Informants' Memory for Conversations: The Examination of the Investigative Utility of the Cognitive Interview

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INFORMANTS' MEMORY FOR CONVERSATIONS: THE EXAMINATION OF THE INVESTIGATIVE UTILITY OF THE COGNITIVE INTERVIEW

A dissertation submitted in partial fulfillment of

the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

PSYCHOLOGY

by

Danielle Sneyd

2020

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

This dissertation, written by Danielle Sneyd, and entitled Informants' Memory for Conversations: The Examination of the Investigative Utility of the Cognitive Interview, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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Date of Defense: June 26, 2020

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Florida International University, 2020

DEDICATION

“I want to thank me for believing in me, I want to thank me for doing this hard work, I want to thank me for having no days off."—Snoop Dogg, 2018

This dissertation is also dedicated to my parents. Thank you for believing in my capabilities and supporting me in my search for knowledge, however far it may take me from home.

I would also like to dedicate this dissertation to Keith. Thank you for your friendship and for not getting tired of all my questions. Without your keen eye for detail this manuscript would have never made it past the formatting stages.

ACKNOWLEDGMENTS

This project would not have been possible without the help and support of many individuals. First, I want to thank my professors and committee members. Dr. Nadja Schreiber Compo, thank you for your continued support and determination. Thank you for always reminding me to take time for myself. Dr. Debbie Goldfarb, thank you for always challenging me to do more, both academically and for my students. I will always appreciate your advice and support during my job search. Dr. Jacki Evans, thank you for your expertise and feedback (and letting me watch Maya). You are the glue that holds our department together. Dr. Rob Guerette, thank you for your enthusiasm for my project and your outside perspective. Your advice and feedback helped me to create a more dynamic project. And a special thank you to Dr. Ron Fisher: Thank you for your support and your feedback for the past four years. You have made me a better writer and taught me the importance of a good pilot test. I will keep my list of "Ron approved writing tips" close as I start my next journey. Thank you.

Thank you to my office mate Andrea, your friendship over the last four years has saved my sanity on more than one occasion. Thank you for helping me improve my teaching and for always being willing to attend another workshop. Thank you to my cohort members Alexis and Kureva, I would be lost without your continued friendship and support. We almost made it! Thank you to my roommate Kelsey who was always willing to go on an adventure (even if that adventure was just to the grocery store). I also want to thank all my legal friends: Amelia, Sarah, Laura, Stefanie, Cassidy, Devon, Tori, Haley, and Hana—you all made showing up at the office worth it. I can't wait to see the greatness you will all accomplish.

I also want to thank my wonderful team of research assistants; without your dedication this project may not have been finished on time. Thank you to: Julie Ricardo, Emma Macinski, Ramza Barbosa, Jonah Serrano, Shedner Agenor, A'mani Taylor, Francisco Saravia, Valerie Caso, Madison Smith, and Michelle Casanas.

ABSTRACT OF THE DISSERTATION

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In human-intelligence-gathering contexts, informants or persons of interest are often interviewed about a conversation they overheard. The information gathered from these conversations may be important for national security, and therefore, the most accurate information needs to be elicited. The current project consisted of two studies that extended the previous literature on the Cognitive Interview (CI). Study 1 (1) tested the CI (compared to a structured interview, SI) in the context of memory for conversations and (2) investigated the effects of modality by comparing in-person interviews to telephone interviews. The CI is a theory-based interview protocol that has been shown to enhance witness recall but can also be used in a variety of contexts outside the legal system, as it is a process-oriented approach to interviewing (Fisher & Geiselman, 2019). However, little research has been conducted on memory for conversations, with even fewer studies using the most updated version of the CI to enhance memory recall for conversations. The current study was the first to compare in-person and telephone interviews on the amount of information gathered. In Study 1, the CI elicited more correct details than the SI, suggesting that the CI is an effective tool for eliciting

conversation details. In addition, there were no significant effects of modality, suggesting that interviewers will not lose vital information when conducting an interview over the telephone (compared to in-person). Interviews from Study 1 were transcribed and presented to other student participants (Study 2)—playing the role of law enforcement analysts—to see if the CI-generated details could help the analysts stop an upcoming crime. (In the real-world, analysts assist interviewers to interpret information and help make decisions about future actions and disseminate the information to the broader intelligence and law enforcement communities; Russano et al., 2014.) Results of Study 2 suggest that the type of coding scheme used (strict vs. lenient) may affect the potency of the CI effect. The CI's superiority over the SI occurred when a strictly coded response was required, which suggests that the CI will be most useful for crime solutions that required detailed descriptions.

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ABBREVIATIONS AND ACRONYMS

Analysis of variance	ANOVA
Cognitive interview	CI
Intraclass correlation	ICC
Mean	M
Standard deviation	SD
Structured Interview	SI

I. INTRODUCTION

In real-life investigations, where informants are used, interviewers will sometimes ask informants to recall information that they have overheard in conversation. Examples could include both intentional information gathering, where the informant goes to a specific location to overhear important information, or passive information gathering, in which the informant has already overheard the information but may not have known at the time of encoding that it was important. The information gathered from these overheard conversations may be important for national security, and therefore, it is vital that the most accurate information is remembered and reported. Incorrect or incomplete information could lead to severe consequences for both national security and people's lives.

Interviewers in human-intelligence-gathering contexts work closely with analysts to gather and interpret information that relates to public safety or national security (Russano et al., 2014). Once the interviewer has gathered the information from the informant the analyst will assist to interpret the information to help make decisions about future actions and disseminate the information to the broader intelligence and law enforcement communities (Russano et al., 2014).

The goal of the current study was to develop better interviewing techniques to elicit more accurate information about conversations, which can then be used to help analysts more efficiently solve work-related problems (e.g., allocating resources or determining which terrorist organization is an imminent threat). Specifically, the current study sought to test the Cognitive Interview (CI) for its ability to help enhance memory for conversations. The CI has been shown to increase memory recall for events by

approximately 35%-50% compared to a standard interview (Fisher & Geiselman, 2018). Little research, however, has been conducted on memory for conversations, with even fewer studies using the most updated version of the CI (Fisher & Geiselman, 2019) to enhance memory recall for conversations. The current study aimed to use the most updated version of the CI and was tailored to remembering conversations. The current CI was predicted to increase correct recall compared to a structured control interview (SI).

Frequently, informants are uniquely situated to assist the FBI in its most sensitive investigations, as they may be involved in criminal activities or enterprises and may be recruited by the FBI because of their access and status (OIG, 2005). As informants may still be in contact with the criminals they are informing against, it is important for the FBI to help preserve their anonymity. One way to maintain anonymity is by using telephone interviews. Telephone interviews help law enforcement officers gain the information they need while reducing the risk informants might face if their identity was discovered by their criminal associates. Law enforcement officers have expressed concern that advanced interviewing techniques, like the CI, will not be as beneficial over the telephone as they are in-person compared to basic interviewing techniques (Fisher, personal correspondence). The current study examined the concern of interviews being conducted over the telephone by manipulating the modality of the interview (i.e., either by telephone or in-person).

A second aim of the current study was to test the investigative utility of the CI (i.e., how helpful the additional information produced by the CI is to investigators to solve crimes). Currently, very little research has been conducted on the investigative utility of the CI. It could be assumed that the additional details that the CI produces

compared to a SI have investigative utility because having more information *should* be more beneficial than having less information. However, it is possible that the additional information may not be helpful to law enforcement. For instance, the additional information may be vague, repetitive, or irrelevant, which would not assist law enforcement officers in their daily tasks. For example, a witness who describes scene-related details in addition to perpetrator-related details is providing more information to the investigator than a witness who just describes the perpetrator. However, these additional details about the scene may not help investigators apprehend the perpetrator. Therefore, the investigative utility of the CI needs to be tested empirically. Law enforcement officers have no reason to switch from their current investigative procedures if research cannot demonstrate the investigative utility of the CI. However, if the additional CI-generated details prove to be beneficial to practitioners doing their jobs then the increase in investigative utility lends additional support for using the CI in the field.

The current paper will first discuss the prior research on memory for conversations (i.e., context in which memory for conversations has been studied, methodologies used, and general findings). Then it will discuss prior research that has investigated methods that have been shown to increase memory for conversations, specifically the CI and its relevant techniques. Then it will discuss the utility of the CI and the additional details it helps to produce. Finally, it will discuss the relevant research on telephone interviews.

Importance of Memory for Conversations

Human-intelligence gathering is not the only context in which memory for

conversations is important. Memory for conversations can also be important for business negotiations when one party may make promises to another, or when harassing statements made in a work environment must be recalled (Campos & Alonso-Quecuty, 2006). Often, cases of suspected child sexual abuse will come to light through children's disclosures to parents or teachers (London, Bruck, Ceci & Shuman, 2005). These adults subsequently report the conversations to the authorities. Additional research has found that adolescents disclose abuse most often to a peer their own age (Priebe & Svedin, 2008). In all of these cases the accuracy of the adult's or peer's memory of the disclosure conversation can play a crucial factor in the next steps after reporting (i.e., filing legal action, reliability/admissibility of testimony in court). It is thus important to understand how much people remember of conversations, the accuracy of the recollections, and ways in which we can improve people's recollections about these conversations. The quantity of reported details and accuracy of those details can be important in legal settings as shown in the above examples, but also for the military or security contexts, in which people's safety could be at risk without obtaining plentiful and accurate information.

Memory for Conversations

What is remembered? Most of the previous research on memory for conversations was motivated by children's disclosures of sexual abuse. Research has indicated that adults tend to have difficulty remembering whether children's statements from an earlier conversation originated spontaneously—in response to neutral questions—or through leading questions (Bruck, Ceci, & Francoeur, 1999; Lamb, Orbach, Sternberg, Herschkowitz, & Horowitz, 2000). When adults have trouble remembering the source of statements in question, a misattribution of the source can

make it appear that the child brought up allegations of abuse, which could have severe consequences in a court of law (i.e., someone could be arrested and plead guilty or be tried). In fact, however, the parent or law enforcement officer may have first introduced the abuse claim through leading questions which may lower the reliability of the child's report.

Misattributions of sources (i.e., source monitoring errors) can influence how reliable a given testimony is perceived. Research on conversations has thus examined the influence of different types of recall (free vs. cued) on source misattributions. In a study conducted by Korkman and colleagues (2015), participants overheard a mother-daughter conversation concerning suspected child sexual abuse. After overhearing the conversation, participants were asked to report "what the child told" during the conversation (compared to what "the mother told"). Participants attributed much of the information originally stated by the mother as information first mentioned by the child (37% accuracy rate). However, when participants were given a list of utterances and asked to determine the source of a specific utterance, they were much better at source monitoring in the cued recall task (66% accuracy rate) than during the free recall task (37% accuracy rate) (Korkman et al., 2015). In congruence with past research on source monitoring, the source-identification questions make the source more salient, which explains the increase in correct recall when the format switches from free-recall to cued-recall. Not remembering the source of the recalled information can become a problem when these statements are being used as evidence in a court of law–but only when the source of the information is critical. If the jury/ or judge only needs to know the general pattern of the conversation, source may not be as critical. In the current study, the facts

that are reported are more critical than the source of the facts and thus source monitoring errors are not a primary focus.

One reason people are better at remembering the general patterns of a conversation rather than the exact dialogue of the conversation is that memory largely contains gist recall (semantic meanings of the memory) as compared to verbatim memory (exact representation of the memory) (Brainerd & Reyna, 1990). Fuzzy-Trace Theory posits that during encoding of to-be-remembered material, verbatim and gist traces are formed in parallel, but then as time passes only the gist memory remains (Brainerd & Reyna, 1995; Garrod & Trabasso, 1973). The preservation of gist traces over time is critical because undercover informants are not always interviewed immediately after hearing an important conversation. In human-intelligence-gathering situations, informants may be interviewed about an event or meeting that happened months prior. Because of the delay between encoding and recall, the information recalled is usually the gist version of the event/meeting (as compared to a verbatim version). For example, if an investigator is trying to prevent a terrorist group from planning a bomb attack on an American base overseas, knowledge of the threat is of critical value. When the content of the threat is most important, investigators are focused on preventing the upcoming attack, even if the only information gathered is gist recall. The investigators may use the information gathered by the informant (time and location of the upcoming attack) to collect additional evidence which will then be used to allocate appropriate resources to prevent the attack.

Recent research on memory for conversations has focused on the influence of mode of presentation on recall (i.e., visual and auditory displays of the conversation).

Campos and Alonso-Quecuty (2006) manipulated the presentation of the conversation, such that participants either both saw and heard the conversation or just heard the conversation, and the retention interval, such that participants were interviewed either immediately or after a 4-day delay. An interaction was found such that the mode of presentation did not matter in the immediate condition, but, after a delay, participants recalled more correct information in the audio-visual condition than in the auditory-only condition. Not surprisingly, participants' overall recall for the conversation was better when questioned immediately than it was after a delay. The pattern of results suggests that when a delay is present participants have better memories for the conversation when the conversations can be encoded two ways (both auditory and visual components) instead of just one way (auditory-only). The current study utilized the auditory-only mode of presentation for all the conversations, as it aimed to look at recall of the conversation only, and not also recall of the event/speaker's appearance.

Another area of research within memory for conversations has been response format such that participants who witnessed a conversation were asked to recall the information either orally or in writing (Stafford & Daly, 1984). Overall, participants recalled an average of 10% of the original conversation. Participants who recalled the conversation orally produced more information, including more relevant conversation details, more redundant units, and more elaborations, than those who recalled the information in writing. The authors attributed the increase in orally reported details compared to written details to the fact that writing imposes a more formal structure that may prohibit the stream of ideas that occur naturally when reporting orally (Stafford & Daly, 1984). The same pattern of findings (lower recall for written vs. oral recall) was

replicated in a later study that added a condition with a 1-month delay in which recall dropped: The delay condition reported a larger drop in recall when written recall was used than the immediate condition (Stafford et al., 1987). With such low levels of overall recall, it is imperative for future research, including the current study, to develop ways to increase recall for conversations.

Research about memory recall tends to focus on two main analyses: (1) how much of the conversation is remembered (quantity) and (2) the accuracy of the overall report. The previously mentioned research on conversations tended to focus on the quantity of correct details reported, largely ignoring incorrect responses that contribute to inaccuracy. However, the accuracy of what was reported can be used to evaluate the reliability or trustworthiness of someone's recall. For example, if an informant reports 100 details, but only 30% of those details are accurate, investigators will not be able to use the information to successfully stop an upcoming attack. Both quantity and accuracy analyses are important to consider in the current context of human-intelligence-gathering.

Although previous research has shown low quantity rates of recall for conversations, more recent research has also focused on accuracy rates of that recall, which are generally high. In a study conducted by Bruck and colleagues (1999) mothers interviewed their children about a structured game event that the child took part in earlier that day. The structured game event consisted of various activities, such as playing with play dough, which the children completed in the same order for each research session. After mothers interviewed their children about the events, mothers were then interviewed by a researcher to see how much of the mother-child conversation the mothers remembered. Findings suggest that the initial recall of the conversation was only 5% of

the total conversation (quantity). Further analyses showed that the recall was 88% accurate (Bruck et al., 1999). When mothers were later asked to list all the activities their child participated in during the structured game event, the quantity recall increased to 66%. The authors suggest that the increase in quantity is caused by the more lenient scoring used for activities versus conversations. The conversations were scored using correct source attributions (which, as previously discussed, research has suggested people are poor at), whereas the activities from the structured game event were scored as correct if some aspect of the event was mentioned (e.g., mentioning the child used play dough but not mentioning how or what they used it for was still considered a correct detail). Similar to the Stafford & Daley (1984) study, quantity of overall recall was very low for the conversation. However, the Bruck and colleagues (1999) study also examined the accuracy rate of the initial recall which yielded a high level of accuracy. The results of the Bruck et al. (1999) study suggest that the mothers may have been reporting only what they were most confident in remembering correctly during the initial interview.

Quantity vs. Accuracy

Quantity and accuracy are both important for evaluating memory recall. Investigators will find it beneficial if witnesses recall a large quantity of correct details, but if they are also recalling many incorrect details it diminishes the reliability and trustworthiness of their recall. Therefore, the current study examined both quantity and accuracy of reports. Koriat and Goldsmith (1994) draw an important distinction between quantity-oriented approaches to memory and accuracy-oriented approaches and have created two memory metaphors to illustrate the differences.

The quantity-oriented approach to memory is referred to as the storehouse metaphor in which memory is an information-storage place where information is deposited and then subsequently retrieved. To assess quantity recall, researchers look at how much information was inputted and then examine how much of the input is recalled at output. For example, if 20 words were presented to the participant at encoding (input), and 5 were recalled at retrieval (output) then the quantity of recall was 25% (5/20). Measures that assess quantity usually ignore incorrect information and consider only correct information at output. Therefore, the quantity approach is concerned more with *how much* correct information is remembered and largely ignores the incorrect information that is reported.

The accuracy-oriented approach to memory refers to the correspondence metaphor. Instead of focusing on comparing how much of the input was correctly recalled at output, the accuracy-oriented approach emphasizes the relation between what the person recalls and what actually happened—therefore, focusing more on the reliability or trustworthiness of the reported information. Unlike the quantity-approach measure, an incorrect response negatively impacts accuracy of recall. Accuracy is the total number of correct responses at recall divided by the total number of correct plus incorrect responses at recall. If a witness recalled only four correct pieces of information, but also recalled six incorrect pieces of information then the overall accuracy of the recall is 40%. The accuracy-approach compares the output to what was presented at input, whereas the quantity-approach compares the input to how much of it is recalled at output—not considering incorrect information.

The focus on both the *accuracy* of the report and on *how much* is being reported are important, especially to the legal system, in which the decisions being made can be life-altering. We often want witnesses or informants to provide as many details as possible (quantity), but we want those details to be highly accurate. It is thus important to examine how different experimental manipulations influence both quantity and accuracy. Examining the influence of different experimental manipulations can suggest the best types of interviewing methods to obtain both high quantity and high accuracy of reports, which was an aim of the current study.

Koriat and Goldsmith (1994) conducted several experiments in which they evaluated the impact of various experimental manipulations on both quantity and accuracy of output. The two main manipulations were test format and report option (Koriat & Goldsmith,1994). Test format refers to the continuum of procedures used to test memory and can vary from production tests (recall/ free report) to selection tests (recognition/ multiple choice). Report option refers to a procedure to determine if respondents have the option not to answer and is found on a continuum from free to forced responses. When test format and report option combine, they form four main types of tests: free recall, forced recall, free recognition, and forced recognition. An example of each of these tests in a situation where participants are read 20 words that they need to later recall is as follows: (1) in a free recall test, participants are instructed to freely recall as many words as they can without any cues, (2) in a forced recall test, participant are instructed to recall 20 words (regardless of how confident they are and without any cues), (3) in a free recognition test, participants are instructed to respond to 20 cued questions, such as multiple choice questions, but they can choose not to answer if

they are unsure, and (4) in a forced recognition test, participants are instructed to answer 20 cued questions, such as multiple choice questions, that they are forced to answer (regardless of how confident they are).

In general, tests that involve free responses tend to yield more accurate reports but have lower output quantity compared to forced recall and forced recognition, because participants can choose what they want to report and what they do not want to report if they are unsure (Koriat & Goldsmith, 1994). In comparison, forced responses tend to have lower accuracy rates but have higher quantity rates. Forced-recognition tests, usually seen in legal psychology research in the form of closed-multiple-choice questions by an interrogator, yield higher quantity output because witnesses feel pressure to select an answer, but lower accuracy because they are reporting more than what they are confident about (i.e., potentially guessing). Thus, it is important for interviewers to balance the accuracy-quantity tradeoff. The current study mainly focuses on free recall responses by using open-ended interview questions where witnesses may search memory and report only those details, they felt confident were accurate. The free-recall test option should provide more accurate reports compared to forced recall questions. To increase quantity with free-recall questions, investigators will use additional techniques (e.g., the model statement as described in the CI section) that have been shown to increase witness output.

In human-intelligence-gathering contexts both quantity and accuracy of the details reported are important. Interviewers are gathering information that can pertain to national security which makes the task high-stakes. The more correct information the interviewer can help the witness to generate, the higher are the chances of helping the

analyst to make successful decisions based on the gained intelligence. An analyst is a key member of an interrogation team who pieces together bits of information, develops timelines, validates/refutes reported information based on existing intelligence and then helps to disseminate that information to the larger intelligence and law enforcement community (Russano et al., 2014). Together with the interviewer, the analyst will help sift through the information and predict what is most likely to occur. The more *accurate* information analysts have the more informed their decision can be about a future action. To help the analyst have the most accurate information, interviewers can modify their style of questioning as described above (free vs. forced; recall vs. recognition). By modifying their questioning style, interviewers can guide witnesses to report more accurate information (e.g., asking the witness more open-ended questions instead of forced recognition questions). Interviewers should thus ask questions that will allow for a high quantity of details while also maintaining a high level of accuracy. Gaining a high quantity of information is beneficial, but if many of those details are inaccurate national security could be at risk. In addition, using test procedures that only allow participants to report details of very high accuracy may lead to a low quantity of reported details which may also be harmful to national security.

The limited research on memory for conversations suggests that, overall, people are poor at recalling large quantities of details from the original conversation. Therefore, more research on memory for conversations is needed and, specifically, research regarding ways to improve quantity recall. In addition to reporting quantity recall, many studies have not reported accuracy rates. Accuracy of reported information is important to determine the reliability of the information. The proposed experiment thus aims to

increase the research on memory for conversations and in doing so also develop a method to enhance recall, and measure and maintain high accuracy.

Improving Memory

The Cognitive Interview. To examine ways to improve memory for conversations it is important first to explore techniques that have been shown to improve memory in general. The Cognitive Interview (CI) is a theory-based interview protocol that has been shown to enhance witness recall (Memon et al., 2010). The CI is used predominantly with eyewitness interviews regarding an event but can be used in a variety of contexts outside the legal system as it is a process-oriented approach to interviewing (Fisher & Geiselman, 2019). The techniques in the CI are thought of as a toolbox, not a recipe, meaning that they do not all need to be used every time or used in a particular order. Rather, some combination of techniques should be implemented as appropriate for a given situation.

The CI has been tested in more than 100 laboratory and field studies and through this testing there have been modifications and updates to the original procedure (Fisher & Geiselman, 2019). The CI functions by enhancing three main psychological processes: social dynamics, memory and general cognition, and communication. Each of the psychological processes has its own associated techniques. The social dynamics include (1) developing rapport between the interviewer and witness (see Vallano & Schreiber Compo, 2011 for a rapport overview) and (2) empowering the witness to generate additional information. An example of this is the interviewer instructing witnesses that they will be doing most of the talking and the interviewer is there just to listen. In normal conversation it is uncommon for one person to dominate the talking. Usually the

conversation flows back and forth between two people. Interviews seen on TV usually depict the rules of normal conversation as eager investigators ask witnesses question after question making it appear that the witness is there only to answer investigator's specific questions. However, in the CI setting it is important for witnesses to know that the rules of normal conversation do not apply because the interviewer did not see the event and therefore the witness will be doing most of the talking. It is important for investigators to not interrupt the witness during free recall. Interruptions during free recall indicate to the witness that the investigator is in control of the conversational exchange.

