Effective Police Interviewing

By

Michael Logue, PhD

A thesis

submitted in partial fulfillment

of the requirements for the degree

Doctor of Philosophy

Faculty of Social Sciences

Department of Psychology

BROCK UNIVERSITY

St. Catharines, Ontario

General Abstract

Suspect interviewing is a vital tool for law enforcement agencies. However, a large body of empirical literature has demonstrated that many popular interviewing techniques limit the amount of information gleaned and demonstrate chance levels of deception detection accuracy under strict experimental control. Research highlighting information gathering interviews that induce cognitive load and language-based deception detection techniques have demonstrated promise. The series of studies presented here provide evidence that the application of Reality Monitoring (RM) to statements elicited by a modified version of the Cognitive Interview for Suspects (CIS) provides an effective method of suspect interviewing that improves deception detection accuracy in comparison to levels previously reported in the literature.

Study 1 considers the accuracy of deception detection in statements provided by undergraduate students in a mock theft scenario. Participants were interviewed using a modified version of the CIS. Six RM criteria that had been validated in previous studies were applied to all statements as a measure of deception detection. This study found an overall accuracy rating of 86.6%, supporting the use of this protocol. Study 2 directly compares deception detection accuracy of RM to the subjective judgements of observers. Three hundred and ninety observers judged deceptiveness of 100 CIS interviews previously recorded in Study 1. Collectively the average level of accuracy for observer ratings of the first question of the CIS interviews was 52.73% and only 47.82% at the conclusion of the interview. Observer ratings of deception became significantly less accurate at the conclusion of the interview ($t(389) = 4.75$, $p < .01$). In contrast, the RM scale was highly accurate (92.5 %) in a direct comparison of the same interviews.

Study 3 considers whether certain personality traits, namely psychopathy and social dominance, increase successful deception both in terms of observer ratings and Reality Monitoring. Findings indicate that social dominance was related to increased observer ratings of honesty over time, however socially dominant people were not particularly successful deceivers. Similarly, psychopathic traits were not significantly related to deceptive ability overall. However, Factor 2 psychopathy was linked to being less believable by observers, even when telling the truth. These personality traits were not linked to an increased ability to beat Reality Monitoring, providing further evidence for the use of this scale. Collectively, the series of studies presented provide evidence of the effectiveness of the use of Reality Monitoring on statements derived from the Cognitive Interview for Suspects.

Keywords: Deception Detection; Reality Monitoring; Psychopathy; Dominance; Cognitive Interview for Suspects.

Acknowledgements

First I would like to thank my thesis supervisor, Dr. Angela Book for her assistance and guidance throughout my graduate studies. From taking a chance on a police officer with an interest in research, through to the completion of this project your support has been invaluable. I will be forever grateful for your knowledge, patience and flexibility while I attempted to manage education and employment. I would also like to thank my thesis committee, Dr. Tony Volk and Dr. Carolyn Hafer for their involvement in this project. Your insights were of great assistance from designing the studies to the completion of the final draft.

I would like to thank the members of the Book lab at Brock University. Fellow graduate students Nathalie Gauthier, Ashley Hosker-Field, Narnia Worth and Tabitha Jones were a great support to me throughout my graduate studies. From providing research ideas, insight into psychopathy and free stats tutorials, you have been incredibly helpful in achieving my goals. I was also extremely fortunate to have the assistance of undergraduate students who played a vital role in the research presented in my thesis. Paul Frosina, Tylor Huizinga, Shelby Amos, Mirna Batnic, Skye Hill and Dallas Nagy worked tirelessly in assisting me in completing this research.

I would also like to thank the Hamilton Police Service for their support in my Ph.D. Studies. I am extremely proud to be an active serving police officer for the Hamilton Police Service. While the service has contributed financially to my studies, I am most grateful for the flexibility that was provided to allow me to attend classes. Chief DeCaire and Chief Girt have fostered an environment that values continuing education throughout the organization. The overarching value of continuing education was made

possible by my direct supervisors and fellow officers who granted me the time to complete my project. I would not have been able to attend classes or without the support of my co-workers, who were always there to assist with scheduling to make sure I could get to class between shifts, and even on my lunch break. Special thanks to Sarah Burtenshaw, my expert proofreader, who spent countless hours in a patrol car listening to me recite presentations and talks between calls.