The cognitive and memory processes components include (1) the instruction to report everything (2) the instruction for witnesses not to guess (3) the instruction to reinstate mental context, (4) varied retrieval and (5) interviewers minimizing constructive recall by not asking suggestive or leading questions (Fisher et al., 2015). First, the report everything instruction is when interviewers instruct the witness to report as many details as possible, even if they seem irrelevant. The report everything instruction helps witnesses to feel comfortable sharing everything that they know. By sharing all remembered details there are more opportunities for witnesses to be cued to remember additional information. For example, a witness sharing that the perpetrator had a Florida (FL) license plate may then remember a bumper sticker was on the car. The witness otherwise may not have remembered the bumper sticker if he/she did not mention the license plate. Although the FL license plate may not be helpful to an investigation happening in FL, the bumper sticker may be more helpful to police trying to find the car. In addition to the report everything instruction, witnesses are also instructed not to guess

at information and that "don't know" responses are acceptable if witnesses are unsure about a specific detail.

Next, mental context reinstatement is an instruction where interviewers ask witnesses to think back to the time of the event in question and in their mind's eye recreate what they saw, smelled, felt, thought, etc. The context reinstatement component is predicated on the encoding specificity principle which states that the way in which a detail is retrieved is dependent on how the detail is originally encoded and stored (Tulving & Thomson, 1973). Reinstating the context of the to-be-remembered event facilitates retrieving the needed information. Context reinstatement is often accompanied by instructing witnesses to close their eyes, which has shown to help with concentration and retrieval (Perfect et al., 2008).

Another technique is varied retrieval, whereby witnesses are asked to recall the remembered information in diverse ways. An example is to recall all the information in chronological order, and then recall the information again in reverse chronological order. Another example is to have witnesses recall the information from both their own perspective and from the perspective of another person. The current study is focused on memory for conversations such that the varied retrieval questions could include recalling the conversation from the perspective of different speakers or various times when the conversational tone changed (e.g., thinking back to which speaker was more powerful, to when there was a change in the conversation, to when someone seemed surprised, when someone had more knowledge than another person etc. Finally, when asking follow-up questions and providing the witness with instructions, the interviewer should focus on

asking open-ended questions and avoid leading or suggestive questions in order not to bias the witness's responses.

To help the witness generate more information the interviewer also can use communication principles, by (1) providing a model statement that exemplifies the level of detail the witness should provide and (2) using code-compatible output. The model statement is usually only one minute long but provides the witness with an incredibly detailed example to demonstrate the degree of detail the interviewer expects. The model statement instruction will end with the interviewer telling witnesses that if they provide the same level of detail that the investigator did, in the model statement, the witnesses free recall will take them a long time (e.g., 20 minutes) to describe the event. The additional statement regarding the time it should take is provided so witnesses vary the level of detail to accommodate the expected amount of time. The specific time listed may vary depending on the complexity of the witnessed event and the amount of time for the interview. Going into the interview witnesses may not have expected to talk for long, but after this instruction witnesses should fill the requested time by providing more details. The expected-time instruction also helps to make clear that the witness will be doing most of the talking during the interview.

Lastly, the principle of code-compatible output entails witnesses responding in the same code or format as they stored the information, which helps witnesses to recall information that may be hard to verbalize. The "same code" refers to how witnesses encoded the information. An example is spatial layout. Witnesses may find it is easier to draw or sketch the spatial layout of a restaurant than to verbalize the layout because the layout was encoded spatially and not verbally. Another example is for witnesses to

perform some procedural action (e.g., showing procedurally how to tie shoes) rather than to verbalize the procedure. When the code at retrieval matches the code used at encoding it is easier for witnesses to express the information.

More than 100 laboratory and field studies examining the CI have shown that witnesses recall is enhanced by eliciting approximately 35%-50% more correct statements than a standard police interview (Fisher, Schreiber Compo, Rivard, & Hirn, 2014). A meta-analysis by Memon, Meissner, and Fraser (2010), concluded that the increase in quantity gained by the CI is a large and reliable effect (appearing in 58 out of the 59 experiments). Although the CI increases correct detail recall, it also increases incorrect detail recall (but at a much lower rate) but keeps the overall accuracy rates similar to a SI (Memon, Meissner, & Fraser, 2010). In general, the CI takes longer to complete than an SI, as CI witnesses are providing more information and are thus talking for a longer period of time (Fisher & Geiselman, 1992). However, the extra time it takes to conduct the CI is usually worth the extra quantity in details produced.

The CI has been shown to be beneficial even after a 1-month delay (Larsson, Granhag & Spjut, 2002) and to generate at least twice as many relevant responses after a 35-year delay (Fisher et al., 2000) compared to a SI. The effects have also been shown to be robust in ecologically valid field studies. Fisher, Geiselman and Amador (1989) conducted a field test in which police detectives were trained to use the CI to elicit information from witnesses to real crimes (robbery). The CI elicited 47% more information after the training (compared to before training interviews), and 63% more information than detectives in the unit who were not trained in the CI. Comparable

results have also been found in the UK and France (George & Clifford, 1996; Colomb, Ginet, Wright, Demarchi, & Sadler, 2013).

CI and memory for conversations. Currently only three studies have used the CI to help elicit recall of a conversation, and most of this previous research focused either on a few techniques from the CI or focused on event recall (speaker's description, scene related details etc.) with conversations being only a small part of the total recall. For example, Leins and colleagues (2014) conducted a study in which participants were asked to recall family events from the previous year, along with whom they spoke with and what was discussed. Participants were interviewed about the event with either a CI or SI. The family events were an analogue for terrorist meetings. In a two-part study the researchers tested a version of the CI in which the interviewer used the following five techniques: (1) encourage the witness to generate information, (2) mentally reinstate the event context, (3) encourage participants to close their eyes to aid recall, (4) encourage varied retrieval by having participants recall from various perspectives and, (5) encourage non-verbal output in the form of a sketch. Participants recalled twice as many family meetings in the CI than in the SI. Participants in the CI condition also reported twice as many overall details than in the control, including, most relevant for the current research, twice as many conversation details. Note, accuracy of reports was not measured in the Leins et al., study as it was not possible to verify the details provided. Although the main focus of the Leins et al. study was not specifically on memory for conversations, the CI nonetheless elicited more details regarding who participants spoke to and what was discussed.

Another study that focused specifically on recall for a conversation was conducted by Campos and Alonso-Quecuty (2008) in which participants watched a video of a mock dyadic criminal conversation. After listening to the conversation, participants completed a 15-minute filler activity and were then instructed to write down what they remember about the conversation. Then all participants were given an instructional booklet with questions to answer. Half the instructional booklets contained questions that exemplified a SI and the other half contained instructions that mimicked questions from a CI. There were no interviewers, and all questions were asked and answered through the booklet that participants filled out. The SI instructed the participants to answer one question: "what happened." The CI used only a select few elements and instructed participants to (1) reinstate mental context and report everything, (2) use reverse order reporting ("now tell the conversation from end to beginning"), (3) change perspective (recall the event from a new location), and (4) answer a series of pointed questions about names, features of speech, and unusual words or phrases. Participants who received the written CI recalled significantly more correct details compared to those in the written SI condition. Unlike earlier studies, accuracy was measured in Campos and Alonso-Quecuty (2008) study, and the CI had a significantly higher accuracy rate than the SI. The number of distortions and fabrications were not different between the two types of interviews.

An updated version of the CI was used in an experiment that looked at memory for group discussions on a provocative business dilemma (Castano & Fisher, 2007). Participants in groups of four to eight took part in a conversation regarding a business dilemma and were then interviewed two days later using either a SI or CI. The SI

consisted of open-ended questions followed by closed questions regarding the conversation. Each participant in the SI was asked the same questions in the same order. The CI included (1) the social dynamics of encouraging the witness to participate actively, (2) cognitive principles of reinstating the context, tailoring the questions to each witness's unique perceptions, and (3) communication principles that promoted extensive and detailed responses. Once again, the CI produced twice as many correct details as the SI. There was no difference in accuracy rates for the two types of interviews.

The findings from these three studies suggests that, similar to studies examining memory for events, the CI effect can be found for memory of conversations. Mixed results have been found regarding accuracy rate, with some studies showing the CI to have an increased accuracy rate compared to the SI (Campos & Alonso-Quecuty, 2008) and other studies showing similar accuracy rates between the two interviews (Castano & Fisher, 2007). The current study aimed to extend the previous literature using the most updated version of the CI and specifically examined *only* recall for conversations. Both quantity and accuracy of recall were examined.

Investigative Utility of the CI

With all the research on the CI, it is surprising that there are still gaps in the literature. One of the gaps is the investigative utility of the CI—does the CI improve investigators' job performance (e.g., more accurately identify perpetrators, stop future crimes, etc.)? Although the CI produces more correct details than a SI (Memon et al., 2010), it is unclear if the additional information leads to enhanced investigative utility. Although the description "*he was 5 feet- 11 inches to 6 feet- 2 inches tall and wore a light blue short-sleeve shirt with three buttons and tan cargo shorts*" has more details than "*he*

was about 6 feet tall and had a blue t-shirt and tan shorts on" it is possible that police will find no difference in helpfulness between the two descriptions when they are actually searching for the perpetrator that matches this description. Similarly, if the additional details are vague, repetitive, or irrelevant they may not be helpful to the task at hand which would not benefit the investigators. Therefore, when determining the value of the CI to investigators it is important not only to examine initial recall of information but also the ability to use the additional information that is produced to help investigators complete their jobs (e.g., find a suspect, prepare for an upcoming event). Without evidence that the additional details the CI produces are beneficial to job performance, investigators may not be convinced that the CI is a useful tool.

To date, there is only one study that has examined the investigative utility of the CI. In Satin and Fisher (2019) the investigative utility of the CI was examined for the goal of finding a perpetrator. In a two-part study, participants in Experiment 1 were part of a staged crime in which a confederate pretended to be a research assistant and stole a lockbox containing money. Participants were then asked to give a description of the perpetrator to an interviewer, as they were the only witnesses to the crime. The interviewer was another research assistant who then conducted either a CI or SI. Results from Experiment 1 found that the CI elicited more than three times as many perpetrator descriptors than the SI. Participants in Experiment 2, which included both students and police officers, received a transcript of the recalled details from Experiment 1. After receiving the details, participants picked the three people from a 10-person target-present line-up that they believed best matched the descriptors they received. The three selected people would be those that the participant believed the police needed to further

investigate. After picking the three potential suspects, participants could then allocate resources in the form of 100 investigative hours. Participants split the 100 hours of resources between the three suspects, with the instruction of assigning the most hours to the suspect believed most likely to be the thief.

Overall, the CI-produced descriptors were more useful to both student and police participants in selecting the perpetrator as one of their three choices compared to the SI-produced descriptors. For those in the CI conditions, 73% of participants selected the perpetrator compared to 56% in the SI conditions. Furthermore, participants in the CI conditions allocated significantly more resource hours to the perpetrator (M = 31.06, SD = 24.57) than participants in the SI conditions (M = 19.66, SD = 21.01). The almost-30% increase in correct suspect selection confirmed that the CI significantly improved performance of investigators in identifying the perpetrator, in addition to allocating significantly more resource hours to finding the perpetrator instead of an innocent suspect compared to the SI.

In addition to Satin and Fisher (2019), there is only one other study that has evaluated the utility of evidence-based interview protocol recommendations. Pipe and colleagues (2013) examined if the introduction of the evidence-based NICHD protocol was associated with changes in the outcomes of cases in which child sexual abuse was suspected. After comparing cases pre-NICHD to post-NICHD training the authors found that there were significant differences for two crucial decisions. First, charges were more likely to be filed by prosecutors following the introduction of the NICHD protocol (compared to before the NICHD protocol was introduced). Second, after charges were filed, post-NICHD protocol cases were associated with a significantly higher rate of

conviction. The increased rate of prosecutors filing charges supports the idea that the NICHD protocol is an effective tool for law enforcement. Pipe and colleagues (2013) suggest that the protocol most likely led to higher rates of charges being filed because the NICHD protocol involves fewer option-posing or inappropriate questions and more of the recall prompts and techniques that elicit high quality and more compelling information than non-NICHD protocol interviews. Both the CI and the NICHD are leading evidence-based interviewing procedures and as such, have much overlap in their procedures, with the NICHD geared more to interviewing children. Yet, with only two studies examining the utility of the procedures more research needs to be conducted in the area of investigative protocols.

Telephone Interviews

There is currently no research directly comparing in-person interviews to telephone interviews for information-gathering contexts. However, these interview modalities have been compared for personal information disclosures, usually related to qualitative survey research. As telephone interviews are cheaper to conduct and allow for a wider geographical sample many survey researchers have made the switch away from in-person interviews to the more convenient telephone interview (Block & Erskine, 2012). This same switch can be reflected in current investigations in which investigators may now be conducting more interviews over the telephone. Yet, there is still a concern that interviews conducted over the telephone may not result in as much *useful* information as interviews conducted face-to-face.

The past research comparing telephone to in-person interviews tended to use an unstructured interview format and typically focused on alcohol consumption, sexual

behavior or assault, and drug use (Greenfield, Midanik, & Rogers, 2000; Kraus & Augustin, 2001). Results from these studies are promising and suggest that there are very few differences between data collected over the telephone and data collected by more traditional in-person interviews (Block & Erskrine, 2012). As the data being collected in these studies was primarily personal in nature, telephone interviews have the added benefit of making the conversations more anonymous and thus respondents are more apt to answer honestly (i.e., not fall prey to social desirability responses) (Rosenbaum, 2006). The current study did not elicit personal information and as such anonymity is not a concern.

Some of the past research comparing interview modalities, however, utilized semi-structured interviews, which would more closely resemble the method of the current study. Sturges and Hanrahan (2004) used a semi-structured interview to ask correctional officers and visitors about their concerns about the visiting process at county jails. Half the participants were interviewed in-person and the other half were interviewed over the telephone. Results indicated that on average participants reported the same quantity of words regardless of interview format (Sturges & Hanrahan, 2004). The main difference between the past research comparing interview modalities and the current research is that the current study examined the accuracy of the reports given in addition to the quantity of information provided.

The previous survey research on telephone interviews seems to suggest that people perform no differently over the telephone than they do in-person for the quantity of information generated. However, the previous research did not explore information gathering that is not related to the self and did not take into account accuracy of reports.

With no prior research comparing telephone and in-person interviews for information gathering the current study will be the first to investigate if the CI effect will still be present if one conducts the interview over the telephone or if only SI interviews should be conducted over the telephone. In addition, the current study will also investigate whether the CI is just as efficient over the telephone as it is in-person.

It is possible that some information-gathering techniques may not function the same over the telephone as they would in-person. For example, previous research suggests that building trust over the telephone—a concept needed when building rapport—may be more difficult compared to when building trust in-person (Block & Erskine, 2019). There may also be techniques that are specific to the CI that work more efficiently in one modality than the other. For example, code-compatible output may work better in-person than over the telephone. It is easier for witnesses to describe inherently non-verbal experiences in-person than over the telephone, because in-person interviews allow for a wider array of non-verbal forms of output than do phone interviews (e.g., sketching the layout of a room, or acting out the movements of a procedural task). Other CI techniques, such as context reinstatement, may perform better over the telephone than in-person. Context reinstatement utilizes eye closure as a way to help witnesses concentrate. Asking people to close their eyes in-person may leave people feeling self-conscious or uncomfortable because they know the interviewer is "watching" them. However, over the telephone people might feel more comfortable closing their eyes, as no one is directly looking at them. Finally, other techniques, such as varied recall, should perform about the same in-person as they do over the telephone. As there

is no clear theoretical pattern of how the CI will be affected by Modality, the current study examined Modality as an exploratory measure.

The Current Study

The current study consisted of two experiments that extended the previous literature on the CI. Study 1 had two specific goals: (1) to test the CI in the context of memory for conversations and (2) to investigate the effects of modality by comparing interviews conducted in-person to interviews conducted over the telephone. Telephone interviews were used to better replicate real world situations in which informants or undercover agents want to keep their identity secret and/or not be seen talking with a member of law enforcement. In addition, telephone interviews may be used in many circumstances for logistic reasons in which it would be more convenient or cost-efficient to talk over the telephone instead of in-person. Currently, there is little research on memory for conversations, and even fewer studies using the current version of the CI to help elicit recall for conversations. Currently, there are no studies directly comparing in-person interviews to those conducted over the telephone for information gathering, despite law enforcements questions about whether more advanced interviewing techniques, such as the CI, can be conducted over the telephone with similar benefits as when conducted in-person (Fisher, personal correspondence).

Interviews from Study 1 were transcribed and used for Study 2. The goal of Study 2 was to examine the investigative utility of the CI as measured by the helpfulness of the information gathered, specifically, helpfulness to student "analysts" trying to help "police" stop an upcoming crime. Currently only one study has examined the

investigative utility of the CI (Satin & Fisher, 2019). With only one prior study on the investigative utility of the CI, more research on the topic is needed.

II. STUDY 1 METHOD

Participants in Study 1 played the role of an "undercover informant" and overheard a conversation regarding one of three potential crimes. The informants were then interviewed two days later with either a CI or a SI and the interview took place either in-person or over the telephone. It was predicted that the CI would produce more correct details than the SI. In congruence with past research on the CI, it was also predicted that the CI would have an equivalent accuracy rate to the SI. There were no predictions regarding the Modality of the interview (telephone vs. in-person) as this was an exploratory variable with limited prior research.

Participants

The current study recruited 92 undergraduate students from Florida International University. Twelve participants were removed because they failed to complete the procedure. One additional participant was removed for having a mean accuracy score three standard deviations below the study mean (M = .81, SD = .11). The final sample consisted of 79 participants of which 73% were female with a mean age of 22. Participants were primarily Hispanic (57.3%), followed by Black (18%), Caucasian (9%), Latinx (9%), Asian (3.4%) and other (1.1%). All participants received course credit for completing the study via SONA online systems.

Design

The current study was a 2 (Interview: Structured Interview vs. Cognitive Interview) X 2 (Modality: in-person vs. telephone) X 3 (Conversation: 1 vs. 2 vs. 3) between-subjects design. There were three different versions of the criminal conversation for

purposes of stimulus generalization. Conversations are described in more detail in the Materials section.

The main dependent variables were the number of total relevant details, the number of correct details and accuracy rates of the memory reports. Additional dependent measures included the total number of irrelevant units (described in the coding section), the five targeted details, length of the interviews and a questionnaire on participant motivation. Coding schemes are discussed below.

Materials

Conversations. All participants listened to one of three audio-recorded conversations regarding a future event (see Appendix A). Three different conversations were created to have stimulus generalization, so that the results would be less likely because of the specific stimulus used in the current study and instead a result of the experimental manipulations (e.g., stealing exam answers being more memorable for students than strategies to rob houses) (Wells & Windschitl, 1999). There were no predicted differences in memory recall among the three conversations. The future events included information that was representative of the knowledge human-intelligence investigators are trying to acquire when investigating an upcoming attack (dates, times, locations, and people involved). For example, there was a conversation between two people who discussed stealing tests at a specific time and location in the future. All conversations were played through a desktop computer with headphones. Conversations varied by main topic (stealing tests, planning a robbery, and drug trafficking) but all had the same basic components: At least 3 main speakers in the conversation with at least 6

people's names mentioned, approximately the same length *(M* = 8 minutes and 13 seconds), and the same number of mentioned times, days, and locations.

Structured interview. The control interview in the current study was a structured interview (SI) (see Appendix B). The SI first began with building rapport. Interviewers asked participants about their day, their current courses, and general niceties. Then interviewers explained to informants that they know the informant had overheard important information. The interviewer then asked the open-ended question: "Tell me everything you remember overhearing." After informants responded to the open-ended question, interviewers asked up to five semi-structured follow-up questions about the overheard conversation. The follow-up questions were used to elicit information pertaining to the five targeted details of the interview that the informant had not previously disclosed during the open-ended free recall. The five targeted details of the interview included learning about (1) the type of crime, (2) the days that were mentioned, (3) the times that were mentioned, (4) the locations that were mentioned, and (5) the names of the people that were mentioned. An example follow-up question is "You mentioned that John and Sam were going to exchange the exam answers. Can you tell me more about that; did you hear where that will occur?" Follow-up questions were constrained to these five topics to reduce the risk of practice effects on the interviewers and to prevent more specific closed-ended questions from being asked. The interviewer's final question was always "Is there anything else you remember?" The interview officially ended when either the informant responded with "that's all I can remember" (or something equivalent) or 30 seconds had passed, and the informant did not say anything additional.

Cognitive Interview. The CI (see Appendix C) also started off with building rapport, similar to in the SI, however, unlike the SI, during rapport building the interviewer also developed the appropriate social dynamics. The interviewer explained why participation was so important and valued and attempted to empower informants by telling them that they were the ones with all the information, not the interviewer. Since the informant had all the information and the interviewer did not, it was up to the informant to generate and share the information that could be used to help prevent a crime and help society. The interviewers then provided informants with a model statement to emphasize the amount of detail they were expecting to obtain. The model statement was approximately one minute in length and was unique for each participant, so the example statement did not sound rehearsed. Informants were told that they should try to provide a report matching the same level of detail as the interviewer's model statement, and if so, their report should take them about 20 minutes. Interviewers then helped informants to reinstate the context by instructing the informants to close their eyes and think back to when they first overheard the conversation. Once the informants had a mental image, the interviewer then asked the open-ended question "Please tell me everything you remember overhearing."

After the initial free recall, all interviewers followed-up on information the informants mentioned (or not) in their free recall that related to the five targeted details of the interview (the same goals as for the SI). The follow-up questions were selected on the basis of the varied retrieval component of the CI but slightly modified for conversations. For example, the retrieval components would reference auditory cues instead of visual cues (i.e., you mentioned that Sam was worried. I want you to think

back to when you overheard that part of the conversation and the sound of Sam's voice. What indicated to you that she was worried?). The interview officially ended when the interviewer asked, "Can you remember anything else?" and the informant responded with either "that's all I can remember" (or something equivalent) or 30 seconds had passed and the informant did not say anything additional.

Research assistants who played the role of interviewers were trained for several weeks on how to conduct both the CI and SI. Training included two group seminars (approximately 4 hours total) and multiple individual practice sessions (approximately 10-12 hours per person).

Motivation questionnaire. After informants were interviewed, they received a questionnaire that asked about their motivation to participate in the study (see Appendix D). The questionnaire examined how motivated informants were to listen to the conversation and to remember the conversation. Motivation questions were presented on a 1-7 Likert scale. The questionnaire also asked if informants had any prior knowledge about the study before they began and if they recognized any of the voices from the conversation they overheard. Lastly, basic demographic information was also gathered.

Procedure

Part 1. Participants were informed online when they signed up for the study that they would be playing the role of an undercover informant. The online description instructed participants to wait outside the main psychology office for someone to meet them and give them their "case mission." A research assistant then approached participants and confirmed that they were there to go undercover as an informant. The research assistant then explained that the informant's mission was to go "undercover" to

help police solve some open cases. All informants were told that wiretaps "bugs" had been planted on some potential suspects and that the informant's job was to listen in and report back on what they had learned. Research assistants provided informants with the main topic of the ongoing case (i.e., stealing exam answers, trafficking drugs, planning a robbery) so informants had some background on what they were about to overhear. Informants were also told that they would be interviewed by a "detective" who would audio record the interview, but that their identity would be kept a secret. All informants then chose a code name which they would be referred to by for the remainder of the study. All informants also provided a phone number (optional), in case the detective needed to contact them. Phone numbers were used in part 2 of the study, if an informant in the telephone condition forgot to call for their interview. If the informant agreed to participate, they would sign the informed consent and be brought to another room containing a computer. Informants were told to click on the file in the middle of the screen and to use the headphones to start listening in to the bug. Before entering the room, informants were instructed to turn their phones off—as it may "interfere" with the technical equipment—to pay close attention and not to take notes.

Informants were then randomly assigned to listen to one of three audio-recorded conversations. After the audio file had ended, informants were instructed to open the lab door and wait for further mission details. Research assistants then thanked the informants for their time and reminded them that they would be meeting with a detective in two days to be interviewed. Informants who were randomly assigned to the telephone interview condition were told that they would be calling the detective in two days and were instructed to take a picture of the phone number they will need to call. Participants

meeting in-person were reminded that the time and place of their interview was already emailed to them. Both groups were reminded to be on time as the detective was very busy and may not be able to see them if they were late.

Part 2. All informants were randomly assigned to receive either a SI or a CI and for the interview to be either over the telephone or in-person. All informants were sent a reminder email of their interview the day before. All interviews were audio recorded and transcribed for later use and coding.

Informants who were assigned to an in-person interview were instructed to arrive at a new lab location 48 hours after they overheard the conversation and to knock on the door four times. Research assistants playing the role of interviewers greeted informants by their designated code name and invited them into the room. Interviewers next conducted either a CI or SI. After the interview, the interviewers asked the informants to fill out a short questionnaire regarding how motivated they were to participate in the study and demographic questions. All informants were thanked for their time, debriefed, and asked not to mention the procedure to other potential participants.

Informants who were assigned to a telephone interview were instructed to call the previously provided phone number at their designated interview time. If the informant did not call within 10 minutes of their session starting, interviewers would call the informant and leave a message if no one answered. Interviewers then called back one more time before marking the participant as a "no-show" after 20 minutes. Once the interviewer was in contact with the informant, the interviewer proceeded similarly to the in-person conditions. After the interview, the interviewer emailed the motivation questionnaire link to the informant and waited on the telephone line while the informant

filled out the questionnaire, in case the informant had questions. All informants were then thanked for their time, the debriefing statement was read to them, and they were asked not to talk about the study procedure with other potential participants.

Coding

Every interview was audio recorded and the recordings were transcribed. Each transcript was first broken down into segments. For the purpose of the current study a new segment started each time the interviewer asked a new question (e.g., Tell me everything you remember (free recall) was one segment, followed by each cued recall question asked being its own segment). Each transcript was then further broken down into idea units. An idea unit referred to the smallest utterance that contained a subject and predicate that could be checked for accuracy against the original conversation (Campos & Alonso-Quecuty, 2006). Therefore, the sentence "Richard stole the laptop and cellphone" can be broken down into two idea units: (1) Richard stole the laptop and (2) [Richard stole the] cellphone. Each idea unit was then scored as one of the following: (1) correct response if the recalled detail matched the gist of the original conversation: the informant saying "Mr. Rodriguez is the boss" and the conversation confirmed that Mr. Rodriguez was the boss (2) incorrect response if the recalled detail did not match the gist of the original conversation: the informant saying "John is the boss" and the conversation stated Mr. Rodriguez is the boss (3) "don't know" responses, any time informants said they did not know or did not remember (4) informant inquiry responses, any time the informant asked a question to the interviewer, such as "Should I keep going?" or "Can you repeat the question" (5) not scorable responses, an unverifiable or not meaningful response, such as incomplete sentences, "so it's so, um and then what else…yeah that's

all I know" (6) subjective information responses, opinion units that cannot be verified, e.g., "he sounded nice" and (7) repeated information, any unit that provided the same information within the same segment, "I believe it was two guys. Yes, two guys."

Coding schemes used the original conversation transcript as a guide. However, scoring of transcripts was completed using gist memory recall, and therefore units were marked as correct even if they did not exactly match with the original conversations. An example sentence given by an informant is "Jon is a law student." The sentence was considered correct even though the conversation only mentioned that Jon is planning to take the BAR exam once he finishes the current school semester. For the purpose of the analyses correct and incorrect units were added together to create the variable "relevant units." Accuracy rate was calculated by dividing the total number of correct units by the total number of correct units plus incorrect units. The term "irrelevant units" refers to a combination of "don't know," informant inquiry, not scorable, subjective, and repeated units.

Transcripts were also separately coded for the presence (or absence) of the "five targeted details" that were sought by the interviewers, (1) the type of crime, (2) the day of the week of the crime, (3) the time of the crime, (4) the location of the crime and (5) the names of those involved in the crime. Each name of a person was counted as its own unit. Conversation 1 and 2 each had two people committing the crime and conversation 3 had three people committing the crime.

A primary coder scored all 79 transcripts and a secondary coder scored a randomly selected subset (40% overlap). To assess interrater reliability, intraclass correlation coefficients (ICC) between the primary and secondary coder for the

aforementioned unit categories along with relevant units and accuracy rates were computed. Moderate to excellent interrater reliability was found ranging from .72-.98.

III. STUDY 1 RESULTS

Preliminary Analyses

Preliminary analyses were conducted to check for differences between the three conversations that participants overheard for Study 1. A 2 X 2 X 3 factorial ANOVA was conducted with Interview, Modality and Conversation as the independent variables, and total relevant units, accuracy rate, and the totals of each of the seven-unit types as the dependent variables. There were no significant interactions between Conversation and Interview or between Conversation and Modality and there was no significant three-way interaction, all $Fs \leq .88$, all $ps > .05$. Therefore, Conversation was collapsed across Interview and Modality.

Results are first presented for the total number of relevant units, number of correct units, accuracy rate and the remaining five individual units. Results are then further broken down into those units mentioned in the free recall and then follow-up questions portion of the interview. Next the relevant units, total correct units, and accuracy rate for the final five targeted details are reported. The last set of analyses explore interview duration results and the motivational questionnaire results.

Total Relevant Units, Correct Units, Accuracy Rate, and Individual Units

A series of 2X2 factorial ANOVAs were conducted to examine the effects of Interview and Modality on total relevant units, number of correct units, accuracy rate, and each of the remaining five individual unit types that were coded.

Relevant units. For total relevant units there was a significant main effect of Interview, $F(1, 75) = 28.02$, $p < .001$, $\eta_p^2 = .27$, observed power = 1.00, such that those in the CI ($M = 62.14$) produced 61% more relevant units of information than those in the SI

(M = 38.67) (see Table 1). There was no significant main effect of Modality, $F(1, 75)$ = .92, p = .34, η_p^2 = .01, observed power = .16, or interaction between Interview and Modality, $F(1, 75)$ = 1.48, p = .23, η_p^2 = .02, observed power = .22.

Although the interaction between Interview and Modality was not significant simple main effects were conducted to more directly compare the CI/in-person condition to the CI/telephone condition. Simple main effects analysis revealed that there were no significant differences in the number of relevant units recalled in the CI/in-person condition and CI/telephone condition, $F(1, 75)$ = 2.21, p = .66. There were also no significant differences between the SI/in-person and SI/telephone conditions, $F(1, 75)$ = .04, p = .85. However, there were significantly more recalled relevant units in the CI/telephone condition (M = 57.42) than the SI/telephone condition (M = 39.24), $F(1, 75)$ = 8.44, p = .01.

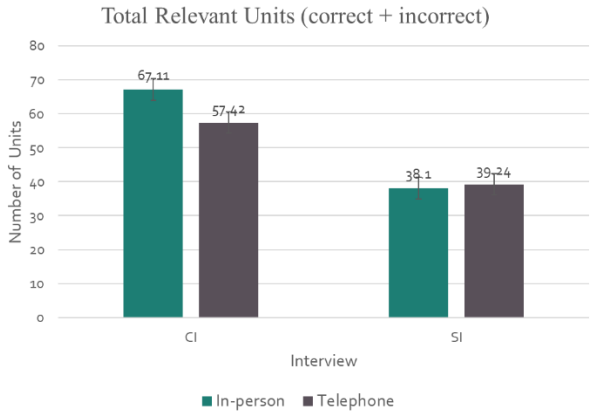

Figure 1. Means of total relevant units as a function of Interview and Modality

Correct units. For total correct units there was a significant main effect of Interview, $F(1, 75)$ = 21.12, p < .001, η_p^2 = .22, observed power 1.00, such that those in the CI (M = 49.84) produced 55% more correct units of information than those in the SI

(M = 32.07) (see Table 2). There was no significant main effect of Modality, $F(1, 75)$ = 1.41, p = .24, η_p^2 = .02, observed power = .22 or interaction between Interview and Modality, $F(1, 75)$ = 1.01, p = .32, η_p^2 = .01, observed power = .17.

Although the interaction between Interview and Modality was not significant simple main effects were conducted to more directly compare the CI/in-person condition to the CI/telephone condition. Simple main effects analysis revealed that there were no significant differences in the number of correct units recalled in the CI/in-person condition and CI/telephone condition, $F(1, 75)$ = 2.26, p = .14. There were also no significant differences between the SI/in-person and SI/telephone conditions, $F(1, 75)$ = .02, p = .89. However, there were significantly more recalled correct units in the CI/telephone condition (M = 45.68) than the SI/telephone condition (M = 31.71), $F(1, 75)$ = 6.54, p = .01.

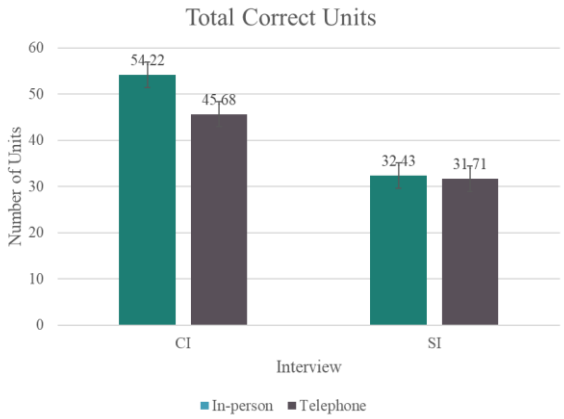

Figure 2. Means of total correct units as a function of Interview and Modality

Accuracy rate. For overall accuracy rate there were no main effects of Interview, $F(1, 75)$ = 1.48, p = .23, η_p^2 = .02, observed power .23 or Modality, $F(1, 75)$ = 2.56, p = .11, η_p^2 = .03, observed power .35. There was also no significant interaction

between Interview and Modality, $F(1, 75) = .90$, $p = .35$, $\eta_p^2 = .01$, observed power .23 (see Table 3).

Although the interaction between Interview and Modality was not significant simple main effects were conducted to more directly compare the CI/in-person condition to the CI/telephone condition. Simple main effects analysis revealed that there were no significant differences in the accuracy rate between the CI/in-person condition and CI/telephone condition, $F(1, 75) = .20$, $p = .66$. There were also no significant differences between the SI/in-person and SI/telephone conditions, $F(1, 75) = 3.46$, $p = .07$. There were also no significant differences between the CI/telephone condition ($M = .79$) and the SI/telephone condition ($M = .80$), $F(1, 75) = .04$, $p = .85$.

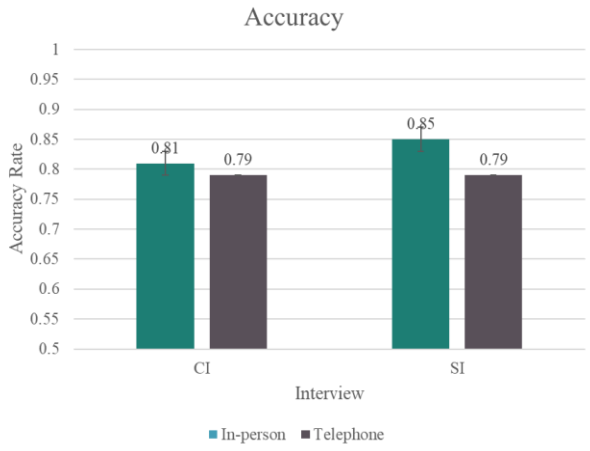

Figure 3. Accuracy rate as a function of Interview and Modality

Don't know units. For total "don't know" units there were no main effects of Interview, $F(1, 75) = .09$, $p = .77$, $\eta_p^2 = .00$ observed power = .06, or Modality, $F(1, 75) = .75$, $p = .39$, $\eta_p^2 = .01$, observed power = .14. There was also no significant interaction between Interview and Modality, $F(1, 75) = 1.06$, $p = .31$, $\eta_p^2 = .01$, observed power = .17.

Informant inquiry units. For total informant inquiry units there were no main effects of Interview, $F(1, 75) = 3.28$, $p = .07$, $\eta_p^2 = .04$ observed power = .43, or Modality, $F(1, 75) = 3.06$, $p = .09$, $\eta_p^2 = .04$, observed power = .41. There was also no significant interaction between Interview and Modality, $F(1, 75) = .45$, $p = .50$, $\eta_p^2 = .01$, observed power = .10.

Not scorable units. For total not scorable units there was a significant main effect of Interview, $F(1, 75) = 6.68$, $p = .01$, $\eta_p^2 = .08$, observed power .72, such that those in the CI conditions ($M = 8.97$) reported significantly more not-scorable units of information than those in the SI ($M = 6.74$) (see Table 4). There was no significant main effect of Modality, $F(1, 75) = .09$, $p = .76$, $\eta_p^2 = .001$ observed power = .06, or interaction between Interview and Modality, $F(1, 75) = .55$, $p = .46$, $\eta_p^2 = .01$ observed power = .11.

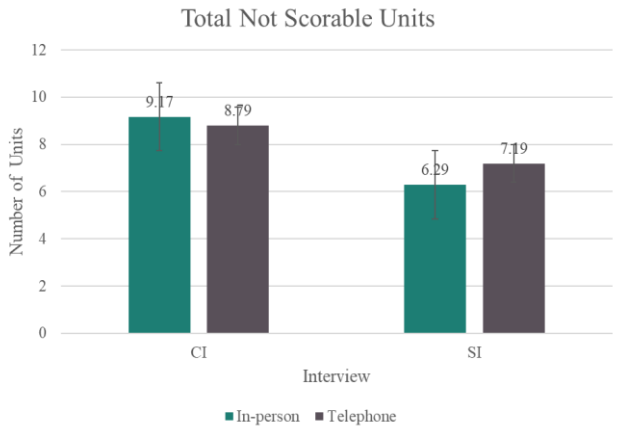

Figure 4. Means of total not scorable units as a function of Interview and Modality

Subjective units. For total subjective units there was a significant main effect of Interview, $F(1, 75) = 15.39$, $p < .001$, $\eta_p^2 = .17$, observed power .97, such that those in the CI conditions ($M = 3.73$) recalled significantly more subjective units of information than those in the SI ($M = 1.10$) (see Table 5). There was also a significant main effect of

Modality, $F(1, 75) = 8.02$, $p = .01$, $\eta_p^2 = .10$, observed power .80, such that those receiving in-person interviews ($M = 3.23$) recalled significantly more subjective units of information than those receiving telephone interviews ($M = 1.45$). The main effects were qualified by a significant interaction between Interview and Modality on total subjective units, $F(1, 75) = 8.02$, $p = .01$, $\eta_p^2 = .10$, observed power .80. Simple main effects analysis revealed that for those in the CI conditions, significantly more total subjective units were recalled with in-person interviews compared to the telephone interviews, $F(1,75) = 15.09$, $p < .001$. For those in the SI conditions, interview modality did not have a significant effect on total subjective utterances, $F(1,75) = .00$, $p = 1.00$.

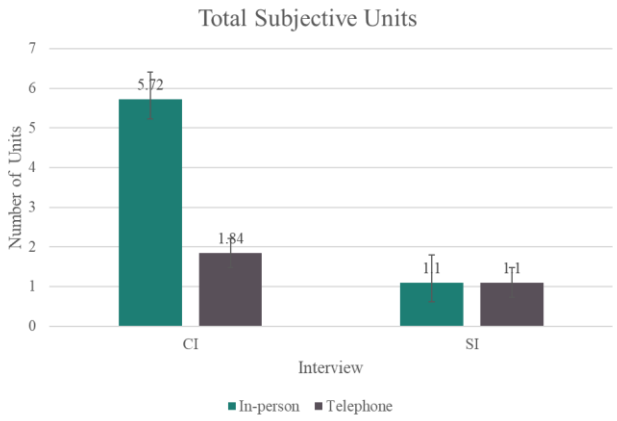

Figure 5. Means of total subjective units as a function of Interview and Modality

Repeated units. For total repeated units there was a significant main effect of Interview, $F(1, 75) = 11.34$, $p < .001$, $\eta_p^2 = .13$, observed power .91, such that those in the CI conditions ($M = 4.81$) provided significantly more repeated units of information than those in the SI ($M = 2.60$) (see Table 6). There was no significant main effect of Modality, $F(1, 75) = .48$, $p = .49$, $\eta_p^2 = .01$, observed power .11. However, the main effects were qualified by a significant interaction between Interview and Modality on

repeated units, $F(1, 75) = 5.15$, $p < .001$, $\eta_p^2 = .17$, observed power .97. Simple main effects analysis revealed that for those in the CI, significantly more total repeated units were recalled in the in-person interviews compared to the telephone interviews, $F(1,75) = 9.89$, $p < .01$. However, for those in the SI, just the opposite pattern was observed: significantly more total repeated units were recalled in the telephone interviews compared to the in-person interviews, $F(1,75) = 5.46$, $p = .02$.

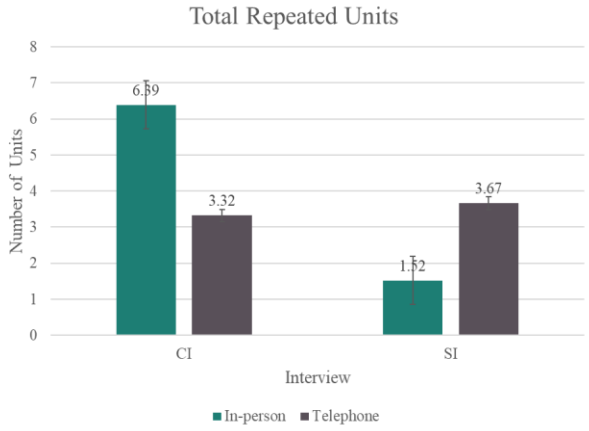

Figure 6. Means of total repeated units as a function of Interview and Modality

Free Recall: Relevant Units, Correct Units, Accuracy Rate and Individual Units

Relevant units. For relevant units during free recall there was a significant main effect of Interview, $F(1, 75) = 32.63$, $p < .001$, $\eta_p^2 = .30$, observed power 1.00, such that those in the CI conditions (M = 38.08) produced 89% more relevant units during free recall than those in the SI (M = 20.12) (see Table 1). There was no significant main effect of Modality, $F(1, 75) = .11$, $p = .74$, $\eta_p^2 = .00$ observed power = .06, or interaction between Interview and Modality, $F(1, 75) = .00$, $p = .99$, $\eta_p^2 = .00$ observed power = .05.

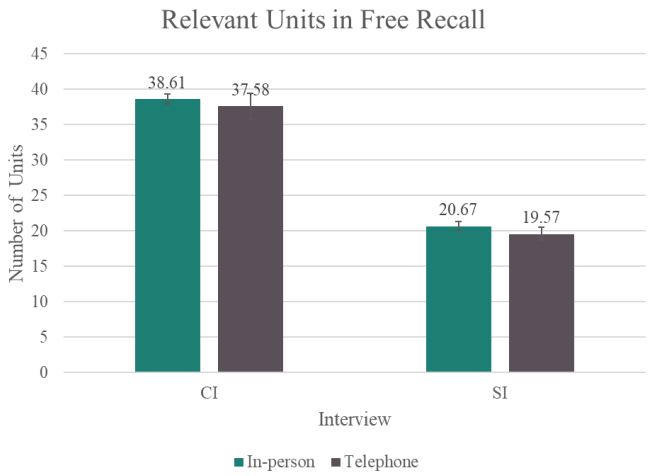

Figure 7. Means of relevant units in free recall as a function of Interview and Modality

Correct units. For correct units during free recall there was a significant main effect of Interview, $F(1, 75) = 25.53$, $p < .001$, $\eta_p^2 = .25$ observed power = 1.00, such that those in the CI conditions ($M = 31.27$) produced 81% more correct units of information during free recall than those in the SI ($M = 17.24$) (see Table 2). There was no main effect of Modality, $F(1, 75) = .44$, $p = .51$, $\eta_p^2 = .01$ observed power = .10, or interaction between Interview and Modality, $F(1, 75) = .01$, $p = .94$, $\eta_p^2 = .00$ observed power = .05.

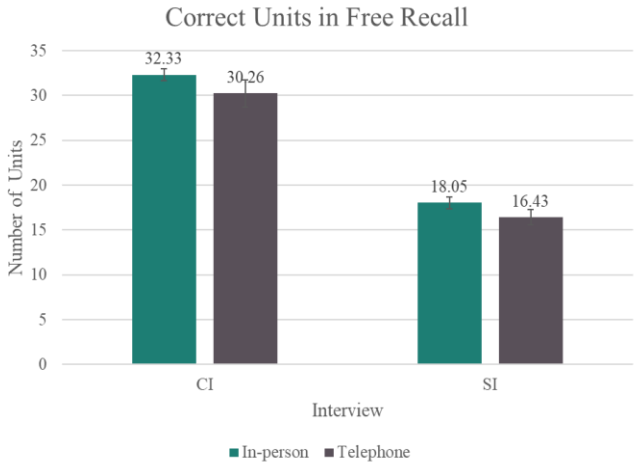

Figure 8. Means of correct units in free recall as a function of Interview and Modality

Accuracy rate. For accuracy rate during free recall there were no significant main effects of Interview, $F(1, 75) = 2.77$, $p = .10$, $\eta_p^2 = .04$ observed power = .38, or Modality, $F(1, 75) = 1.24$, $p = .27$, $\eta_p^2 = .02$ observed power = .20 (see Table 3). There was also no significant interaction between Interview and Modality, $F(1, 75) = .06$, $p = .81$, $\eta_p^2 = .00$ observed power = .06.