Finally, and most importantly, I would like to thank my family for their support. From my first day of school to today I could not have completed this journey without them. My siblings Veronica and Matthew have been a great support for me, and my parents Mary and Michael have made countless sacrifices so that we can follow our dreams, whatever they may be. Marie Gold, your determination, wisdom and understanding continue to motivate me to be my best in all areas of life, and to live each day to the fullest.

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1.1 Overview

Deception detection is of vital importance to law enforcement professionals. Despite decades of research and numerous deception detection methods being proposed, studies have indicated a chance level of accuracy (Bond & Depaulo, 2006; Hartwig et al., 2004; Kraut, 1980). The goal of my dissertation is to validate an effective system of police interviewing that includes a reliable method of determining statement veracity. This interview must be compatible with a method of deception detection that provides a high level of accuracy regardless of the skill of the interviewer or characteristics of the interviewee. Despite the previous failure to provide an accurate and consistent method of detecting deception in interviews, the research literature has provided some avenues of success. First, language based deception detection techniques such as Reality Monitoring are more effective and reliable than nonverbal/body language techniques (Bond & Depaulo, 2006; Masip, Sporer, Garrido, & Herrero, 2005; Vrij, 2005). Further, actively inducing cognitive load through interviewing techniques has demonstrated increased deception detection accuracy (Vrij et al., 2008; Vrij, Mann, Leal, & Fisher, 2010). My dissertation demonstrates the effectiveness of a modified version of the Cognitive Interview for Suspects (CIS) as a method of interviewing that increases the amount of information provided throughout an interview, and improves the sensitivity of the Reality Monitoring (RM) scale. The series of studies presented provide evidence that Reality Monitoring is more accurate than subjective observer ratings, and it is not affected by personality traits that have been linked to an increased ability to deceive others.

1.2 Empirical Studies of Deception Detection Accuracy

Volumes of empirical literature have been conducted in the field of deception detection. The vast majority of these studies may be broadly defined as "field" or laboratory studies. Field studies generally involve having an observer rate deceptiveness of an individual after watching a video of a real life scenario such as a police interview of a suspect who has been accused of a crime. For example, Whelan, Wagstaff, and Wheatcroft (2015) analyzed deceptive cues of real life video clips of people who were pleading for assistance in locating their missing family members, when some of these individuals were later found guilty of having involvement in their family member's disappearance. Mann, Vrij, and Bull (2002) examined interviews of 16 suspects of various criminal activities ranging from simple theft to homicide. While many field studies involve interviews or transcripts of suspects, certain studies have examined the veracity of witness statements provided by victims (Esplin et al., 1998; Lamb et al., 1997).

Although field studies may provide more initial appeal, as they demonstrate real behaviours under pressure in high stakes scenarios, it is often difficult to establish the "ground truth." Put simply, in order to establish deception detection accuracy, the researcher must be able to conclusively determine whether the story presented is true or false. Most researchers resort to corroborating evidence such as DNA or witness statements to determine whether the story is true or false as a measure of ground truth (Vrij, Mann, & Leal, 2013). Unfortunately, in many cases, such as historical child abuse, corroborating evidence is difficult to find. Further, while corroborating evidence may allow one to determine the overall accuracy of the statement, a deceptive individual may

use portions of the truth to construct a story. Therefore researchers using field studies are often unable to conclusively determine whether an individual is telling the complete truth or a full lie.

Laboratory studies are often used in the field of deception detection. These methods typically involve randomly assigning participants to a truthful or deceptive condition. The manipulation can be as simple as directing participants to tell a true or false story about their pasts (Geiselmann, 2012). Studies have attempted to increase the immediacy of these scenarios by directing participants to tell the truth or lie about a film they just watched or whether they are currently concealing an item on their person (Vrij, Akyehurst, & Morris, 1997; Vrij et al., 2001). Although laboratory studies allow for random assignment and increased control, these methods have drawn criticism for their lack of realism. Specifically, these "low stakes" manipulations may not motivate the participant to lie or elicit the cues to deception that may be observed in real life scenarios.