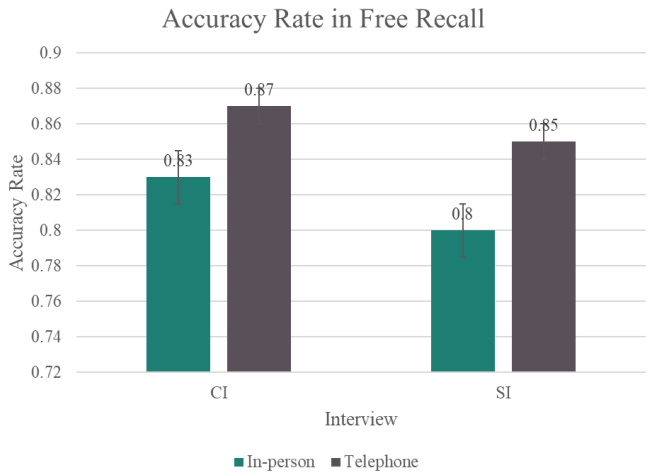

Figure 9. Accuracy rate of free recall as a function of Interview and Modality

Don't know units. For "don't know" units during free recall there were no significant main effects of Interview, $F(1, 75) = .08$, $p = .78$, $\eta_p^2 = .00$ observed power = .06, or Modality, $F(1, 75) = .64$, $p = .43$, $\eta_p^2 = .01$ observed power = .12. There was also no significant interaction between Interview and Modality, $F(1, 75) = 1.64$, $p = .20$, $\eta_p^2 = .02$ observed power = .24.

Informant inquiry units. For informant inquiry units during free recall there were no significant main effects of Interview, $F(1, 75) = 2.64$, $p = .11$, $\eta_p^2 = .03$ observed power = .36, or Modality, $F(1, 75) = 1.55$, $p = .22$, $\eta_p^2 = .02$ observed power = .23. There was also no significant interaction between Interview and Modality, $F(1, 75) = .57$, $p = .45$, $\eta_p^2 = .01$ observed power = .12.

Not scorable units. For not scorable units during free recall there was a significant main effect of Interview, $F(1, 75) = 10.60$, $p < .01$, $\eta_p^2 = .12$, observed power .90, such that those in the CI conditions ($M = 3.68$) provided significantly more not-scorable units than those in the SI ($M = 2.07$) (see Table 4). There was no significant main effect of Modality, $F(1, 75) = .09$, $p = .76$, $\eta_p^2 = .00$ observed power = .06, or interaction between Interview and Modality, $F(1, 75) = .95$, $p = .33$, $\eta_p^2 = .01$ observed power = .16.

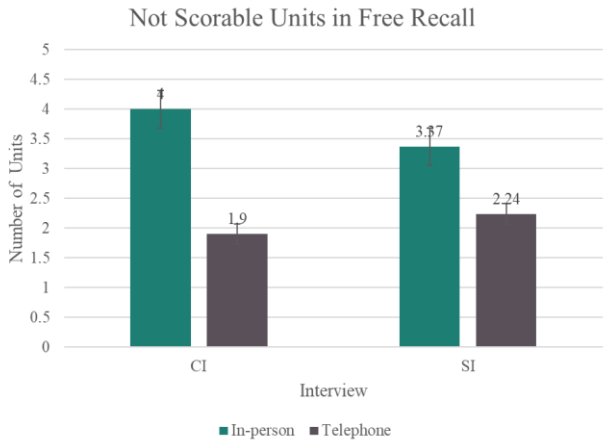

Figure 10. Means of not scorable units in free recall as a function of Interview and Modality

Subjective units. For subjective units during free recall there was a significant main effect of Interview, $F(1,75) = 8.37$, $p = .01$, $\eta_{p2} = .10$, observed power .82, such that those in the CI conditions ($M = 1.51$) recalled significantly more subjective units than those in the SI ($M = .36$) (see Table 5). There was no significant main effect of Modality, $F(1, 75) = 1.59$, $p = .21$, $\eta_{p2} = .02$ observed power = .24, or interaction between Interview and Modality, $F(1, 75) = 2.60$, $p = .10$, $\eta_{p2} = .03$ observed power = .36.

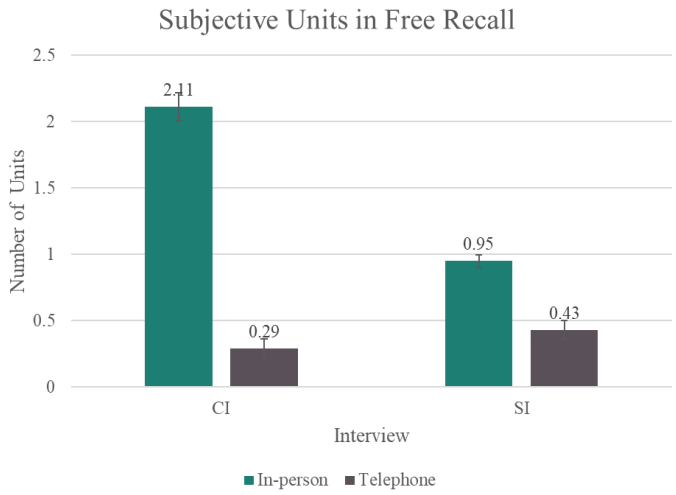

Figure 11. Means of subjective units in free recall as a function of Interview and Modality

Repeated units. For repeated units during free recall there was a significant main effect of Interview, $F(1, 75) = 16.06$, $p < .001$, $\eta_{p2} = .18$, observed power .98, such that those in the CI conditions ($M = 2.32$) reported significantly more repeated units than those in the SI ($M = .81$) (see Table 6). There was no significant main effect of Modality, $F(1, 75) = .55$, $p = .46$, $\eta_{p2} = .01$ observed power = .11. However, the main effects were qualified by a significant interaction between Interview and Modality, $F(1, 75) = 8.88$, $p < .01$, $\eta_{p2} = .11$, observed power .84. Simple main effects analysis revealed that for those in the CI, significantly more repeated units were recalled during free recall in in-person interviews compared to the telephone interviews, $F(1,75) = 6.50$, $p = .01$. For those in the SI, interview modality did not have a significant effect on subjective utterances during free recall, $F(1,75) = 2.68$, $p = .11$.

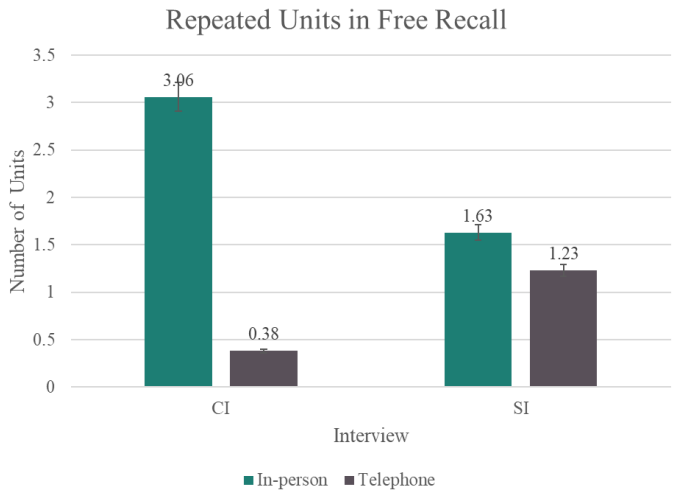

Figure 12. Means of repeated units in free recall as a function of Interview and Modality

Follow-Up Questions: Relevant Units, Accuracy Rate and Individual Units

Relevant units. For relevant units during the follow-up questions there was a significant main effect of Interview, $F(1, 75) = 5.00$, $p = .03$, $\eta_p^2 = .06$, observed power .60, such that those in the CI conditions ($M = 24.05$) produced 30% more relevant units of information than those in the SI ($M = 18.55$) (see Table 1). There was no significant main effect of Modality, $F(1, 75) = 1.63$, $p = .21$, $\eta_p^2 = .02$ observed power = .24. However, the main effects were qualified by a significant interaction between Interview and Modality, $F(1, 75) = 4.70$, $p = .03$, $\eta_p^2 = .06$ observed power = .57. Simple main effects analysis revealed that for those in the CI, significantly more relevant units were recalled in the in-person interviews compared to the telephone interviews, $F(1,75) = 5.57$, $p = .02$. For those in the SI, interview modality did not have a significant effect on relevant utterances, $F(1,75) = .42$, $p = .52$.

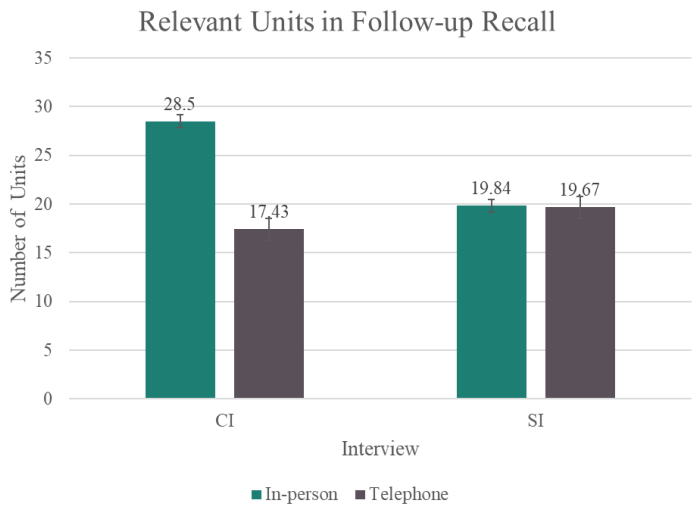

Figure 13. Means of relevant units in follow-up recall as a function of Interview and Modality

Correct units. For correct units during the follow-up questions there was no main effect of Interview on correct units, $F(1, 75) = 3.50$, $p = .07$, $\eta_p^2 = .05$ observed power = .46, however, the results were trending in the predicted direction ($M_{CI} = 18.57$; $M_{SI} = 14.83$) (see Table 2). There was also no main effect of Modality, $F(1, 75) = 1.85$, $p = .18$, $\eta_p^2 = .02$ observed power = .27, or interaction between Interview and Modality, $F(1, 75) = 3.26$, $p = .08$, $\eta_p^2 = .04$ observed power = .43.

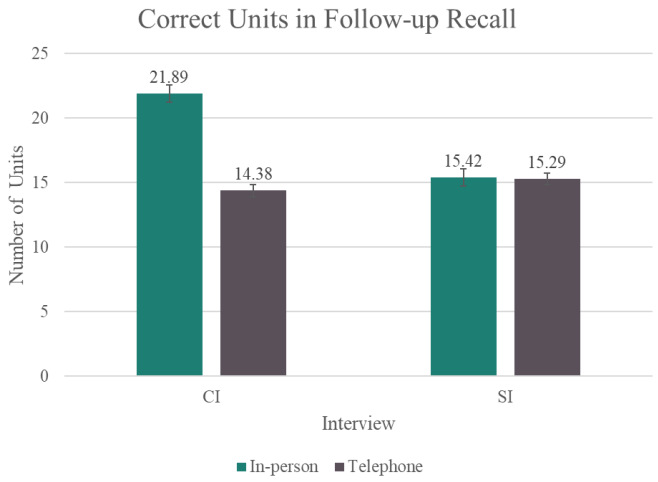

Figure 14. Means of correct units in follow-up recall as a function of Interview and Modality

Accuracy rate. For accuracy rate during the follow-up questions there were no significant main effects of Interview, $F(1, 75) = .06$, $p = .81$, $\eta_p^2 = .00$ observed power = .06, or Modality, $F(1, 75) = .74$, $p = .39$, $\eta_p^2 = .01$ observed power = .14 (see Table 3). There was also no significant interaction between Interview and Modality, $F(1, 75) = 1.48$, $p = .23$, $\eta_p^2 = .02$ observed power = .22.

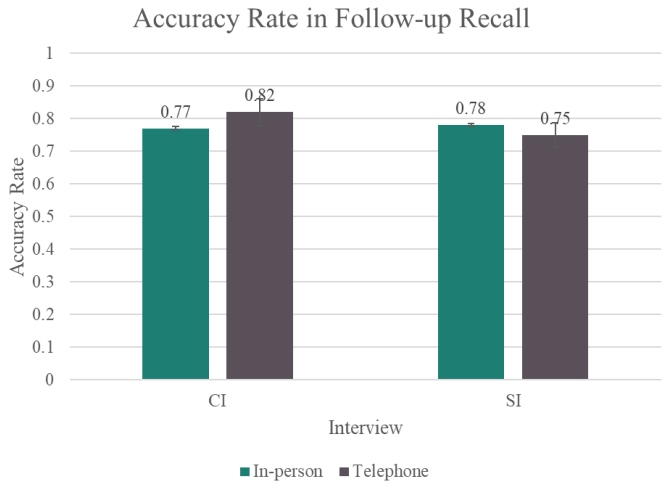

Figure 15. Accuracy rate in follow-up recall as a function of Interview and Modality

Don't know units. For "don't know" units during the follow-up questions there were no significant main effects of Interview, $F(1, 75) = .05$, $p = .83$, $\eta_p^2 = .00$, observed power = .06, or Modality, $F(1, 75) = 40$, $p = .53$, $\eta_p^2 = .01$ observed power = .10. There was also no significant interaction between Interview and Modality, $F(1, 75) = .29$, $p = .59$, $\eta_p^2 = .00$ observed power = .08.

Informant inquiry units. For informant inquiry units during the follow-up questions there were no significant main effects of Interview, $F(1, 75) = 1.72$, $p = .19$, $\eta_p^2 = .02$ observed power = .25, or Modality, $F(1, 75) = 2.68$, $p = .11$, $\eta_p^2 = .04$ observed power = .37. There was also no significant interaction between Interview and Modality, $F(1, 75) = .10$, $p = .75$, $\eta_p^2 = .00$ observed power = .06.

Not scorable units. For not-scorable units during the follow-up questions there were no significant main effects of Interview, $F(1, 75) = 2.13$, $p = .15$, $\eta_p^2 = .03$, observed power .30, or Modality, $F(1, 75) = .05$, $p = .83$, $\eta_p^2 = .00$, observed power = .06 (see Table 4). There was also no significant interaction between Interview and Modality, $F(1, 75) = .50$, $p = .48$, $\eta_p^2 = .01$ observed power = .11.

Subjective units. For subjective units during the follow-up questions there was a significant main effect of Interview, $F(1, 75) = 11.83$, $p < .001$, $\eta_p^2 = .14$, observed power .92, such that those in the CI conditions ($M = 2.21$) recalled significantly more subjective units of information during the follow-up questions than those in the SI ($M = .74$) (see Table 5). There was also a significant main effect of Modality, $F(1, 75) = 10.54$, $p < .01$, $\eta_p^2 = .12$, observed power .89, such that those who received in-person interviews ($M = 2.10$) recalled significantly more subjective units of information during the follow-up questions than those who received telephone interviews ($M = .78$). The main effects were

qualified by a significant interaction between Interview and Modality, $F(1,75) = 8.54$, $p = .01$, $\eta_p^2 = .10$, observed power .82. Simple main effects analysis revealed that for those in the CI conditions, significantly more subjective units were recalled during the follow-up questions in the in-person interviews compared to the telephone interviews, $F(1,75) = 17.89$, $p < .001$. For those in the SI, interview modality did not have a significant effect, $F(1,75) = .06$, $p = .81$.

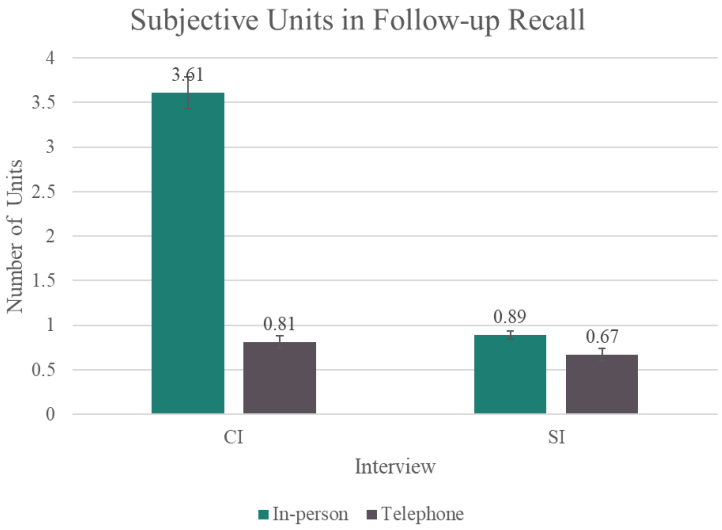

Figure 16. Means of subjective units in follow-up recall as a function of Interview and Modality

Repeated units. For repeated units during the follow-up questions there were no significant main effects of Interview, $F(1, 75) = 2.24$, $p = .14$, $\eta_p^2 = .03$, observed power = .32, or Modality, $F(1, 75) = .14$, $p = .71$, $\eta_p^2 = .00$ observed power = .07 (see Table 6). However, the main effects were qualified by a significant interaction between Interview and Modality, $F(1, 75) = 9.24$, $p < .01$, $\eta_p^2 = .11$, observed power = .85. Simple main effects analysis revealed that for those in the CI, significantly more repeated units were recalled in the in-person interviews compared to the telephone interviews, $F(1,75) = 5.48$,

p = .02. For those in the SI, marginally more repeated units were recalled in the telephone interviews compared to the in-person interviews, $F(1,75) = 3.79$, p = .06.

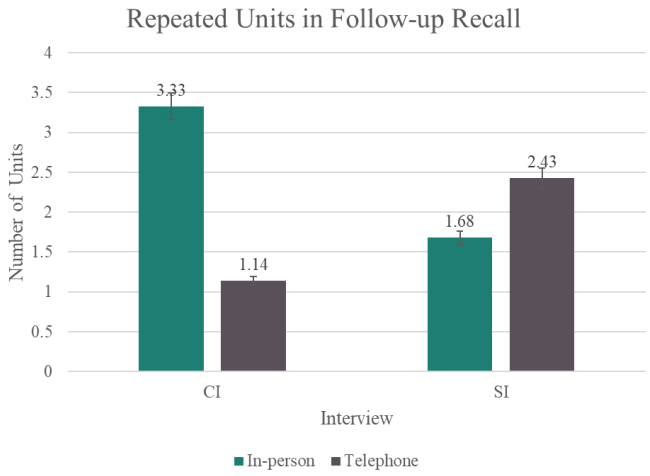

Figure 17. Means of subjective units in follow-up recall as a function of Interview and Modality

Five Targeted Details

Similar to the above, the five targeted details were analyzed for total relevant units (correct + incorrect), total correct units, and accuracy rate (correct / (correct + incorrect)). However, the five targeted details analyses were only tallied as a single total score (i.e., if the units were present or missing from the interview) and not separated into free versus follow-up questions.

Total relevant units. For total relevant units of the five targeted details there were no significant main effects of Interview, $F(1, 75) = .08$, p = .79, η_p^2 = .00, observed power = .06, or Modality, $F(1, 75) = .34$, p = .56, η_p^2 = .00, observed power = .09. There was also no significant interaction between Interview and Modality, $F(1, 75) = .22$, p = .64, η_p^2 = .00, observed power = .07.

Correct units. For total correct units of the five targeted details there were no significant main effects of Interview, $F(1, 75) = .17$, $p = .69$, $\eta_p^2 = .00$, observed power = .07, or Modality, $F(1, 75) = .71$, $p = .40$, $\eta_p^2 = .01$, observed power = .13. There was also no significant interaction between Interview and Modality, $F(1, 75) = 71$, $p = .40$, $\eta_p^2 = .01$, observed power = .13.

Accuracy rate. For the overall accuracy rate of the five targeted details there were no significant main effects of Interview, $F(1, 75) = .20$, $p = .66$, $\eta_p^2 = .00$, observed power = .07, or Modality, $F(1, 75) = 1.37$, $p = .25$, $\eta_p^2 = .02$, observed power = .21. There was also no significant interaction between Interview and Modality, $F(1, 75) = 1.73$, $p = .19$, $\eta_p^2 = .02$, observed power = .26.

Interview Duration

To examine whether Interview and Modality influenced the duration of the interviews, a 2 X 2 factorial ANOVA was conducted on the effects of Interview and Modality on interview duration. Both interviews started when the interviewer first asks the open-ended question "tell me everything you remember overhearing" and ended when the informant stated that there was nothing more they could remember. A significant main effect of Interview emerged $F(1, 75) = 141.72$, $p < .001$, $\eta_p^2 = .65$, observed power = 1.00, such that CI interviews ($M = 13.33$) took more than twice as long as SI interviews ($M = 5.84$). There was no main effect of Modality, $F(1, 75) = .09$, $p = .76$, $\eta_p^2 = .00$, observed power = .06 or interaction between Interview and Modality, $F(1, 75) = .26$, $p = .61$, $\eta_p^2 = .00$, observed power = .08.

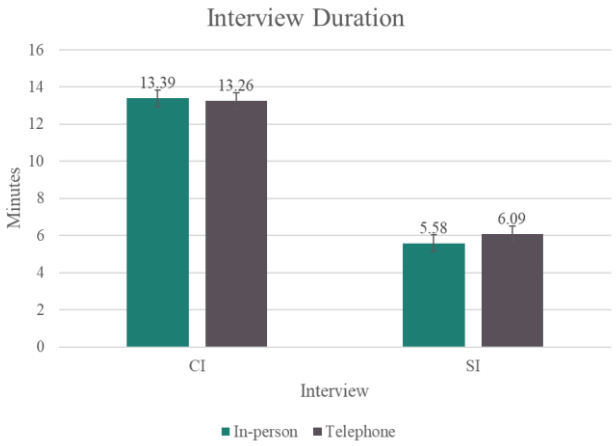

Figure 18. Means of interview duration as a function of Interview and Modality

Motivational Questionnaire

Due to procedural errors the results of the motivational questionnaire cannot be analyzed as a function of Interview and Modality but can still provide general overarching results. All questions were asked on a 1-7 Likert scale with higher numbers indicated more positive responses.

When asked how motivated participants were to listen to the conversation the mean response was 5.38. When asked how motivated participants were to remember the conversation the mean response was 5.06. When asked how realistic the interview was the mean response was 5.48. Finally, when asked how competent the interviewer was the mean response was 6.48.

IV. STUDY 1 DISCUSSION

The three primary aims of Study 1 were: (1) to test the CI (compared to the SI) in the context of memory for conversations, (2) to compare the in-person interviews to telephone interviews, and (3) to directly compare the in-person CI condition to the telephone CI condition. The current study is one of the only studies to use the current CI techniques to specifically examine memory for conversations. In addition, the current study is the first to directly compare the amount of information gathered in telephone versus in-person interviews.

Main Findings

Memory for conversations. In agreement with the past literature, a robust CI effect was found in the present study, with the CI eliciting 63% more total relevant units than the SI. The strong CI effect held in both free recall (89% increase) and in the follow-up questions (30% increase). Two main issues are addressed: the overall strength of the CI, and why the CI effect is larger for free recall than for the follow-up questions.

A possible explanation for the strong CI effect is that the increase in reported details reflects a quantity-accuracy trade-off (Koriat & Goldsmith, 1996). Increases in quantity associated with the CI may simply reflect increased guessing, which would show up as a decrease in the accuracy rate. However, the nonsignificant difference in accuracy rates across interviews, which is consistent with the pattern found in most CI studies (Memon et al. 2010), suggests that a quantity-accuracy trade-off did not account for the CI effect in the current study. The CI produced more units of information without compromising the overall accuracy rate.