More recent research has attempted to increase ecological validity by creating experimental scenarios where the participant either experiences or is directed to lie about participating in an event. Examples of this paradigm include having participants commit a mock crime and being directed to lie about eating at a restaurant (Vrij et al., 2009). Alternatively, participants have been directed to deliver a package to a "secret location" on campus, with deceptive individuals being directed to lie about the details of the event (Vrij, Leal, Mann, & Granhag, 2011). Perhaps the most popular variation of this method has been utilized by Vrij and colleagues in a series of studies (Vrij et al., 2008, Vrij, Mann, Leal, & Fisher, 2010). Participants are randomly assigned to a truthful or deceptive version of a game scenario. In the truth condition, individuals participate in a

game with a confederate, during which money is reported to be missing from a wallet that is left in the room. In the deception condition, participants are brought into the room and directed to take money out of the wallet by researchers. They are then provided a template of the truthful scenario to create a believable lie. Both sets of participants are then interviewed, with the goal of convincing an interviewer that they did not take the money. Many of these studies provide financial incentives as a motivation to increase the stakes of deception. Collectively, more modern approaches provide a more effective balance of control and realism as they provide both an empirical manipulation of deception and somewhat increased stakes for failure.

1.2.1 Previously Reported Levels of Deception Detection Accuracy

Unfortunately, regardless of experimental method or manipulation employed in studies, volumes of research have indicated that deception detection accuracy hovers around chance. In a meta-analysis, Bond and Depaulo (2006) observed a 54% overall deception detection accuracy. Interestingly, despite training and experience in detecting deception, police officers do not perform appreciably better than lay individuals in controlled laboratory settings. Kraut and Poe (1980) found that lay persons and customs officers could not detect deception when watching interviews of people who were suspected of smuggling contraband. Experience has not been found to increase accuracy, as veteran officers do not perform better than new recruits when judging deceptiveness in audio interviews (Depaulo & Pfeiffer, 1986; Kohnken, 1987). In perhaps the most ambitious study of deception detection, Ekman and O'Sullivan (1991) assessed over 500 participants from a variety of fields including: polygraph technicians, state police officers, judges, lawyers, accountants, psychiatrists, and college students on their ability

to detect lies in 10 video statements. In this study, only secret service agents performed better than chance (64%). Vrij & Mann (2001) noted a slight increase in detection accuracy compared to baseline rates when officers viewed suspect interrogations (64%). However, results appeared to be influenced by context, as the same officers could not detect deception when watching videos of people who were asking for help finding family members whom they had actually murdered. Researchers have argued that passively watching videos does not capture the experience of an investigator who can ask pertinent questions and interact with the suspect during actual police interviews. Hartwig et al. (2004) investigated this concern, performing their study on experienced officers who actually interviewed the "suspect" university students who were potentially involved in a mock "drug deal." Consistent with previous findings, this study noted that officers who are actually interrogating suspects do not perform better than chance levels, even when given free rein to control the interview process.

1.2.2 Signal Detection Theory

Signal Detection Theory (Green & Swets, 1966) is an important consideration when determining the accuracy of a deception detection method. This theory argues that overall accuracy must include not only the amount of times a deceptive statement is classified as deceptive, but also the proportion of correct to incorrect classifications. In deception detection studies, a "Hit" occurs when a deceptive statement is correctly classified as deceptive. A "Miss" occurs when a deceptive statement is miscategorised as truthful. A "False Alarm" occurs when a truthful statement is classified as deceptive, and a "True Negative" occurs when a true statement is correctly determined to be truthful (Burgoon, 2015). The goal of any deception detection method is to correctly detect

deception when present (sensitivity), and to classify non-deceptive statements as truthful (specificity). In fact, while Bond and Depaulo's (2006) meta-analysis revealed a 54% overall accuracy rating, it found that people were more accurate at classifying truthful statements (61%) but performed at below chance levels when detecting deception (47%). This finding has lead researchers to argue the already low levels of deception detection accuracy are inflated by a "truth bias" (Levine, Park, & McCormack, 1999).

Unfortunately, in many instances of Signal Detection Theory, increasing the amount of "Hits" often is accompanied by an increase in "False Alarms". Considering the stakes of real world police investigations, a deception detection method must correctly classify both truth and lies. An increase in "False Alarms" would mean that truthful people would be deemed to be deceptive by police, potentially leading to a variety of negative consequences. Therefore my thesis will consider both sensitivity and specificity of Reality Monitoring in determining deception detection accuracy. The goal of my research is to develop a deception detection method that increases the amount correctly classified deceptive accounts, without a corresponding increase in misclassifying truthful people as deceptive.

1.3 Nonverbal Methods of Deception Detection

Collectively, the research literature has indicated that regardless of experimental manipulation, training or practical experience of the judge, deception detection rates hover around chance levels of accuracy. The vast majority of deception detection research involves observer ratings of deceptiveness. Perhaps the poor performance

observed may be explained by reliance on nonverbal, particularly body language, cues. Many theories of deception detection rely on the belief that lying is a cognitively and emotionally taxing practice that creates observable physiological responses in the body of the deceiver (Buller & Burgoon, 1996; Zuckerman et al., 1981). This long standing historical and cross cultural belief has led to numerous nonverbal methods of deception detection. For example, an ancient Chinese deception detection method centers on the belief that lying decreases salivation. This method called for a person to chew on rice powder during interrogation. If the person did not salivate during this process, he or she was deemed to be deceptive (Kleinmuntz & Szucko, 1984).

Perhaps the most common and popular method of nonverbal deception detection involves the interpretation of body language cues. There is a pervasive belief that cues such as gaze aversion, rapid speech, and hand/foot movements are indicative of deception. Numerous studies have indicated that both lay persons and professionals often rely on body language cues to deception. The Global Deception Team (2006) investigated stereotypical beliefs regarding non-verbal cues to deception in 58 countries. This study provided a list of 103 body language cues and gestures that the general population believes are indicative of deception cross culturally. These beliefs are represented in law enforcement training. Police officers are often trained to search for body language cues to deception. In a review of 18 policing manuals, King and Dunn (2010) noted that many indicated that nonverbal cues such as gaze aversion and fidgeting indicated deception. Further, the “Reid Technique” a highly popular and influential, yet controversial, model of police interviewing centers on the use of nonverbal cues to deception. Inbau, Reid, Buckley, and Jayne (2001) propose an extensive list of

"deceptive behaviours" including gaze aversion, grooming, postural, shifts and covering the eyes/mouth with one's hands.

Despite the prevalence of nonverbal cues in deception detection settings, the research literature has indicated that they are largely ineffective. In a meta-analysis of 120 studies involving 158 body language cues, Depaulo et al. (2003) indicated that there is no universal body language cue that indicates deception. The vast majority of cues reviewed were found to be inconsistent and unrelated to deception. While some evidence has been provided that certain cues such as pitch, and hand and foot movements have been linked to deception, these cues are dramatically affected by context such as effort, rehearsal time, and potential consequences (Stromall, Hartwig, & Granhag, 2006). Further, Vrij, Mann, and Leal (2013) argue that studies that have reported significance have demonstrated such small effect sizes (Cohen's D = 0.1-0.3) that these effects would be virtually imperceptible to the naked eye.

1.4 Verbal Methods of Deception Detection

Collectively, the research literature has indicated that subjective observer ratings that rely on body language cues are not reliable measures of deception detection. An interesting finding in Depaulo et al.'s (2003) meta-analysis of deception detection research was that verbal cues to deception were more reliable than non-verbal cues. Further, a direct comparison of verbal versus nonverbal cues to deception demonstrated that language-based methods of deception detection may be more accurate. Bond and Depaulo's (2006) meta-analysis compared studies that involved 1.) Watching recordings

with sound 2.) Listening only to audio recordings 3.) Reading transcripts of statements, and 4.) Watching video clips without sound. This analysis demonstrated that watching videos without sound and therefore only relying on body language cues led to significantly worse deception detection accuracy than the other conditions. These results highlight the possibility that language-based cues are more effective than non-verbal cues.