The strong CI effect in the current study is even more impressive because the SI in the current study was probably better than some control interviews used in past laboratory research on the CI (Memon et al., 2010) and than actual police interviews (Fisher, Geiselman, & Raymond, 1987). The SI in the current study used generally accepted interviewing techniques that have been shown to be beneficial for recall (Fisher et al., 2014). The SI started with building rapport followed by a free recall question, and with no interruptions of the informant's narrative. After free recall, relevant follow-up questions were asked, and suggestive questions were avoided. If the benefits of the CI could be accounted for by the flow of the interview (i.e., rapport building, free recall, follow-up questions) then the SI in the current study should have performed comparably to the CI. However, this was not the case. Given the totality of the results of the current study, the CI appears to be an effective interviewing tool in the context of memory for conversations.

Although the number of relevant units recalled for the CI in the free recall and follow-up questions significantly differed compared to the SI, the benefit of the CI effect was larger for free recall than for the follow-up questions. There are many potential reasons to explain why the CI effect was greater for the free recall than for the follow-up questions. One potential explanation for the increase is that follow-up questions restrict recall to *only* those details related to the topics being asked about whereas free recall allows for an infinite number of details to be recalled. The components of the CI are constructed to increase the quantity of details reported. However, when follow-up questions restrict the number of facts that are needed to answer the question, the potential

for the CI may also be restricted. As a general rule, the less complete is the ideal answer, the less opportunity there is for the CI to be effective.

One CI component, in particular, that may provide insight into the CI's potential being greater for free recall compared to follow-up questions is the model statement. CI interviewers provided informants a model statement to exemplify what an in-depth output should resemble. The model statement helps illustrate to interviewees the amount of detail they should aim for, which helps to increase their free-recall output. When the questions are more restricted, and the expected information is more limited, the model statement does not work as well to increase quantity of reported details. Therefore, the differences in the breadth of the free recall and the follow-up questions, paired with the thorough instructions of the CI (i.e., model statement), may have contributed to the larger CI effect in the free recall versus follow-up questions.

In-person vs. telephone interviews. In real life investigations, it may be easier or safer for law enforcement investigators to interview informants or other witnesses over the telephone instead of in-person. For example, if someone is working as an undercover agent, being seen walking into a police station could be dangerous. Undercover agents might be safer if the interviews were conducted on the telephone. Previous literature has not yet directly compared telephone interviews to in-person interviews for information gathering. The results of the current study suggest that there were no differences between in-person and telephone interviews for total relevant units, correct units, or accuracy rates. The general nonsignificant findings for Modality have important practical implications because it suggests that interview quality is not diminished if the interview is conducted over the telephone compared to in-person. Investigators, therefore, do not

need to worry about losing important information if an interview is conducted over the telephone. Benefits and limitations of telephone interviews are discussed further in the General Discussion.

The only difference to emerge between in-person and telephone interviews was with the number of subjective units being recalled: More subjective units were recalled in-person than over the telephone. Subjective units in the current study were statements that cannot be verified (e.g., his voice reminded me of my cousin). One possible explanation for fewer subjective units being recalled over the telephone is that participants viewed telephone conversations as more formal and, therefore, reported more verifiable facts compared to in-person interviews. A study conducted by Stafford and Daly (1984) found that written responses led to less output than oral responses. Stafford and Daly surmised that the decrease in quantity was due to the more formal structure of writing compared to speaking in-person. Although written responses are not the same as responses given over the telephone, it is possible that telephone conversations may also have a more formal structure that causes a decrease in subjective units. Yet, it is unclear why only subjective units were affected and not other types of irrelevant units as well.

The overall results on Modality suggest that investigators can conduct interviews over the telephone and gather equivalent information as they would in-person. As will be discussed later in the General Discussion the nonsignificant differences between Modalities have important implications when the geographical distance between an investigator and witness or urgency of the interview must be considered.

CI interviews: in-person vs. telephone. Beyond just wanting to know if interviews can be conducted over the telephone, real world investigators also want to

know, more specifically, if information is lost when a CI is conducted over the telephone compared to in-person. For this reason, the third goal of the current study was to directly compare the efficiency of the two CI interviews. The results of the current study found no statistically significant differences between the CI in-person and telephone conditions for total number of relevant units, correct units or overall accuracy rate. Although the differences were not statistically significant, the absolute difference for correct units was substantial ($M_{CI/IP}$ = 54.22; $M_{CI/T}$ = 45.68, respectively). This is especially important, given that there was relatively low power for this comparison (observed power = .16). Note the CI/telephone interviews produced more relevant and correct units than the SI/telephone interviews. Therefore, even if the difference between the CI/in-person and CI/telephone conditions was sizable, it is still preferable to do a CI telephone interview than either of the two SI interviews ($M_{SI/IP}$ = 32.43; $M_{SI/T}$ = 31.71, respectively).

Significant differences between the CI in-person and telephone interviews were found for total subjective and total repeated units, such that more of these units were provided in the in-person compared to the telephone interviews. It is unclear why significant differences between the in-person and telephone interviews were found for only subjective and repeated units. However, the total number of subjective and repeated units were only a small percentage of the total units reported ($M_{CI/in\text{-}person}$ = 12.67%, $M_{CI/telephone}$ = 8.21%). The small absolute difference of subjective and repeated units is therefore unlikely to have much practical importance.

In totality, the comparison of the CI in-person and telephone conditions suggest that there were minimal differences between the efficiency of the in-person compared to

telephone interviews. These results suggest that the CI does not need to be conducted *only* in-person to reap the benefits.

Irrelevant Units

As defined in the current study, irrelevant units are those that do not add any new or relevant information to the output. They merely add inefficiency by lengthening the interview and making it more difficult to isolate relevant units within the informant's answer.

Informant inquiry and "don't know" units may not add relevant information to the overall report, but they are useful in their own right. The number of informant inquiry units can indicate if a procedure is confusing. In addition, "don't know" responses can also be useful in an investigation when determining what a witness can and cannot remember. However, in the current study there were no significant effects of Interview and Modality on total, free, or follow-up informant inquiry responses and "don't know" responses.

The lack of statistically significant differences between the CI and SI for informant inquiry units suggests that participants did not have more questions about the interview process in the CI compared to SI. Note the count for informant inquiry units started after the first recall question was asked and as such, data on questions asked during the instructions were not evaluated. In general, it is expected that participants would have very few questions about the follow-up portion of the interview, as interviewer questions were very specific (e.g., I noticed you did not use any names when describing people. Can you think of any names that were mentioned?). As for the free recall, because the CI has very thorough instructions (compared to the SI) and includes a

model statement for participants to emulate, one might even expect that the CI would lead to fewer questions compared to the SI. However, it is possible that the nonsignificant differences between the CI and SI for informant inquiry units were due to basement effects, as the free recall question for both interviews asked participants to "report everything they remember overhearing," which did not need further clarification. Therefore, the additional instructions that the CI provides helped participants to report information more thoroughly, without causing informants to ask more questions. This has important implications for real-world investigators who may be concerned that the CI is more confusing or cumbersome to the witness compared to a more standard interview procedure. The nonsignificant findings for informant inquiry units in the current study suggest that participants did not find the CI procedure to warrant more questions compared to the SI procedure.

Additionally, the nonsignificant differences between the CI and SI interviews for "don't know" responses were also not surprising, especially for the free recall portion of the interview. In general, people usually do not report "don't know" statements unless they are explicitly asked about something. One possible explanation for the basement effects in the follow-up questions could be that there were only an average of five questions asked and the questions pertained to the main ideas of the overheard conversation. The low number of follow-up questions may have led to low levels of "don't know" responses across both the SI and CI interviews.

Unlike informant inquiry and "don't know" units, not scorable, subjective, and repeated units do not have any "redeeming" qualities; they only add to inefficiency. Informants who received a CI recalled more of these irrelevant details compared to those

who received a SI. This pattern is not surprising, as the CI interviews took twice as long and thus led to more details being reported on average compared to the SI. The higher number of reported irrelevant details in the CI may be considered a cost or wasted time to investigators because these units do not provide helpful information. However, when calculated as a percentage of all units recalled in the entire interview, the irrelevant details were not significantly different for the CI and SI interviews; if anything, the CI led to (non-significantly) proportionally fewer irrelevant details (M_{CI} = 19.85%, M_{SI} = 20.13%, $t(77) = .18$, $p = .10$). Thus, the CI is arguably not less efficient than the SI.

The overall efficiency of the CI (i.e., producing more relevant units but equivalent proportions of irrelevant units) is particularly impressive considering that the CI interviews in the current study were more than twice as long as SI interviews (M_{CI} = 13.33 min, M_{SI} = 6.24). Note the end of both the CI and SI interviews were determined by the informant stating they cannot recall any more information, and not by the interviewer. The longer duration of the CI interviews (compared to SI interviews) seems to reflect that the informants report more total details. Therefore, conducting a CI will take investigators more time, but that time will be rewarded with more overall units at comparable accuracy rates.

Five Targeted Details

There were no significant effects of Interview or Modality for the five targeted details. The outshining hypothesis is a potential mechanism behind the lack of differences between interviews (Smith & Vela, 2001). The outshining hypothesis suggest that when a strong retrieval cue already exists (e.g., a recognition cue), it renders a second retrieval cue as less potent (e.g., interviewer instructions), similar to how a

heavenly body is more difficult to see when it is obscured by a full moon (Smith, 1988). The follow-up questions that participants received were very specific (e.g., "I noticed you did not mention any names. Do you remember overhearing any names?") and therefore, may have been very good retrieval cues for the targeted information. As a result, they may outshine the cues associated with the CI (such as context reinstatement), rendering it less potent. If interviewers did not ask explicit questions pertaining to the five targeted details, the CI effect may have been stronger and resembled the pattern found in the overall data (i.e., more relevant details compared to the SI). With the five targeted details being reported at similar rates in both types of interviews, it is possible that the additional information that the CI produces (compared to the SI) has little investigative utility. Therefore, Study 2 aimed to test this idea by further examining the investigative utility of the CI compared to the SI.

V. STUDY 2 METHOD

Purpose

Study 2 examined the investigative utility of the CI, as compared to the SI, by having student analysts make decisions about upcoming crimes that informants in Study 1 overheard conversations about and reported on in their transcribed interviews. It was hypothesized that that the more information informants in Study 1 reported during their interview the more questions the analyst would be able to answer correctly. Therefore, analysts who received a transcript of a CI interview would answer more questions correctly than those who received a SI interview.

Participants

Study 2 recruited 231 undergraduate students from Florida International University. Seventy participants were removed due to failing to complete the procedure or failing the manipulation checks. The final sample consisted of 157 participants of which 82.7% were female with a mean age of 23. Participants were primarily Hispanic (58.6%), followed by Caucasian (18.5%), Black (16.5%), Asian (1.2%), Native America/ American Indian (.6%), and Other/Mixed (2.5%). All participants received course credit for completing the study via SONA online systems.

Design

The current study was a 2 (Interview: Structured Interview transcript vs. Cognitive Interview transcript) X 2 (Modality: in-person vs. telephone) X 3 (Conversation: 1 vs. 2 vs. 3) between-subjects design.

The main outcome measures were the number of questions that were answered correctly, incorrectly, or labeled as answer not stated/ a non-response, and the accuracy rate of those answers.

Materials

Analyst questionnaire. Analysts answered questions regarding the upcoming crime described in the transcript (see Appendix E). The questions were presented as fill in the blank. For example, the questionnaire may ask, "What time will the thieves break into the house?" and analysts would respond by typing the answer into a blank text box. There were three standardized versions of the questionnaires, one to reflect each of the three conversations from Study 1. Each questionnaire had the same first six questions, to reflect the five main investigative goals of Study 1: What is the crime? Who will be involved? What day will the crime take place? What time will the crime take place? At what location will the crime take place? The sixth question asked participant to list all the people mentioned in the conversation (not just the ones that would be at the future crime). As with Study 1, all names of people were coded as their own separate answer. For example, listing Jenny, John and Jake would be scored as three separate answers. After the six standard questions, each of the three questionnaires then asked 13 additional questions that were unique to the main facts of that specific conversation. The 13 additional questions asked about information for both the future crime and past criminal dealings that were mentioned and may be considered important to a police investigation. Examples of questions included "Based on what the informant has reported, what is the connection between John and Richard? Based on what the informant has reported, what

was stolen during the past robbery?" Note, because questions specifying people's names are scored separately there were a total of 24 answers for each of the three conversations.

After answering the analyst questionnaire, participants answered an additional 10 Likert scale questions regarding their perceptions of the interview from Study 1. Questions focused around (1) how valuable the information from the informant was, (2) how well the interviewer did at eliciting information, and (3) how useful the information gained would be to stop the upcoming crime.

Procedure

The first one third of participants—none of whom participated in Study 1—arrived in a computer lab space at the university in groups of up to 25 and were provided an informed consent form. Upon agreeing to participate, all participants were told that they would be playing the role of an analyst who is one of the members of an intelligence-gathering team and that their job is to decipher information about an upcoming event and answer questions about that event by reading a transcript from an informant who overheard an incriminating conversation. Analysts were told not to guess on any questions. If analysts could not gather the answer from the transcript provided, they were instructed to indicate "answer not stated." All analysts were given a copy of a randomly selected transcript from Study 1 and a Qualtrics link of the analyst-questionnaire that matched that transcript's upcoming event (i.e., stealing tests, smuggling drugs, planning a robbery). After answering all questions, analysts then filled out demographic questions and were fully debriefed and given credit for their participation. Due to unforeseen circumstances the final two thirds of participants completed the study solely online. All

study procedures and documents were the same except that analysts no longer came into a lab space and instead received the study materials via an online system.

Coding

Answers in Study 2 were coded against ground truth from the originally recorded conversation and not based on the reported details in the Study 1 transcripts. For example, if in the original conversation the statement "John is a biology student" is given and the informant reports that "John is a law student," if the analyst then answers that "John is a law student," the answer would be incorrect even though the analyst correctly reported what the informant said. The reason Study 2 answers were coded based on the original conversation (and not on informant recollection) was to better assess investigative utility (i.e., can investigator *use* the information provided to answer needed questions about an upcoming crime).

The analyst questionnaire responses were scored as either correct, incorrect, or "answer not stated" (non-response). Before coding began, a master answer key was created for each conversation that reflected the correct answers for each question based on the originally recorded conversation (ground truth). Each conversation had two answer keys, one reflecting a strict criterion and the other a lenient criterion. The strict criterion required the exact names, times, and responses based on the original conversation. For example, if the original conversation stated that Jordan was selling drugs, then the correct answer to "Who was selling drugs?" would be "Jordan." The lenient criterion required an answer to be correct, but either incomplete or imprecise. For example, a correct answer to the question "Who was selling drugs?" based on the lenient coding scheme could be "the female party planner." Regardless of coding scheme,

analysts had the option to select “answer not stated” if they believed the informant did not provide the answer to the question. These answer-not-stated responses were coded as a non-response. In addition to the explicit answer-not-stated option, responses that were correct but too vague to be considered informative were also coded as a non-response. For example, the correct answer to the question “What was John’s profession” is “a biology graduate student.” If an analyst responded with the answer “student” this would be marked as a non-response because although it is technically incorrect, it is not informative enough to be helpful to police—given that there are tens of thousands of students on campus. All other answers were considered incorrect. Analyses were conducted using both coding schemes. Accuracy rate was calculated as total correct answers divided by total correct plus total incorrect answers.

A primary coder scored all 161 questionnaires and a secondary coder scored a randomly selected subset (33% overlap). An interrater reliability analysis using Kappa statistic was performed on all dependent variables to determine consistency among raters (Landis & Koch, 1977). A moderate to strong reliability was found all Kappas = .58-1.

VI. STUDY 2 RESULTS

As in Study 1, preliminary analyses were conducted to check for differences among the three conversation transcripts that participants received. Conversation interacted with some of the other factors. Therefore, Conversation was included as an independent variable in the below analyses.

Two questions from Conversation 1 and two questions from Conversation 2 were removed after preliminary analyses. The questions were removed because a majority of responses showed a clear misinterpretation of the question. For example, the answer to the question "How is the person with the drugs able to get them?" is "he takes them from evidence" however, a majority of participants misinterpreted the question and answered "flying them in/ using a jet to smuggle the drugs/ transporting them by plane." These answers show that the participants were confused by which "person with drugs" the researcher was asking about and therefore the questions were removed. The removal of questions from Conversation 1 and 2 but not Conversation 3 led to an unequal number of questions being asked. Therefore, all of the ensuing analyses were conducted on the proportion—rather than number—of correct, incorrect, and non-response answers out of the total number of questions asked.

A series of 2 X 2 X 3 between factorial ANOVAs were conducted to assesses the effects of Interview, Modality, and Conversation on proportions of correct answers, incorrect answers, non-response answers, and accuracy rate. Results are first presented based on the strict coding scheme and then on the lenient coding scheme. Additional results regarding the utility questionnaire are presented last.

Strict Coding

Proportion correct. There was a significant main effect of Interview, $F(1, 149) = 5.59$, $p = .02$, $\eta_p^2 = .04$, observed power = .65, such that those receiving CI-generated transcripts ($M = .28$) provided a significantly higher proportion of correct answers than those receiving SI-generated transcripts ($M = .23$). There was also a marginally significant main effect of Modality, $F(1, 149) = 3.61$, $p = .06$, $\eta_p^2 = .02$, observed power = .47, such that those interviewed in-person ($M = .27$) had a marginally higher proportion of correct answers than those who were interviewed over the telephone ($M = .25$). There was no significant interaction between Interview and Modality, $F(1, 149) = .27$, $p = .60$, $\eta_p^2 = .00$, observed power = .08.

There was no significant main effect of Conversation, $F(1, 149) = .88$, $p = .42$, $\eta_p^2 = .01$, observed power = .20. There was, however, an interaction between Conversation and Interview, $F(1, 149) = 4.88$, $p < .01$, $\eta_p^2 = .06$, observed power = .80. Simple main effects revealed that for Conversation 2 those who received a CI-generated transcript reported a significantly higher proportion of correct answers than those who received a SI-generated transcript, $F(1, 155) = 7.10$, $p < .01$. A similar pattern was found for Conversation 1—CI-generated transcripts led to more correct answers than SI-generated transcripts—although the pattern was non-significant, $F(1, 155) = 3.41$, $p = .07$. There were no significant differences between CI-generated and SI-generated transcripts in the proportion of correct answers found for Conversation 3, $F(1, 155) = .49$, $p = .48$. There was no significant interaction between Conversation and Modality, $F(1, 149) = 1.45$, $p = .24$, $\eta_p^2 = .02$, observed power = .31, and there was also no significant three-way

interaction between Conversation, Interview, and Modality, $F(1, 149) = .96$, $p = .39$, $\eta_p^2 = .01$, observed power = .22.

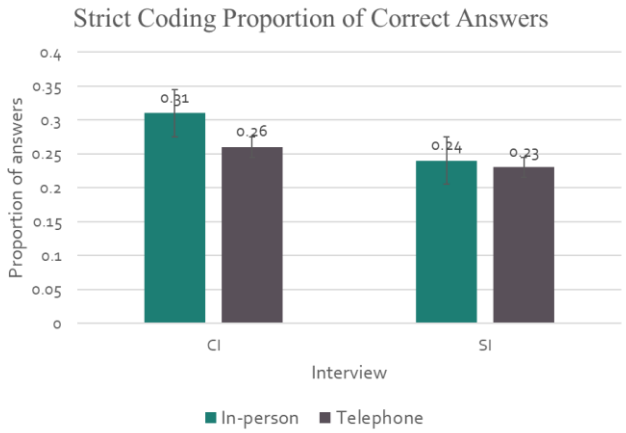

Figure 19. Mean proportions of strictly coded correct answers as a function of Interview and Modality

Proportion incorrect: There was a significant main effect of Interview, $F(1, 149) = 4.78$, $p = .03$, ηp2 =.03, observed power = .58, such that those receiving CI-generated transcripts ($M = .16$) reported a significantly higher proportion of incorrect answers than those receiving SI-generated transcripts ($M = .13$). There was no significant main effect of Modality, $F(1, 149) = 2.30$, $p = .13$, $\eta_p^2 = .02$, observed power = .33. The main effect of Interview was qualified by a marginally significant interaction between Interview and Modality, $F(1, 149) = 3.80$, $p = .05$, $\eta_p^2 = .03$, observed power = .49. Simple main effects revealed that for in-person interviews there was no significant difference between the proportion of incorrect answers reported by those who received CI-generated transcripts and those who received SI-generated transcripts, $F(1, 157) = .04$, $p = .84$. For those interviewed over the telephone a significantly higher proportion of incorrect answers were reported by those who received a CI-generated transcript compared to those who received a SI-generated transcript, $F(1, 157) = 10.65$, $p < .01$.

There was no significant main effect of Conversation, $F(1, 149) = 1.53$, $p = .22$, $\eta_p^2 = .02$, observed power = .32. There were no significant interactions between Conversation and Interview, $F(1, 149) = .07$, $p = .93$, $\eta_p^2 = .00$, observed power = .06, or between Conversation and Modality, $F(1, 149) = 1.97$, $p = .14$, $\eta_p^2 = .03$, observed power = .40. There was also no significant three-way interaction between Conversation, Interview, and Modality, $F(1, 149) = .04$, $p = .96$, $\eta_p^2 = .00$, observed power = .06.

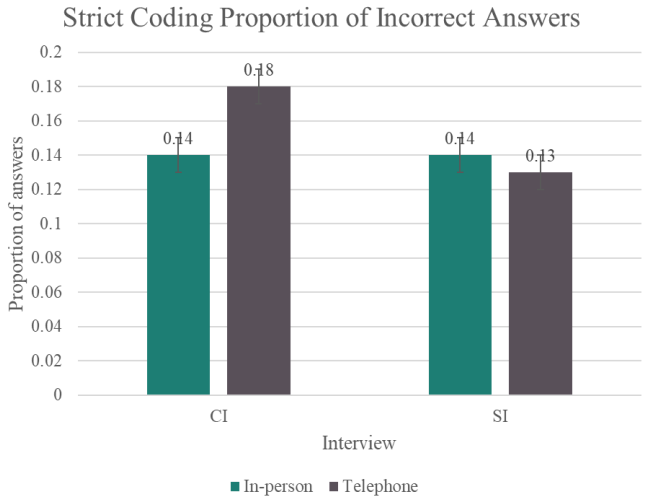

Figure 20. Mean proportions of strictly coded incorrect answers as a function of Interview and Modality

Proportion non-response: There was a significant main effect of Interview, $F(1, 149) = 9.52$, $p < .01$, $\eta_p^2 = .06$, observed power = .87, such that those who received a CI-generated transcript ($M = .52$) had a significantly lower proportion of non-response answers than those who received a SI-generated transcript ($M = .59$). There was no significant main effect of Modality, $F(1, 149) = 1.28$, $p = .26$, $\eta_p^2 = .01$, observed power = .20, or significant interaction between Interview and Modality, $F(1, 149) = .14$, $p = .71$, $\eta_p^2 = .00$, observed power = .07.

There was no significant main effect of Conversation, $F(1, 145) = .29$, $p = .75$, $\eta_p^2 = .00$, observed power = .10. There was a significant interaction between Conversation and Interview, $F(1, 145) = 3.84$, $p = .02$, ηp2 =.05, observed power = .69. A simple main effects analysis revealed that for Conversations 1 and 2 those who received CI-generated transcripts reported a significantly lower proportion of non-response answers than those who received a SI-generated transcript, $F(1, 155) = 5.53$, $p = .02$, $F(1, 155) = 8.78$, $p < .01$, respectively, but for Conversation 3 there was no difference between those who received a CI-generated transcript and those who received a SI-generated transcript, $F(1, 155) = .00$, $p = .99$. There were no significant interactions between Conversation and Modality, $F(1, 149) = 2.77$, $p = .07$, $\eta_p^2 = .04$, observed power = .54. There was also no significant three-way interaction between Conversation, Interview, and Modality, $F(1, 149) = .64$, $p = .53$, $\eta_p^2 = .01$, observed power = .16.

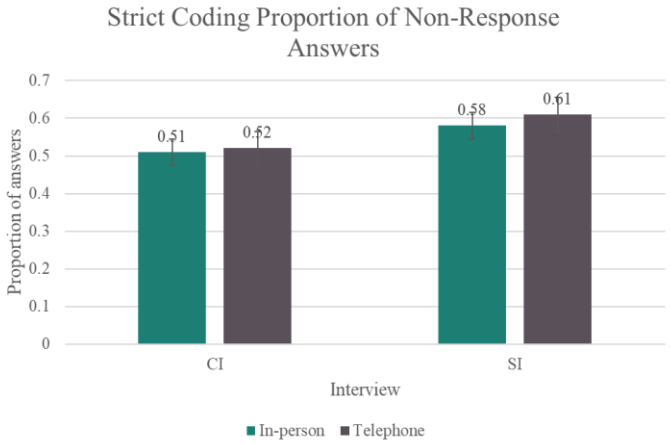

Figure 21. Mean proportions of strictly coded non-response answers as a function of Interview and Modality

Accuracy rate. There was no significant main effect of Interview, $F(1, 149) = .71$, $p = .40$, $\eta_p^2 = .01$, observed power = .13. There was a significant main effect of Modality, $F(1, 149) = 4.88$, $p < .03$, $\eta_p^2 = .03$, observed power = .59, such that those who

received the transcript of in-person interviews (M = .62) had significantly higher accuracy rates than those who received the transcript of telephone interviews (M = .57). There was no significant interaction between Interview and Modality, $F(1, 149) = 1.52$, $p = .22$, $\eta_p^2 = .01$, observed power = .23.

There was no significant main effect of Conversation, $F(1, 149) = .37$, $p = .69$, $\eta_p^2 = .01$, observed power = .12. There was a significant interaction between Conversation and Interview, $F(1, 149) = 3.16$, $p < .05$, $\eta_p^2 = .04$, observed power = .60. Simple main effects revealed that for Conversation 2 those who received a CI-generated transcript reported higher accuracy rates than those who received a SI-generated transcript, $F(1, 155) = 4.55$, $p < .04$. There were no significant differences in the accuracy rate of answers found for Conversation 1, $F(1, 155) = .00$, $p = .98$ or Conversation 3, $F(1, 155) = .58$, $p = .45$. There was no significant interaction between Conversation and Modality, $F(1, 145) = .02$, $p = .98$, $\eta_p^2 = .00$, observed power = .05. There was also no significant three-way interaction between Conversation, Interview, and Modality, $F(1, 149) = .09$, $p = .91$, $\eta_p^2 = .00$, observed power = .06.

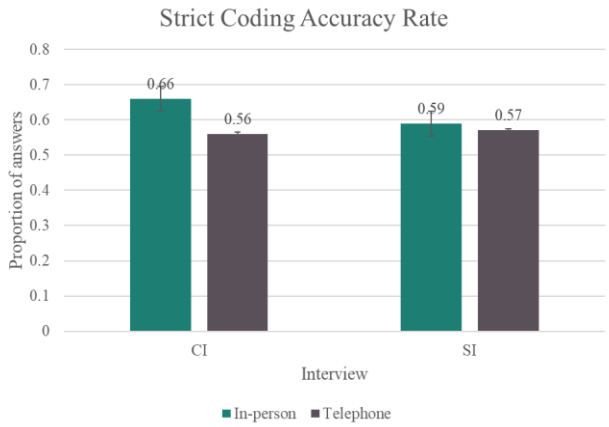

Figure 22. Strictly coded accuracy rate as a function of Interview and Modality

Lenient Coding

Proportion correct: There was no significant main effect for Interview, $F(1, 149) = 3.39$, $p = .07$, $\eta_p^2 = .02$, observed power = .45, although results were trending in the same direction as the strict coding: Proportionally more correct answers for those who received a CI-transcript than those that received a SI-transcript. There was a significant main effect of Modality, $F(1, 149) = 4.99$, $p = .03$, $\eta_p^2 = .03$, observed power = .60, such that those who received transcripts of in-person interviews ($M = .36$) provided a significantly higher proportion of correct answers than those who received transcripts of telephone interviews ($M = .33$). There was no significant interaction between Interview and Modality, $F(1, 149) = .19$, $p = .67$, $\eta_p^2 = .00$, observed power = .07.

There was a significant main effect of Conversation, $F(1, 149) = 4.8$, $p = .01$, $\eta_p^2 = .06$, observed power = .79. Post hoc analysis revealed that a significantly higher proportion of correct answers were provided in Conversation 2 ($M = .38$) compared to Conversation 1 ($M = .30$). There were no significant differences between Conversation 3 ($M = .34$) and either Conversations 1 or 2. There were no significant interactions between Conversation and Interview, $F(1, 149) = 2.32$, $p = .10$, $\eta_p^2 = .03$, observed power = .46, or between Conversation and Modality, $F(1, 149) = .96$, $p = .38$, $\eta_p^2 = .01$, observed power = .22. There was also no significant three-way interaction between Conversation, Interview, and Modality, $F(1, 149) = .34$, $p = .71$, $\eta_p^2 = .01$, observed power = .10.

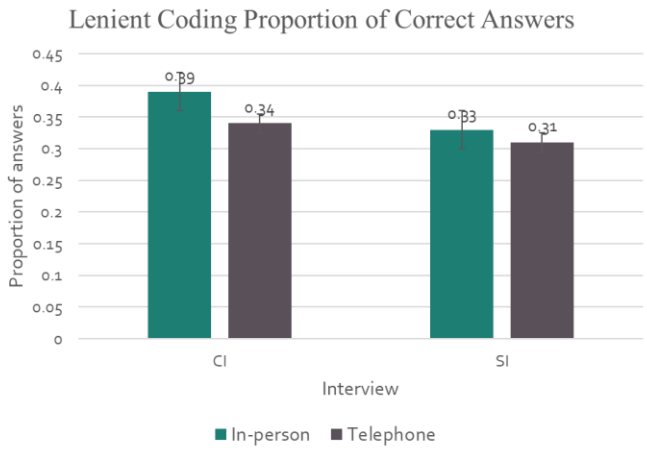

Figure 23. Mean proportion of leniently scored correct answers as a function of Interview and Modality

Proportion incorrect. There was a significant main effect of Interview, $F(1, 149) = 4.78$, $p = .03$, $\eta_p^2 = .03$, observed power = . 58, such that those who received a CI-generated transcript ($M = .16$) reported a significantly higher proportion of incorrect answers compared to those who received a SI-generated transcript ($M = .13$). There was no significant main effect of Modality, $F(1, 149) = 2.30$, $p = .13$, $\eta_p^2 = .02$, observed power = .33. The main effect of interview was qualified by a marginally significant interaction between Interview and Modality, $F(1, 149) = 3.78$, $p = .05$, $\eta_p^2 = .03$, observed power = . 49. Simple main effects revealed that for in-person interviews there was no significant difference between the proportion of incorrect answers reported by those who received CI-generated transcripts and those who received SI-generated transcripts, $F(1, 157) = .04$, $p = .84$. For those interviewed over the telephone a significantly higher proportion of incorrect answers were reported by those who received a CI-generated transcript compared to those who received a SI-generated transcript, $F(1, 157) = 10.65$, $p < .01$.

There was no significant main effect of Conversation, $F(1, 149) = 1.53$, $p = .22$, $\eta_p^2 = .02$, observed power = .32. There were no significant interactions between Conversation and Interview, $F(1, 149) = .07$, $p = .93$, $\eta_p^2 = .00$, observed power = .06, or between Conversation and Modality, $F(1, 149) = 1.97$, $p = .14$, $\eta_p^2 = .03$, observed power = .40. There was also no significant three-way interaction between Conversation, Interview, and Modality, $F(1, 149) = .04$, $p = .96$, $\eta_p^2 = .00$, observed power = .06.

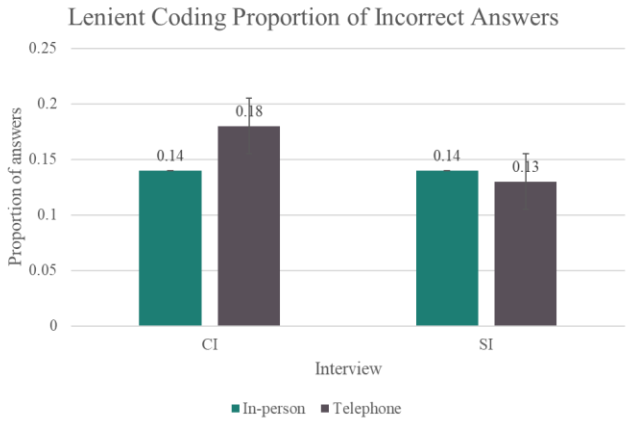

Figure 24. Mean proportions of leniently coded incorrect answers as a function of Interview and Modality

Proportion non-response. There was a significant main effect of Interview, $F(1, 149) = 7.21$, $p < .01$, $\eta_p^2 = .05$, observed power = .76, such that those who received a CI-generated transcript ($M = .43$) reported a significantly lower proportion of non-response answers than those who received a SI-generated transcript ($M = .50$). There was no significant main effect of Modality, $F(1, 149) = 2.28$, $p = .13$, $\eta_p^2 = .02$, observed power = .32, or significant interaction between Interview and Modality, $F(1, 149) = .20$, $p = .65$, $\eta_p^2 = .00$, observed power = .07.

There was no significant main effect of Conversation, $F(1, 149) = 2.58$, $p = .08$, $\eta_p^2 = .03$, observed power = .51. There were no significant interactions between

Conversation and Interview, $F(1, 149) = 1.98$, $p = .14$, $\eta_p^2 = .03$, observed power = .40, or between Conversation and Modality, $F(1, 149) = 2.35$, $p = .10$, $\eta_p^2 = .03$, observed power = .47. There was also no significant three-way interaction between Conversation, Interview, and Modality, $F(1, 149) = .21$, $p = .81$, $\eta_p^2 = .00$, observed power = .08.

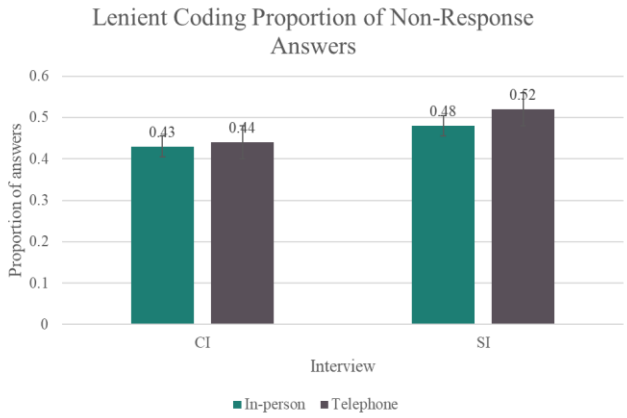

Figure 25. Mean proportions of leniently coded non-response answers as a function of Interview and Modality

Accuracy rate. There were no significant main effects of Interview, $F(1, 149) = .16$, $p = .69$, $\eta_p^2 = .00$, observed power = .07. There was a significant main effect of Modality, $F(1, 149) = 7.26$, $p < .01$, $\eta_p^2 = .05$, observed power = .76, such that those who received a transcript of an in-person interview ($M = .70$) had a significantly higher accuracy rates than those who received a transcript of a telephone interview ($M = .65$). There was no significant interaction between Interview and Modality, $F(1, 149) = 2.81$, $p = .10$, $\eta_p^2 = .02$, observed power = .38.

There was a significant main effect of Conversation, $F(1, 149) = 3.88$, $p = .02$, $\eta_p^2 = .05$, observed power = .69. Post hoc analysis revealed that accuracy rates were significantly higher for Conversation 2 ($M = .72$) compared to Conversation 1 ($M = .64$). There were no significant differences between accuracy rates for Conversations 2 and 3

(M = .66) or between Conversations 3 and 1. There were no significant interactions between Conversation and Interview, $F(1, 149) = 1.38$, $p = .26$, $\eta_p^2 = .02$, observed power = .29, or between Conversation and Modality, $F(1, 149) = .48$, $p = .62$, $\eta_p^2 = .01$, observed power = .13. There was also no significant three-way interaction between Conversation, Interview, and Modality, $F(1, 149) = .10$, $p = .91$, $\eta_p^2 = .00$, observed power = .07.

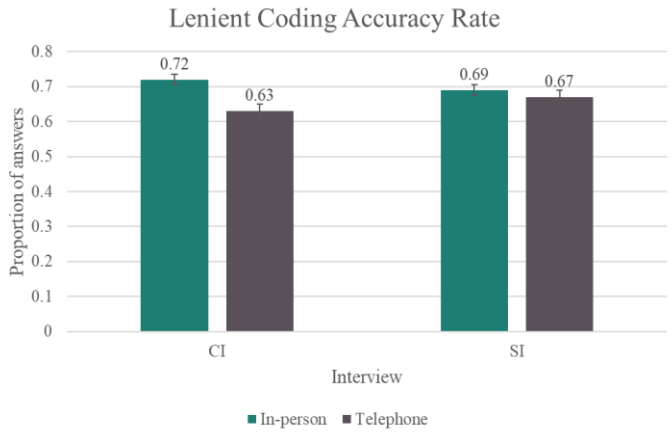

Figure 26. Leniently coded accuracy rate as a function of Interview and Modality

Utility Questionnaire

A series of 2X2 ANOAVAs were conducted between Interview and Modality on each of the questions. No significant main effects or interactions were found. See Table 7 for the mean scores of each question.

VII. STUDY 2 DISCUSSION

The results of the strict coding scheme replicated a familiar pattern in the CI literature, but with analysts rather than witnesses: Analysts who received a CI transcript produced more correct responses compared to analysts who received a SI transcript, and there was no significant difference in the accuracy rate across the two interviews.

When the data were scored with the lenient criterion, a weaker pattern appeared. To remind the reader, the only difference between the strict and lenient scoring criteria is that incomplete answers were scored as correct in the lenient scoring but were scored as a non-response (neither correct nor incorrect) in the strict scoring. (For example, the correct, complete answer to the question "Where did the two people meet to exchange the exams?" is "in the gold parking garage." Answers such as "in *a* parking garage" were considered "incomplete" because the full details are not provided, yet no commission errors are present.) When the lenient scoring criterion was applied, CI superiority for correct answers was only marginally significant, (p = .07). What does that tell us about the CI's utility in conducting criminal investigations? It seems that the CI's superiority over the SI may have been more likely to occur when a more precise response was required. When a less complete response was required, it is possible the benefit of conducting a CI is lessened. Therefore, it could be expected that CI interviews with informants will be more useful than SI interviews, but only for more complex crimes, where more precise information is required to solve the crime. For example, counter-terrorism investigators will find it more useful to know that an upcoming attack is planned for 9:25 PM compared to just knowing the attack is planned for nighttime. The exact time will allow investigators to better plan their investigation and response (stakeout the location, call in back-up, plan a sting, etc.). For less complex cases, where less-detailed information is required, the CI may not be any more valuable than the SI. Therefore, investigators should consider the type of information they are trying to elicit before choosing the appropriate type of interview.

Unlike Study 1 where there were no significant effects of Modality on correct responses, there was a significant effect found in Study 2. Analysts who received a transcript of an in-person interview reported more correct answers and had higher accuracy rates than those who received transcripts of telephone interviews. The increase in correct responses may suggest that in-person interviews produce more useful information for an analyst than telephone interviews.

It is important to note that in the current study, both in-person and telephone interviewers took place after a two-day delay. In the real world, this may not be the case with telephone interviews allowing for more immediacy whereas in-person interviews may have longer delays between the critical event and the interview. It is possible that immediate telephone interviews may perform similar to (or better) than in-person interviews that follow a delay. Interviewers, therefore, may need to take into account the type of information they want to elicit and the cost/benefits of each interview modality before deciding if an in-person or telephone interview will be more appropriate. Costs and benefits of each interview modality are explored in the General Discussion.

In the current study, Conversation interacted with the type of Interview, such that the CI effect was found in Conversation 2, but not in Conversations 1 or 3. As all conversations were approximately the same length and contained the same general details, it is unclear why the CI was effective for some conversations but not for others. It is possible that the questions were more difficult in some conversations compared to others, as the CI effect was found only for the conversation with the highest accuracy rate and not in the conversation with the lower accuracy rate. Therefore, future research may want to examine different types of conversations and questions to better determine when

the CI is effective—and perhaps how the CI can be modified to adjust to the new conversational context.

VIII. GENERAL DISCUSSION

The first goal of the current studies was to test the CI (compared to SI) in the context of memory for conversations. A large CI effect was found for Study 1, in which the CI produced more relevant and more correct units of information compared to the SI, without compromising accuracy. The large CI effect was not surprising as the CI is purely process-oriented and has been shown to outperform the SI in a number of contexts (Fisher & Geiselman, 2018). The results of Study 1 suggest that the CI has a strong ability to adapt to different content areas, including memory for conversations.

There are many contexts, especially related to national security, in which investigators want to elicit information that was overheard in conversation. Specifically, investigators may question persons of interest about meetings they attended that may have contained relevant facts about an upcoming attack. Investigators may also question others about conversations they overheard but did not participate in (e.g., overhearing two family members speaking). Unrelated to national securities, eliciting conversational information can also be relevant to child sexual abuse cases in which investigators need to learn more about the specifics of the initial disclosure. Oftentimes, parents are asked to recall conversations they had with their children regarding the initial disclosure of abuse (Korkman et al., 2015). For initial disclosures of abuse, it is important for investigators to know who first brought up the abuse.

Beyond the context in which a conversation may be overheard, gathering more information about those conversations is of high importance. The more information that can be gathered, the better intelligence organizations can protect national securities. Higher quantities of information can also help intelligence task forces to better verify

information (e.g., similar detailed information from multiple sources may better predict accuracy). Study 1 demonstrated that the CI is an efficient tool and investigators should strongly consider the use of the CI when gathering intelligence information that was overheard in conversation.

Almost all the research on the CI up until now has focused on the CI's ability to generate more information (compared to a SI), but almost none of these studies have shown that the additional information actually helped investigators to better perform their work-related tasks. Therefore, the second purpose of the current studies was to examine the investigative utility of the CI. Prior to the current study, only one other study had examined the investigative utility of the CI, finding support that the CI better helped police officers in job-related tasks compared to the SI (Satin & Fisher, 2018). After gathering reports from eyewitnesses, police investigators next need to *find* the perpetrator. Participants in the Satin and Fisher (2018) study used CI or SI-generated details to find and select a perpetrator among a 10-person photo line-up. The study found that officers who received CI-generated descriptors were more likely to select the correct perpetrator and allocate more investigative resource hours to the correct person, compared to those who got SI-generated descriptors (Satin & Fisher, 2018). Investigative utility in the current study was measured by how helpful the provided information was to student analysts when determining when and how an upcoming crime was going to occur. Results of Study 2 replicated Study 1 findings, such that analysts were more likely to use the CI generated transcripts to correctly predict information about the upcoming crime compared to those who received SI generated transcripts. However, analysts completed the task at a comparable accuracy rate for both CI and SI generated transcripts.

The CI effect, however, did not hold for all Conversations, as the effect was found only in Conversation 2—although, note that Conversation 1 was trending in the same direction (p = .07). The absence of an effect for all Conversations shows the importance of stimulus sampling. At the current time, it is unclear why the CI advantage did not obtain for all the Conversations, but future research should continue to stimulus sample with different conversation scenarios to better explore this odd finding. The results suggest that the CI effect may be weaker for some conversational contexts than others. Therefore, researchers should investigate different types of conversations to better determine what was obscuring the CI effect. If research can determine which kinds of conversations the CI was and was not helpful for investigators can more efficiently select the kind of interview protocol that would be appropriate. In addition, knowing what kinds of conversations obscure the CI effect will help researchers to determine how the CI can be modified to adjust to the new conversational context.

In addition, the CI effect did not hold for all coding schemes. The CI effect only appeared in the stricter coding scheme (compared to lenient), suggesting that there is something about the CI that makes it more sensitive when more exact answers are required. For example, in a national securities situation eliciting more exact answers—the exact day of an upcoming attack—will be more valuable than vague or partial answers (e.g., "the attack will happen either tomorrow or Thursday"). However, for less complex cases it may suffice to elicit partial information, "I think I heard them say they were going to meet to exchange the drugs at either 1 or 4pm, sometime in the afternoon."

Although analysts who received a CI (compared to an SI) reported more correct answers under strict coding, overall accuracy rates were not high enough to conclude that

either interview had strong investigative utility. The moderate accuracy rates across both interviews suggests that there may have been something unique about the measure of utility being used, such that the questions elicited a high number of incorrect responses from both interview types.

The current study was the first to investigate if there were differences in amount of information gathered between in-person and telephone interviews. Prior research on disclosing sensitive or stigmatizing information has found in-person and telephone interviews to produce the same rate of disclosures (Rosenbaum et al., 2006). A similar pattern of results was found in the current study for Study 1, in which telephone and in-person interviews did not significantly differ regarding the quantity of correct information gained. The results of Study 1 suggested that investigators are not losing important information when they conduct their interviews (CI or SI) over the telephone compared to in-person, and more specifically, investigators will also not lose information if they conduct a CI over the telephone compared to in-person. However, in Study 2 modality of the interview did influence results, such that the in-person interview transcripts led to a higher proportion of correct information being reported compared to the telephone interview transcripts. The difference between Studies 1 and 2 suggests that although both in-person and telephone interviews generate the same quantity of information, the in-person interviews may elicit more useful reports compared to telephone interviews. Interviewers should therefore weigh the type of information they aim to gather with the type of interview that is most appropriate for the situation. Although analysts were more knowledgeable about the upcoming crime after reading an in-person interview compared to telephone interview, the benefits in the real world of

being able to conduct a telephone interview may outweigh the potential loss of information. The interviewer will have to weigh the costs and benefits of each type of interview for each new interview situation.

There are obvious practical benefits to being able to conduct telephone interviews compared to in-person interviews that interviewers should consider. For example, investigators are not always in the same location as the person they are trying to interview. For logistical reasons, telephone interviews may therefore be easier to conduct compared to in-person interviews. Telephone interviews may also be more economical when the distance between the interviewer and witness is a factor. Not having to pay for travel to conduct the interview may be particularly important during times of economic crisis where institutions may have restricted budgets. Telephone interviews are also more efficient to conduct when the information is of more immediate use. For example, if an undercover police officer gains new intelligence information about an event that is happening within the immediate future, relaying that information over the telephone may allow police officers the needed time to gather the resources to stop the crime. Along with being interviewed immediately, telephone interviews also allow witnesses to be interviewed at a place and time that is convenient to them. Prior research on disclosures found higher rates of participation for telephone versus in-person interviews (Rosenbaum et al., 2006). The practicality of telephone interviews may increase the likelihood that an interview with a witness actually happens.