1.4.1 Criteria-Based Content Analysis

There are two major competing models of verbal deception detection that are under examination in the empirical literature: Criteria-Based Content Analysis (CBCA) and Reality Monitoring (RM). The CBCA method was developed in 1950's Germany to assist clinicians and social workers to assess the veracity of children's allegations of sexual abuse. Raskin and Esplin (1991) developed a scale of 19 criteria that have been used to assess the accuracy of statements. This scale is applied to an uninterrupted free narrative of the event to determine a validity score. The effectiveness of the CBCA has been assessed in a variety of field studies and controlled laboratory experiments. Field studies typically involve applying the CBCA to children's witness statements in actual sexual abuse matters that have appeared before the court. True accounts are determined by corroborating evidence, or perpetrator confession. Statements are classified as false if the witness recants the statement or if the perpetrator is found to be not guilty. Esplin et al. (1988) found that CBCA was successful in determining the truthfulness of 70% witness statements of sexual abuse provided by children age three to fifteen. Lamb et al. (1997) assessed 98 statements of 4-12 year olds on 14 of the CBCA criteria and found that the CBCA significantly discriminated between true and false statements. However

the effects in this study were small, as true statements contained 6.74 CBCA criteria as compared to 4.85 in false statements. Craig et al. (1999) found similar results in sexual abuse statements of 3-16 year olds, noting that true statements contained an average of 7.2 of 14 CBCA criteria as compared to 5.7 in false statements.

Laboratory studies of the CBCA have been conducted by having participants tell one truthful and one fabricated story for researchers to apply the CBCA to determine accuracy. Indeed studies have shown that the CBCA can discriminate between true and false stories above chance levels over a variety of participant ages and statement topics. Yuille (1988) had young children age 5-10 provide statements about a topic of their choice after a 2 day rehearsal period. Researchers trained in CBCA correctly classified true stories (91%) and false stories (74%). Steller, Wellershaus, and Wolf (1988) found the CBCA to be effective in assessing truth (74%) or lies (62%) in children's stories of a medically invasive procedure such as having blood taken or dental work. Similar results have been found when assessing the veracity of adult statements. Hofer et al. (1995) found that the CBCA was able to discriminate between recollections of a video of a robbery, or a story that was fabricated from a predetermined order of events. Ruby and Brigham (1997) noted that the CBCA was able to correctly classify true stories of adults (89%); however this tool was unable to determine whether a participant was lying (8%).

Although the body of literature on the CBCA has highlighted the importance of verbal cues to deception detection, there are caveats to this method. Currently there is no agreement on which of the 19 criteria are important for deception detection. Empirical studies have often only tested certain subsets of criteria, and each study differs in terms of which criteria are proven to be significant. In a meta-analysis of all 37 CBCA studies

determined to meet empirical standards, Vrij (2005) reported that on average, CBCA can successfully detect true accounts in 73% of cases and false accounts in 72% of cases. While CBCA vastly outperforms nonverbal deception detection techniques, Vrij (2005) argues that this accuracy rate does not meet the threshold of "beyond a reasonable doubt" and therefore, CBCA should not be admitted as scientific evidence in criminal court.

1.4.2 Reality Monitoring

In addition to the aforementioned caveats of the CBCA, psychologists have expressed concern that this scale has been adapted from clinical experience. Thus researchers have proposed a competing model, Reality Monitoring, which was developed through the application of scientific principles discovered through the study of human cognition. Johnson and Raye (1981) originally proposed that truly experienced events will be encoded differently in the brain than fabricated creations. Specifically, true accounts will contain more sensory, contextual, affective, and cognitive information than false accounts. Later researchers have used this theory to create a Reality Monitoring scale to assess true and false statements using verbal cues. This method applies 8 criteria: vividness, sensory information, spatial information, temporal information, coherence, emotion, realism, and cognitive operations (Masip, Sporer, Garrido, & Herrero, 2005).