However, there are also some limitations to telephone interviews to consider. Some types of interviews may not be appropriate to conduct over the telephone. Interviews about personal or intimate experiences (e.g., sexual assault, domestic

violence) may require more rapport building to make a witness/victim feel more comfortable. Rapport may be easier to build in-person compared to over the telephone.

In addition, informants or witnesses may sometimes be asked to sketch or re-enact something they witnessed. For example, an undercover agent may sketch the layout of a building in which a known criminal operates. The sketch will then better allow a SWAT team to maneuver around the inside of the building. Such tasks (i.e., sketching) may be harder to incorporate successfully over the telephone (or at least on a telephone without video features) compared to in-person.

Given the differences between in-person and telephone interviews, investigators should decide which interview modality is best for the specific context. For in-person interviews, the investigator usually selects the location and environment in which the interview is going to take place. For telephone interviews, investigators may not have any control over the environment in which the witness is located, and therefore cannot control background distractions. Investigators will have to remind or request that the witness find a quiet place, free of distractions, before the interview begins. A quiet environment may better help the witness to focus on the current task instead of background distractions.

In addition, for interviews conducted in-person, investigators can show witnesses that they are listening through non-verbal behavior, (e.g., nodding their heads). Non-verbal behaviors can indicate to the witness that the detective is still listening and that the witness should continue with their free response. However, the luxury of seeing one another is lost over the telephone. Instead, investigators should vocalize periodically during free recall to indicate to the speaker someone is still listening, and the call was not

disconnected. Investigators must balance the appropriate number of times to vocalize: Enough times such that the witness knows the investigator is still there but not so often that the witnesses' recall is continuously interrupted.

A consideration specific to the CI is the idea of closing one's eyes. During free-recall witnesses are encouraged to close their eyes to help them focus. Research on interviews conducted over a videoconferencing system suggests that participants may feel less intimated when interviews are conducted over the video software (compared to in-person), because they can look away or close their eyes without feeling pressure from the interviewer's presence (Kuivaniemi-Smith et al., 2014). In normal conversation, not looking at the person you are talking with can be considered rude, and thus the feeling of being rude (i.e., breaking social norms) may distract the witness from their free recall. Therefore, instructing witnesses to close their eyes may be easier in telephone interviews (compared to in-person) as the feeling of someone "watching you" will not be as salient.

Another consideration specific to conducting the CI over the telephone is that investigators will need to make sure to explicitly describe some of their non-verbal behaviors. For example, when conveying the model statement, interviewers should close their eyes before offering the model statement to convey the amount of mental concentration required to report a detailed description. However, if the interview is conducted over the telephone, witnesses will not notice that the interviewer is closing their eyes. Interviewers should then state verbally when demonstrating the model statement that they are closing their eyes to concentrate better. Describing verbally the non-verbal behavior will help witnesses to model those same behaviors in their own free recall.

With the above considerations in mind, interviewers will thus need to balance the relative values of in-person interviews and telephone interviews. On one hand, in-person interviews in the current study tended to lead to higher proportions of useful information being reported (compared to telephone interviews). In addition, a generally held belief is that in-person interviews may allow for better rapport building between the interviewer and the interviewee. In-person interviews also better allow for the use of non-verbal communication (e.g., sketching, showing active listening, etc.). On the other hand, telephone interviews may be a safer option for informants and undercover officers who do not want to be seen talking with a member of law enforcement. Telephone interviews may also be logistically easier to conduct as both parties can communicate from a convenient location. The convenience of the telephone interview may also make them more economically feasible in cases where the interviewer would have to travel great distances to meet with an interviewee. Note that remote interviewing will also be more prevalent in times of national pandemic (e.g., COVID-19) and thus knowing the costs and benefits of telephone interviews will prove to be beneficial. Therefore, interviewers will have to balance the costs and benefits of in-person and telephone interviews depending on the specific context/investigation in which they are working.

Concluding Remarks

In conclusion, the CI has shown to be an exceptional tool for eliciting information about an overheard conversation compared to the SI. In addition, the CI shows value when more precise information is required. The findings from the current study have practical importance in human intelligence and national securities context (among others) in which eliciting precise information may be weighed more heavily. The current study

was also the first to compare in-person and telephone interviews for information gathering. Results suggest that quantity of information gain is similar across both interview modalities. However, Study 2 indicated that in-person interviews may produce more useful details than telephone interviews. Investigators should consider the costs and benefits of each type of interview before making a decision on interview modality.

Limitation

Participants in the current study played a passive role, as the conversations they overheard were pre-recorded. Not being an active member in the conversation could have affected overall motivation levels to retain the conversations. However, sometimes in human intelligence gathering situations people are interviewed about events that seemed mundane and unimportant to them at the time. The current study may better represent interviews with passive informants compared to interviews with a more active informant.

In addition, interviewers in the current study were restricted to only asking an average of five follow-up questions. The cap on the number of questions may have limited the amount of information that could have been gained, thus limiting the ecological validity, as real-world interviewers can ask as many questions as they see fit. Further, limiting the five follow-up questions to the topics of the five targeted details may have also limited the breadth of the information that was gathered, which in turn may have hindered the performance of analysts in Study 2 who were asked questions beyond just the main five targeted details.

Finally, in real-life situations an analyst is usually an expert in the case-related background (e.g., an expert in the region of the world, in the terrorist organization etc.).

Already being an expert means that analysts may possess specific knowledge about the case-related facts even before being presented with information from an interviewer. The prior knowledge may help analysts to more quickly process the newly presented information, as they already have a script of related details. The student analysts in the current study did not possess any prior background other than that the transcript they were about to view regarded a crime. If student analysts were provided some background, or if conversations related to topics students had expertise in, it is possible the accuracy for the investigative utility measure would have been higher.

Future Directions

Future research should aim to increase ecological validity by using a more real-world setting with real investigators. Without the experimental constraints on internal validity, investigators in the real world may elicit a different pattern of information (e.g., high quantities in the follow-up questions compared to free recall). Increasing informants' active participation in the conversation may also affect the amount of information that they recall. Informants who play an active role may recall more information, as the information pertains to the self. Researchers should investigate if overall quantity recall of the conversation would increase compared to when the conversation is passively overheard. The results of comparing passive and active participation may have practical implications for human intelligence interviews in which some interviewees play only a passive role. In addition, future research should increase the knowledge of the analyst by either providing case relevant facts ahead of time or having informants converse about topics that a student analyst would be an expert (e.g., current school event, school policies, etc.) Providing analysts with prior knowledge

would be another way to increase the ecological validity of the study while still maintaining high internal validity in a laboratory setting.

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Table 1.

Study 1: Mean number of relevant units (standard deviation) as a function of interview and modality.

	Cognitive Interview	Structured Interview	Mean
In-person Interview			
Free Recall	38.61(20.16)	20.67(9.61)	28.95(17.68)
Follow-up	28.50(14.54)*	17.43(9.86)	22.54(13.30)
Total Recall	67.11(25.45)	38.10(16.71)	51.49(25.52)
Telephone Interview			
Free Recall	37.58(14.61)	19.57(10.01)	28.13(15.26)
Follow-up	19.84(8.63)*	19.67(11.06)	19.75(9.85)
Total Recall	57.42(17.84)	39.24(18.69)	47.88(20.26)
Mean			
Free Recall	38.08(17.29)**	20.12(9.71)**	28.53(16.40)
Follow-up	24.05(12.50)*	18.55(10.41)*	21.13(11.69)
Total Recall	62.14(22.12)**	38.67(17.52)**	49.66(22.93)

$p < .05$ *; $p < .001$ **

Table 2.

Study 1: Mean number of correct units (standard deviation) as a function of interview and modality.

	Cognitive Interview	Structured Interview	Mean
In-person Interview			
Free Recall	32.33(17.89)	18.05(8.44)	24.64(15.25)
Follow-up	21.89(10.68)	14.38(7.97)	17.85(9.94)
Total Recall	54.22(21.98)	32.43(13.77)	42.49(20.91)
Telephone Interview			
Free Recall	30.26(13.29)	16.43(8.29)	23.00(12.87)
Follow-up	15.42(7.68)	15.29(9.71)	15.35(8.69)
Total Recall	45.68(15.53)	31.71(16.46)	38.35(17.74)
Mean			
Free Recall	31.27(15.51)**	17.24(8.30)**	23.81(14.03)
Follow-up	18.57(9.70)	14.833(8.78)	16.58(9.35)
Total Recall	49.84(19.58)**	32.07(14.99)**	40.39(19.36)

$p < .05$ *; $p < .001$ **

Table 3.

Study 1: Mean accuracy rate (standard deviation) as a function of interview and modality.

	Cognitive Interview	Structured Interview	Mean
In-person Interview			
Free Recall	.83(.11)	.87(.11)	.85(.11)
Follow-up	.77(.12)	.82(.13)	.80(.13)
Total Recall	.81(.09)	.85(.10)	.83(.10)
Telephone Interview			
Free Recall	.80(.10)	.85(.10)	.83(.10)
Follow-up	.78(.15)	.75(.18)	.76(.17)
Total Recall	.79(.11)	.79(.12)	.79(.11)
Mean			
Free Recall	.82(.10)	.86(.11)	.84(.11)
Follow-up	.78(.14)	.78(.16)	.78(.15)
Total Recall	.80(.10)	.82(.11)	.81(.11)

$p < .05$ *; $p < .001$ **

Table 4.

Study 1: Mean number of not scorable units (standard deviation) as a function of interview and modality.

	Cognitive Interview	Structured Interview	Mean
In-person Interview			
Free Recall	4.00(3.40)	1.90(1.09)	2.87(2.63)
Follow-up	5.72(3.23)	4.38(2.18)	5.00(2.76)
Total Recall	9.17(4.81)	6.29(2.65)	7.62(4.02)
Telephone Interview			
Free Recall	3.37(2.09)	2.24(1.79)	2.78(2.00)
Follow-up	5.42(3.06)	4.95(2.50)	5.18(2.75)
Total Recall	8.79(4.22)	7.19(3.56)	7.95(3.95)
Mean			
Free Recall	3.68(2.78)*	2.07(1.47)*	2.82(2.31)
Follow-up	5.57(3.11)	4.67(2.33)	5.09(2.74)
Total Recall	8.97(4.46)*	6.74(3.13)*	7.78(3.95)

$p < .05$ *; $p < .001$ **

Table 5.

Study 1: Mean number of subjective units (standard deviation) as a function of interview and modality.

	Cognitive Interview	Structured Interview	Mean
In-person Interview			
Free Recall	2.11(3.20)	.29(.64)	1.13(2.38)
Follow-up	3.61(3.26)*	.81(1.08)*	2.10(2.71)*
Total Recall	5.72(5.14)*	1.10(1.37)*	3.23(4.28)*
Telephone Interview			
Free Recall	.95(1.51)	.43(.98)	.68(1.27)
Follow-up	.89(1.66)	.67(1.28)	.78(1.46)*
Total Recall	1.84(2.73)	1.10(1.87)	1.45(2.32)*
Mean			
Free Recall	1.51(2.51)*	.36(.82)*	.90(1.90)
Follow-up	2.22(2.71)**	.74(1.17)**	1.43(2.26)
Total Recall	3.73(4.48)**	1.10(1.62)**	2.32(3.52)

$p < .05$ *; $p < .001$ **

Table 6.

Study 1: Mean number of repeated units (standard deviation) as a function of interview and modality.

	Cognitive Interview	Structured Interview	Mean
In-person Interview			
Free Recall	3.06(2.82)*	.38(.67)*	1.62(2.37)
Follow-up	3.33(2.45)*	1.14(1.59)*	2.15(2.29)
Total Recall	6.39(3.96)**	1.52(1.78)**	3.78(3.84)
Telephone Interview			
Free Recall	1.63(1.26)	1.23(1.48)	1.43(1.38)
Follow-up	1.68(2.16)	2.43(2.31)	2.08(2.25)
Total Recall	3.32(2.89)	3.67(3.02)	3.50(2.93)
Mean			
Free Recall	2.32(2.25)**	.81(1.21)**	1.52(1.92)
Follow-up	2.49(2.42)	1.79(2.07)	2.11(2.25)
Total Recall	4.81(3.74)**	2.60(2.68)**	3.63(3.39)

$p < .05$ *; $p < .001$ **

Table 7.

Study 2: Mean Likert scale response as a function of Interview and Modality.

Question	Mean (*SD)*	*F*	*p*
How credible do you find the witness?	4.69(2.16)	.06	.81
How valuable was the information shared by the witness?	5.76(2.34)	.09	.76
How motivated was the witness to provide complete information?	5.28(2.34)	.27	.60
How helpful did you find this witness?	5.22(2.29)	.02	.89
How trustworthy was the witness?	4.57(1.99)	.10	.73
Do you think you have enough information for police to stop the upcoming crime?	4.68(2.11)	.14	.71
Do you think you enough information to convict the suspects?	3.67(2.16)	.19	.66
Do you think the interviewer did an effective job conducting the interview?	5.65(2.30)	.89	.35
How useful were the questions asked by the interviewer to the witness?	5.90(2.24)	.92	.34
How much could the interview between the interviewer and witness be improved?	6.49(2.13)	.01	.93

APPENDICES

Appendix A

Conversations 1, 2, & 3

General outline

The main conversant will start off talking to someone in person and then will move to talk with someone over the phone, only allowing us to hear half the conversation and then they go meet up with the person they talked to on the phone.

Conversation Steal the tests
Conversation 1:
Richard: Sorry, I am running late, there was some traffic due to an accident on the Palmetto.

Sam: Take a seat, take a seat we need to talk... Take your helmet off the table, its all wet. I don't know how you can drive that thing with the way people drive down here… Anyways, did you see that article in the Herald?

Richard: No, which article?

Sam: The one from this morning. A group of students were expelled for stealing history test answers at NOVA!

Richard: No, I hadn't heard anything, (**in a hushed tone?**) when did that happen? How did they get caught?

Sam: It happened last Wednesday morning. Apparently someone ratted them out and provided a dean with a whatsapp exchange about the plans to get the history test answers. Then they got caught making copies of the answers on the second floor of the library by the copy machines…..Word is that everyone on the group chat will be punished even if they were not there making the copies. I think the article said that they were all seniors who were trying to sell the tests to freshman in their fraternity.

Richard: Oh man..probably they are all being considered as accomplices or at the very least they would be compliant in the breach of the cheating policy because they were all on the chain that helped plan to steal the answers but did nothing to stop it from happening.

Sam: Wow, someone has really been studying for the BAR. I didn't realize the administration in the history department would take this so seriously. It must be the new the new dean Dr. Roberts cracking down on the academic dishonesty policy.

Richard: Yeah, the students will most likely all get suspended. We really need to be more careful with our own operation. I can't afford to be expelled right now with one semester to go.

Sam: If you are so worried we can always find someone else to make all the exchanges. I am sure a lot of guys wouldn't mind making some extra cash.

Richard: No, no! I can do it. This money helps me pay for school. I am just saying we need to make sure we are being careful.

John wasn't caught, right, at NOVA? I was just talking to him the other day about his side gig there.

Sam: No I don't think they caught him, or at least not from what I have heard. He was supposed to be getting those biology exams for Mr. Rodriguez at the time that those NOVA guys got caught. Mr. Rodriguez wants the entire semester's worth of exams and quizzes up front instead of doing them once a month.

Maybe John wasn't on that specific group chat? But if one of his guys rats him out that could be a big problem for him and for you. If he gets caught he won't be able to get the biology exams and it took Mr. Rodriguez years to be able to get that connection inside that department.

Richard: Yeah, yeah. John was just complaining about them using that stupid group chat when I talked to him last week. I wonder if he suspected that someone would use that chat against them..? Maybe that's why he wasn't on it..? I am supposed to hear from him Sunday so I'll see what I can find out about who was caught and when Mr. Rodriguez's job will be done.

Sam: John is your guy that you vouched for so I need you to track him down and find out if he will be able to finish that biology job. I need those materials by Monday at 1:15 because Timmy gets out of school at 3 and Mr. Rodriguez will want them before he has to pick him up. You have 4 days. I wouldn't wait until Sunday.

Richard: I'll get right on it and let you know what I find. You know Mr. Rodriguez keeps everything on a need to know basis and apparently I do not need to know. John may be my guy but the boss doesn't fill me in on what he's up too. John won't let you down though, we have known each other since basic training and if he said he would get you the materials, then I'm sure he will get them.

Sam: You better hope so. Keep me updated. I'll talk to you later

Richard: Will do.

*Conversation 2**: *****phone rings*

Richard: Hello?.....John! What number are you calling from? I was just talking about you with Sam. Are you ok, I heard what happened at NOVA? Were you able to get the….**trails off because John must be talking*** uh huh...uh huh… ok...
(pause between paragraphs as if listening)
Richard: Yeah, Yeah I heard. Sam was telling me that someone snitched on your NOVA connections. Were you in that group chat?

Richard: Good, good. That was smart of you to use a disposable phone. Do you think those other guys will say anything about you being involved?

Richard: Ok, and you're sure none of them knew your real name?

Richard: Well for your sake I hope you're right. We both want to finish our degrees and as graduate students we would definitely get expelled. I for sure would not be able to practice law, ever. I can see the headline now.."Law and Grad student caught up in a school wide cheating scandal"

Anyways, we will be smarter than those whatsapp guys. Were you able to get the biology exams?

Richard: Ok, good. Where can we meet? Sam says Mr. Rodriguez needs everything by 1:15 on Monday?

Richard: Ok, hold on let me open my maps, I am putting you on speaker.

Richard: Ok, it looks like there are two of those parking garages popping up. Is it the one by the library or the post office? What's the exact address?

John: by the library, I will drop a pin for you

Richard: Looks like it will take me about 45 minutes to get over there. So just meet in the parking garage? Which floor?

John: 3rd floor. Can you pick up the first half today? I have the quizzes and activities already downloaded to the flashdrive. I just need a few more days to get access to the exams while the faculty aren't there this weekend. The first file took almost half an hour to download and I didn't want to get caught by sticking around for the other half. But I will still be able to make Mr. Rodriguez's deadline.

Richard: Ok, yeah I can be there around 4pm today and then we can meet up later for the second half of the materials.
John: Ok sounds good. I will see you 4pm.

Conversation 3
in person meeting between John and Richard*

Richard: Hey, John!

John: Hey Richard! Glad to see you found the place ok.

Richard: Yeah, it wasn't too bad. This garage is really in the middle of this campus though. I must have went into the wrong one the first time. When I didn't see you I checked the pin again and realized that I must have gone into the blue garage and not the gold one.

John: Yeah, I try to always move my meeting spot but this campus can be a little confusing.

Richard: Yeah, agreed, I prefer the UM campus. So do you have the flashdrive?

John: Yeah, here it is, Mr. Rodriguez can find the first half of the semester's assignments and quizzes in the folder called "vacation ideas"

Richard: Ok, awesome I know Mr. Rodriguez has really been wanting this material for a while now. I guess he never had someone on the inside of the biology department before.

John: Yeah, I am surprised Mr. Rodriguez couldn't find someone else before me, considering what he is paying. But I am definitely not complaining.

Richard: He's not a very trusting man, so I assume he just never asked around to people he did not know if they would be able to access course materials.

John: Well, I am happy for the extra income, the extra 500 a month really helps me to pay my rent. Otherwise I am not sure how I would get by...the biology department barely pays me anything. But after the drop on Monday I will probably be lying low since NOVA is starting an investigation into the cheating on the history exams and I am worried that they make the connection to the cheating here. I just want to stay as far away from that as possible.

Richard: I will let Sam know when I drop off the flash drive to her Monday to tell Mr.

Rodriguez you will be lying low. Hopefully Mr. Rodriguez is as understanding as you think….being just a middle man I don't really have a good read on him.

John: Ok, thanks. Let's plan to meet again on Monday morning. The students will be back on campus but it won't be suspicious if I am just giving you a flashdrive.

Richard: Ok, should I meet you here again?

John: No, let's meet in the Starbucks in the bottom of the library at 8:30am. That should give you time to get back to the boss before 1:15.

Richard: Ok sounds good I will see you then to collect the rest of the materials. If I see Sam between now and then I will mention how you want to lay low for a few weeks.

John: Ok thanks, see you later.

Conversation 2: Smuggle the drugs

Conversation 1
Jordan: Hey Jaimie, welcome, how are you?

Jaimie: I am doing well, Jordan!

Jordan: I am so excited to be working with you. I've heard lots of great things about you from other celebs; they call you a party planning genius!

Jaimie: *chuckles* I am excited about working with you as well. I love your music! Take a seat; I hope you found my office easily, Downtown Miami can get pretty confusing... especially on a Friday.

Jordan: Yeah, I know what you mean but your company **Party Productions** is pretty easy to spot from miles away, the building is huge! Plus its right by the water so you can't miss it!

Jaimie: That's good to hear. Alright, let's get down to business. What brings you here?

Jordan: Okay so I'm having a really huge birthday party in 2 weeks and I need your help planning everything. I realize it is super short notice but I wasn't sure if I would be in town.

Jaimie: This is definitely doable and I'm ready to help. Tell me what you need. What kind of theme were you hoping for?

Jordan: The party will happen in the evening, maybe starting around 8:30 so I was thinking a space themed party, something out of this world, like me, you know? I'm going to need the basics, a DJ, caterers, a design team, plenty of drinks, and maybe some *"party favors"* if you know what I mean.

Jaimie: Ohhhh of course, what were you thinking?

Jordan: Let's just say it hasn't *snowed* in Miami in a long time.

Jaimie: Perfect, I know just the right guy for the hook-up. He is in Mexico though so it'll take me a couple of days to figure out how to transport the good. It will definitely cost you to get them past the border but my guy is the best around. How much were you thinking?

Jordan: I would actually prefer you to use my personal staff for this. I will give you my assistant Cynthia's contact information. I can not have this getting out to the press and I don't want anyone ruining my party. I have a private jet with a pilot you can use to get the favors direct from your supplier, that way you don't have to worry about customs on your way back from Mexico. As far as quantity, I mean, it is my birthday so I want everyone to have a good time. So just get me about 7 grand worth, and with delivery etc., we can just make it an even 10.

Jaimie: Okay perfect. I can make that happen. The jet will definitely help with transportation. I will talk to my contact and let you know when I will need the plane to pick up the goods.

Jordan: Ok, that would be great. I have the pilot on standby so I will let him know he will be making a trip to Mexico sometime during the week before the party. Once you talk with your contact we'll talk further details... Just make sure to get back to me soon--I don't want to have to worry about this the week of my party since I'm gonna be out of town and I really need you to be on top of this. Don't let me down!

Jaimie: Yeah, of course. You can count on me, it's not the first time I've made this happen for a client. I'll tell my contact over the weekend and set up some of the other stuff you asked for this week. Let's meet up again about this the Sunday before your party/ before you go out of town.

Jordan: ok sounds good. I will see you then and will send you my assistants contact information.

Conversation 2 *****phone dialing*

Jaimie: Hey how are you doing Alex, it's me. How've you been?

Jaimie: Awesome that's great to hear. I'm doing well. Listen I need some snow for this major client and he-- *gets cut off*

Jaimie: Mhm…hmm, okay. Yeah, yeah I hear you. You make a good point. *sighs* Last time was pretty risky but that was only because my assistant was involved and--

Jaimie: Yes yes, I already fired her and she got enough money so she will be keeping quiet. Plus she was heavily involved so she won't say anything, trust me, she won't want to implicate herself. Look, this time it's direct business between me and the client. No other parties involved, last thing any of us need is a scandal right now.

Jaimie: No no, this time the client is a big celebrity, in fact he's this huge singer, you may have seen him at the Grammy's. Anyway, the event will be under strict lockdown. It's an exclusive party with important guests, there will be private security and cell phones won't be allowed in, so we won't need to worry.

Jaimie: No, you won't lose your job with the federal police! This is a perfect opportunity. You don't have anything to worry about this time. It's much less than last time; the client only wants a 7 grand worth, I am sure you have confiscated more than 3 times as much just this past week from border smugglers.

Jaimie: No no, he doesn't know your name nor that you work for the government so relax. You won't have to meet them directly, I will come and get it.

Jaimie: *laughs* Yeah that's right. Been through this hustle together for the last five years. I forgot to tell you the best part --we won't even need the truck guys from last time, this client has their own jet so we don't need to worry about customs.

Jaimie: Exactly...That's what I'm saying, this will be the easiest job! So are you in?

Jaimie: I knew I could count on you cousin! I will need the package between this weekend and next Friday, that is when her party is, so let's figure out when/where to meet so I can let the pilot know.

Jaimie: Uh huh. Sounds good… I'm about to get in my car, let me put you on speaker as I drive.

Jaimie: Okay so the event is in two weeks, how soon do you think you could get the drugs together?

Alex: We just had a big bust two days ago, so I have to wait for all the forensics to be completed. But I can probably have them by Tuesday and meet you during my lunch break.

Jaimie: OK Tuesday works for me. I will let the pilot know that we will be leaving and returning from Mexico on Tuesday.

Alex: Sounds good to me! Let's meet at a cafe. There is this place about a block or two away from the police station called Pane en Via Centro.

Jaimie: Alright I will meet you there. Pane en Via Centro, right?

Alex: Ya that's right--two blocks down from the station.

Jaimie: Ok, I'll be in touch to confirm. Let me know if any complications arise.

Alex: Okay, I'll see you soon cousin.

Jaimie: Alright, I'll schedule the jet now.

Conversation 3: celeb's assistant and Party Planner

Jaimie: Hi, Cynthia, This is Jaimie from Party Productions. I just finished talking to my connection in Mexico, and Jordan told me to speak with you to schedule the pilot..

Cynthia: Ok that shouldn't be a problem. The pilots name is Aaron. When will you need him? He flies out of Miami Executive Airport

Jaimie: I will need him for this upcoming Tuesday.

Cynthia: Ok, I will let him know. He will be waiting for you at Gate B. His departure time will be 6:45 am Tuesday morning and will need to return back by 5pm.

Jaimie: Okay perfect!

Cynthia: Awesome! Oh before I forget...Jordan mentioned that she may need more than she originally intended. She has a friend, Michael, who was hoping to get his own hook-

up with some *extra* party favors to take on the road with him. He is also a musician.

Jaimie: Oh ok, I am sure we could make that work. How much more do they need?

Cynthia: Jordan said just 2 grand worth.

Jaimie: Ok, I can make that happen. Where will Micheal be touring? Will he pick up the package at the party?

Cynthia: Mike is going on a European tour, but before he leaves he will be opening at the American Airlines Arena near Miami Beach.

Jaimie: That is so exciting!

Cynthia: Yeah, he will be leaving soon, so I believe he will just pick it up at the party.

Jaimie: Okay I can make that happen I just need to confirm with my guy that he can get the extra product by that date. But it shouldn't be a problem.

Cynthia: Sounds good! This is gonna be the hottest party of the year with the coolest party favors *laughs* Jordan, always knows how to have fun.

Jaimie: Ok perfect. I will make sure everything is set up. Your pilot has my information so I will be sure to meet him on Tuesday.

Cynthia: Great! Have a good day and let me know if you need anything else.

Jaimie: Will do, thank you.

Conversation 3: Rob the house

Conversation 1

Jenny: Hey Don.

Don: Hey Jen. How are you?

Jenny: I'm good. I saw that one of the water-front properties on south beach got hit hard last Saturday. I was wondering if you knew anything about that? I thought I might have heard Mr. Stevens mention it was you?

Don: Oh yeah, you saw that? I was surprised they advertised that in the news. Yeah that was my crew. Jack got this inside connection that I could not pass up. That woman had more jewels than I have ever seen! It will take me years to properly fence them all.

Jenny: You don't say? What kind of jewelry was it? Was that all you took?

Don: Yeah we took mostly jewelry but also 2 paintings as well. She had this giant walk in closet that had this huge jewelry safe. It was mostly diamonds and gold, but there were also some other precious stones like a sapphire ring and emerald earrings and matching necklace set. It looked like something a Queen would have worn. Weighed a pretty good amount too!

Jenny: Wow, that is a good score! How did you say you managed to pull that off again? I heard on the news that there were no leads yet as to who broke in.

Don: Yeah well, you know me, always careful. I never leave anything behind. Plus it didn't hurt that I had inside information.

Jenny: Oh really? Did you add someone new to your crew?

Don: Not quite. Jack was able to get some inside information from the security company that the owners used. He was able to disarm the alarm for a brief time so I could break in and out without setting it off. Lucky for me his security company also built the old broads safe so I had a copy of a master key. Easiest job I ever completed.

Jenny: That's awesome!

Don: Yeah I am not sure exactly how Jack got the information. I think Mr. Stevens had something to do with it, but it really made the job so much easier.

Jenny: ugh, Mr. Stevens just seems to know all the right people. Any chance you and Jack have another score planned that would need another person? I could really use the extra income.

Don: I will have to think about it. You have only been on a few jobs and this next one might be out of your league, no offense Jack has one more client who recently got this huge safe installed in their home on Key Biscayne. We are not sure exactly what is inside but it has to be something extremely valuable for the size and price of the safe alone. The owners are supposed to go out of town in two weeks, starting on that Friday, so we are trying to figure out if we can plan a way into that safe. Unlike the other one, there is no master key like the last one. I will let you know what I decide once I learn more from Jack.

Jenny: Please do! I may have only done this a few times but I am a natural. When will you be meeting with Jack to figure out the plan?

Don: I am trying to set something up with him later today in the afternoon. This will only work if we can get inside the safe, but we need to find someone who will know how to crack it first. Jack thinks he might know someone.

Jenny: OK, well keep me updated after you talk to him. I could really help. I will do anything, be a lookout, drive the car, you name it! I really want to get on Mr. Stevens good side.

Don: Sounds good, I will keep you updated after I hear from Jack.

Jenny: Great! Bye..

Don: bye..

Conversation 2:

They will start off on the phone then it will switch to just Jenny speaking

Jack: hey Don, how are you

Don: I am doing well. Just driving back after meeting with Jenny. I just wanted to see if you had any updated information on how to crack that safe?

Jack: I am still working on it. But I think my contact believes she can do it. Are you thinking of adding Jenny to the crew?

Don: I'm not sure yet. I have to think about it and see what type of support we will need to get into this safe. Does this contact of yours have a name?

Jack: *chuckles* Yes, she has a name. Her name is Sarah.

Don: Great, so when can we meet with Sarah?.....Oh hold on a sec, I am getting out of my car, I have to disconnect you from the speaker.

Don: Ok, so when can we meet with her?

Don: uh huh, Ok, so Monday at 3pm. Ok Sounds good. Will she know if she can crack the safe by then?

Don: uh huh, hmm Ok good. We do not have a lot of time to plan this and I need to know how many guys I will need. Let me write down the meeting address, hold on I need a pen….

Don: Ok what is it again...ok fourteen fifty-eight Ocean Dr, Miami Beach, perfect.

Don: mmm hmm Yeah, I don't want this to be a big operation. A house like that is bound to have additional security features and the more people the more trouble we could run into. Exactly how long have you known this Sarah?

Don: Ok, I just want to make sure we can trust her. If you say you have known her for a while then I trust you. We have a lot riding on this score.

Don: No Mr. Stevens does not know this is my last heist and I think I want it to stay that way. It is just time that I move on but you know how controlling he can be.

Don: yeah yeah, trust me, after this heist I will be gone for good.

Don: I will see you Monday afternoon, alright?

Don: ok bye

Conversation 3:

Don: Hey Jen

Jenny: Hey Don! I was hoping I would bump into you. Did you get a chance to think about letting me on the crew

Don: Yeah I did actually. I met with Jack and his contact yesterday and it seems they have a good plan on how to open that safe once inside. But we will need 1 more person to stand watch. See, Jacks contact Sarah will show us how to open the safe but she will not actually come on the heist.

Jenny: Oh ok, well I am happy to come! When is this going to go down?

Don: Well the owners should be going out of town starting this upcoming Friday, so I think we will plan it Monday afternoon around 2:30pm. That way most of the neighbors will be out and may not notice us approach the house. We will park a block away just in case.

Jenny: Ok, I am assuming there is a dry run scheduled this week. What do I need to bring?

Don: Since this will happen during the day just dress in regular clothes. You won't need to bring anything to the dry run but we will go over the security cameras and how to take them down and how to open the safe. Jack and I will handle most of that but we want you learn just in case.

Jenny: Oh man! I will definitely be there. I really appreciate you letting me help out with this. Do you have any guesses about what could be in that safe?

Don: We aren't sure but the husband is an avid art collector so we are guessing it might be some very expensive smaller pieces? But it really could be anything.

Jenny: Ok, so when should I meet you for the dry run?

Don: We will meet Thursday-Sunday to go over the plan and practice our roles. Probably start around 11am each day. We will meet at Jacks.

Jenny: Ok sounds good, I know where that is. I will see you on Thursday then!

Don: See you then Jen.

Appendix B

Structured Interview

Step 1: Greet the witness, ask them about their day to build rapport/ where they live, classes they take, if they work etc. Explain the instructions and purpose of the interview "You understand that they are an informant who has overheard an important conversation. It will be your job (the interviewer) to listen to what they have to say." Mention that their interview will be recorded. Instruct the witness not to guess.

Step 2: Open-ended question: "Please tell me everything you remember overhearing". (Do not interrupt the witness)

Step 3: You can now ask up to 5 additional open-ended follow-up questions relating to either times, locations, names, or events that were mentioned. Ex., You mentioned a guy named John, can you tell me more about him and what he had to say?" "You did not mention any names, did you happen to overhear anyone being called by their name?"

Step 4: "Is there anything else you can remember about the conversation, any additional information?"

Step 5: If no additional information was provided then the interview is now over and you should thank the witness for their time and cooperation. Interviews will end after a participant says the words "that's it/ that is all I can remember".

If the witness provided additional information in step 4, then repeat step 4 again asking if there is any more additional information they can remember. If not then move to step 5 and tell them the interview has concluded.

Appendix C

Cognitive Interview

Step 1: Build rapport with participant

Step 2: Explain why participation is so important. "You were the one who overheard everything not me, therefore you will be doing most of the talking and I will just be listening. This will not be like a normal conversation because there will not be a lot of eye contact and like I just mentioned you will be doing most of the talking. Think of me as your secretary and you are the boss. As you talk I may take notes but I am always listening. It is important for you to provide me with as much detail as possible even if you think it is irrelevant."

Step 3: Model statement. "I want you to provide as much detail as possible, in fact let me give you an example of the level of detail I am looking for"…"If your report is as detailed as mine then it will probably take you about 20 minutes to tell me everything you overheard".

Step 4: Context reinstatement and open-ended question. "I now want you to think back to the conversation. Close your eyes and think about the room you were in, think about what you were feeling and the voices you heard. Take a minute to get a really good image in your mind. Then when you are ready I want you to start telling me everything you remember overhearing".

Step 5: Semi-cued follow up questions pertaining to upcoming event, names, dates, times, and locations. "Think back to when there was a change in the conversation" "Who seemed to be in charge, how did you know?/ what did they say?" etc.

Step 6: Closing question. "Is there anything else you remember overhearing?"

Appendix D

Motivational Questionnaire and Demographics

Sex

Male (1)

Female (2)

I prefer not to disclose (3)

Age (just type in the number ex. 25; Not 25 years)

_____

Ethnicity

Caucasian (1)

Black (2)

Hispanic (3)

Latino/a (4)

Asian (5)

Pacific Islander (6)

other (7) _____

I prefer not to disclose (8)

Year in school

Freshman (1)

Sophomore (2)

Junior (3)

Senior (4)

Grad student (5)

Other (6) _____

What is your current GPA?

3.5-4.0 GPA (1)

3.0-3.49 GPA (2)

2.5-2.99 GPA (3)

2.0-2.49 GPA (4)

1.5-1.99 GPA (5)

1.0-1.49 GPA (6)

Less than 1.0 (7)

Did you remember overhearing the conversation 2 days ago?

Yes (1)

No (2)

How much of the conversation do you think you remembered?

	0 1 2 3 4 5 6 7
0 = none of the conversation; 7 = all of the conversation ()	

How easy was it to understand the conversation you overheard 2 days ago?

	0 1 2 3 4 5 6 7
0 = not at all easy; 7 = completely easy ()	

How motivated were you to listen to the conversation 2 days ago?

	0 1 2 3 4 5 6 7
0 = not at all motivated; 7 = completely motivated ()	

How motivated were you to remember the conversation after leaving the lab?

0 1 2 3 4 5 6 7

0 = not at all motivated; 7 = completely motivated ()	

Did you write down anything you heard from the conversation or record any parts of the conversation? If yes, please elaborate below.

Yes (4) _____

No (5)

How believable was the conversation you overheard?

0 1 2 3 4 5 6 7

0 = not at all believable; 7 = completely believable ()	

How easy was it to understand the instructions given to you by your original mission coordinator (person you met with before hearing the conversation)?

0 1 2 3 4 5 6 7

0 = not at all easy; 7 = completely easy ()	

How competent did you find your original mission coordinator?

0 1 2 3 4 5 6 7

0 = not at all competent; 7 = very much competent ()	

How realistic was your interview today with the "detective"?

0 1 2 3 4 5 6 7

0 = not at all realistic; 7 = completely realistic ()	

How much did you like your interviewer?

0 1 2 3 4 5 6 7

0 = not at all; 7 = very much ()	

How competent did you find your interviewer?

0 1 2 3 4 5 6 7

0 = not at all competent; 7 = very much competent ()	

Do you believe your interviewer was listening to you?

0 1 2 3 4 5 6 7

0 = not at all; 7 = very much ()	

How believable was it that you were undercover?

0 1 2 3 4 5 6 7

0 = not at all believable;71 = completely believable ()	

Did you think about the conversation in your head at all after hearing it for the first time?

No (1)

Yes; once (2)

Yes; 2-3 times (3)

Yes; 4-5 times (4)

Yes, more than 5 times (5)

Did you recognize any of the voices in the conversation you overheard? If yes, who did you recognize.

Yes (4) _____

No (5)

Did you have any prior knowledge about the study before you signed up, other than what SONA tells you? If yes, please explain. An example could be a friend participated and then told you about what would happen.

Yes (1) _____

No (2)

Have you ever been interviewed by a detective or police officer before?

Yes, as a witness/ victim (4)

Yes, as a suspect (5)

No (6)

Thank you for participating in this study!

It is important for the studies design that you do not talk to other students about what happened during your participation. We appreciate your discretion.

Appendix E

Analyst Questionnaire

Conversation 1 Analyst Questionnaire

What is the upcoming crime that the investigator and witness are discussing?

- ○ write your answer here

_____

- ○ answer not stated

Please list the names of all the people who were mentioned in the transcript. If a specific name is not mentioned you can list a brief description of that person (i.e., The man selling donuts).

- ○ write your answer here

_____

- ○ answer not stated

Please list the names of all the people who will be at the future criminal event. Note these questions will overlap with what you put for question 2.

- ○ write your answer here

_____

- ○ answer not stated

On what day of the week will the future criminal event occur?

- ○ write your answer here

_____

- ○ answer not stated

At what time will the upcoming criminal event occur?

- ○ write your answer here

_____

- ○ answer not stated

At what location will the upcoming criminal event occur?

- ○ write your answer here

_____

- ○ answer not stated

What type of exams--which course subject(s)--were previously stolen?

- ○ write your answer here

_____

- ○ answer not stated

At which school did students get caught stealing exams from previously?

- ○ write your answer here

_____

- ○ answer not stated

From which school are exams currently being stolen?

- ○ write your answer here

_____

- ○ answer not stated

What is the occupation of the person who steals the tests?

- write your answer here

_____

- answer not stated

What is the occupation of the person who picks up the tests from the person who stole them?

- write your answer here

_____

- answer not stated

How did the two people exchanging the exams originally meet?

- write your answer here

_____

- answer not stated

At the previous school, how were the students who were in charge of the cheating caught?

- write your answer here

_____

- answer not stated

How is the person stealing exams able to get access to them?

- write your answer here

_____

- answer not stated

Who is in charge of the cheating ring?

- write your answer here

_____

- answer not stated

How are the exams being handed off?

- write your answer here

_____

- answer not stated

What color is the car that the person in charge drives?

- write your answer here

_____

- answer not stated

Where did the two people meet to exchange the first half of the exams?

- write your answer here

_____

- answer not stated

How much money is the person stealing exams making for his participation?

- write your answer here
_____
- answer not stated

Conversation 2 Analyst Questionnaire

What is the upcoming crime that the investigator and witness are discussing?

- ○ write your answer here

_____

- ○ answer not stated

Please list the names of all the people who were mentioned in the transcript. If a specific name is not mentioned you can list a brief description of that person (i.e., The man selling donuts).

- ○ write your answer here

_____

- ○ answer not stated

Please list the names of all the people who will be at the future criminal event. Note these questions will overlap with what you put for question 2.

- ○ write your answer here

_____

- ○ answer not stated

On what day of the week will the future criminal event occur?

- ○ write your answer here

_____

- ○ answer not stated

At what time will the upcoming criminal event occur?

- write your answer here

_____

- answer not stated

At what location will the upcoming criminal event occur?

- write your answer here

_____

- answer not stated

What is the profession of the person trying to plan a party?

- write your answer here

_____

- answer not stated

What are the names of any companies involved?

- write your answer here

_____

- answer not stated

What is the profession of the person who has the drugs?

- write your answer here

_____

- answer not stated

What kind of drugs are being talked about?

- write your answer here

_____

- answer not stated

Where were the drugs originally located?

- write your answer here

_____

- answer not stated

Money spent on drugs How much money is being exchanged for drugs?

- write your answer here

_____

- answer not stated

How is the person with the drugs able to get them?

- write your answer here

_____

- answer not stated

What type of transportation is being used to travel to acquire the drugs?

- write your answer here

_____

- answer not stated

Where will the party planner meet the transportation to go pick up the drugs?

- write your answer here

_____

- answer not stated

How do the party planner and the person with the drugs know each other?

- write your answer here

_____

- answer not stated

Where is the person buying drugs going on vacation?

- write your answer here

_____

- answer not stated

Who is the other person who wants to buy drugs? (if no name is listed a description is acceptable)

○ write your answer here

_____

○ answer not stated

Where will the party planner meet the person who wants the drugs to hand them off?

○ write your answer here

_____

○ answer not stated

Conversation 3 Analyst Questionnaire

What is the upcoming crime that the investigator and witness are discussing?

○ write your answer here

_____

○ answer not stated

Please list the names of all the people who were mentioned in the transcript. If a specific name is not mentioned you can list a brief description of that person (i.e., The man selling donuts).

- ○ write your answer here

_____

- ○ answer not stated

Please list the names of all the people who will be at the future criminal event. Note these questions will overlap with what you put for question 2.

- ○ write your answer here

_____

- ○ answer not stated

On what day of the week will the future criminal event occur?

- ○ write your answer here

_____

- ○ answer not stated

At what time will the upcoming criminal event occur?

- ○ write your answer here

_____

- ○ answer not stated

At what location will the upcoming criminal event occur?

- write your answer here

_____

- answer not stated

What items were stolen from the house that was previously robbed?

- write your answer here

_____

- answer not stated

Who was involved in the past heist?

- write your answer here

_____

- answer not stated

What do the thieves plan to do with the stolen goods from the previous heist?

- write your answer here

_____

- answer not stated

How did the person who disarmed the security cameras know how to do that?

- write your answer here

_____

- answer not stated

What is the primary motivation of the person who wants to join the next heist?

- write your answer here

_____

- answer not stated

Who seems to have the most connections to criminal activity?

- write your answer here

_____

- answer not stated

What is the name of the person will be robbed?

- write your answer here

_____

- answer not stated

What is the role of the outside person who was called in to help?

- write your answer here

_____

- answer not stated

Where will the two thieves meet with this outside person called in to help?

- write your answer here

_____

- answer not stated

What do the thieves specifically plan on stealing at the next heist?

- write your answer here

_____

- answer not stated

Where do the thieves meet to practice?

- write your answer here

_____

- answer not stated

On what day(s) of the week do the thieves plan to practice?

- write your answer here

_____

- answer not stated

At what time will the thieves all meet to practice?

○ write your answer here

_____

○ answer not stated

Utility Questions for all three conversations

You will now answer questions about <u>your perceptions</u> of the interview you read. The following questions will be asked on a 1-10 scale with 10 being more positive and 1 being more negative.

How credible did you find this witness?

	extremely not credible	2	3	4	5	6	7	8	9	extremely credible

How valuable was the information shared by this witness?

	extremely not valuable	2	3	4	5	6	7	8	9	extremely valuable

How motivated was the witness to provide complete information?

	extremely not motivated	2	3	4	5	6	7	8	9	extremely motivated

How helpful did you find this witness?

	extremely not helpful	2	3	4	5	6	7	8	9	extremely helpful

How trustworthy was the witness?

	extremely not trustworthy	2	3	4	5	6	7	8	9	extremely trustworthy

Do you think you have enough information for police to stop the upcoming crime?

	0% chance of stopping the crime	2	3	4	50% chance of stopping the crime	6	7	8	9	100% of stopping the crime

Do you think you have enough information to convict the suspects?

	0% chance of convicting the suspects	2	3	4	50% chance of convicting the suspects	6	7	8	9	100% of convicting the suspects

Do you think the interviewer did an effective job conducting the interview?

	extremely not good	2	3	4	5	6	7	8	9	extremely good

How useful were the questions asked by the interviewer to the witness?

	extremely not useful	2	3	4	5	6	7	8	9	extremely useful

How much could the interview between the interviewer and witness be improved?

	0%-could not be improved. It was perfect	2	3	4	5	6	7	8	9	100%-everything could be improved

Demographics

What is your sex?

Male

Female

I prefer not to state

What is your current age?

_____

What is your race?

White

Hispanic

Black/ African American

Asian

Native American/ American Indian

Pacific Islander

Other/ Mixed _____

What year are you currently in school?

Freshman

Sophomore

Junior

Senior

Graduate student

What is your primary language?

_____

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PUBLICATIONS AND PRESENTATIONS

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