Empirical research has shown that Reality Monitoring successfully discriminates between true and false statements above chance levels. In a study of personally experienced or fabricated stories told at the time and after a one-week delay, Reality Monitoring was effective in correctly classifying true (68%) and false (70%) stories (Sporer & Kupper, 1995). Additionally, Sporer and Hamilton (1996) noted that Reality

Monitoring was capable of discriminating between true and false stories of adults pertaining to childhood experiences (Masip et al, 2005). Similarly, Vrij et al. (2000) conducted a study on stories provided by nurses who watched a video of a theft of a patient's wallet. Reality Monitoring correctly classified 70.6% of true cases and 64% of false cases. Interestingly, 60% of the truthful participants reached the maximum possible Reality Monitoring score, as compared to only 12% of the deceptive statements. Meta-analysis of this method demonstrates a similar accuracy rating of true (71.7%) and false (66.10%) accounts. However, similar to the CBCA, empirical research on Reality Monitoring has often only used subsets of the 8 criteria, and there is not universal agreement on which criteria are important for deception detection (Masip et al., 2005).

Recently, Vrij and colleagues have successfully used a set of six specific Reality Monitoring criteria: visual, audio, spatial, temporal, cognitive, and affective details reported. These criteria have the advantage of being concrete and simple to score, with little room for interpretation. This 6-item scale has been demonstrated to detect deception above chance levels of accuracy in a variety of controlled laboratory studies. However, it should be noted that the effect sizes, while above chance, remain at about the same relative level found in other using differing subsets of Reality Monitoring criteria (Vrij et al., 2008; Vrij, Mann, Leal, & Fisher, 2010). Direct comparisons of the CBCA and Reality Monitoring have revealed conflicting results. Both methods have been applied to the same stories in eight studies, with Reality Monitoring outperforming the CBCA in five of these comparisons. Additionally, the overall average accuracy rating was slightly higher when statements were scored using RM (68.13%) as compared to CBCA (63.63%) (Masip et al., 2005).

In summary, both CBCA and Reality Monitoring consistently perform better than behavioural cues at assessing deceit, highlighting the importance of verbal methods of deception detection. However, the research on these methods does not allow for conclusions regarding which criteria are effective, and their current accuracy scores do not meet the legal standard of "beyond a reasonable doubt". One weakness of both of these approaches is that they are post-hoc scale measures that are applied to uninterrupted witness statements. This approach suffers both from being limited by the quality of the witness statement and a lack of ecological validity, as police officers apply numerous techniques to elicit information from victims, witnesses and suspects. One potential point of intervention to increase the accuracy of language-based deception detection is the police interview. It is plausible that if the quality of the suspect statement is improved, the accuracy of CBCA and RM may also improve. Therefore it is important to examine how police are interviewing suspects in order to determine whether interventions at the interviewing stage may increase deception detection using language-based methods of deception detection.

1.5 Current Models of Police Interviews

1.5.1 Accusatory Versus Information Gathering Approaches

While there are numerous variations of suspect interview methods practiced throughout North America, the overarching philosophy is interrogation. This method, most popularly embodied by the "Reid Technique" focuses on gaining suspect confessions (Inbau et al., 2001). In fact investigators using interrogation approaches such

as the Reid Technique often focus exclusively on eliciting a confession, even at the expense of potentially valuable information that could be used to verify the story at a later time (Moston, Stephenson, & Williamson, 1992). This method involves an initial stage of general questioning during which the investigator attempts to detect deception through nonverbal cues that have not been reliably proven in the empirical literature (Depaulo et al., 2003). If the suspect has been deemed to be deceptive, the investigator will then shift to an interrogation, using a variety of coercive strategies to elicit a confession. The interviewer will often provide a moral or "face saving" motivation for the suspect's actions in an attempt to have the suspect confess. The interviewer often aggressively confronts any denials of guilt and will urge the suspect to confess to atone or relieve guilt (Inbau et al., 2001).

Although the Reid Technique is extremely popular, psychologists argue that this method has not proven to be effective under empirical scrutiny. No specific facet of the Reid Technique, or any similar method, has been positively linked to increase in true confessions. In fact, empirical studies have demonstrated that investigators trained in the Reid Technique actually perform worse than untrained investigators. Investigators using this interview are more likely to view honest people as lying, and are much more confident in their assessments, despite performing worse than untrained participants (Kassian & Fong, 1999; Vrij et al., 2006). Perhaps one major reason for this finding is the reliance on behavioural cues to determine if someone is lying while being questioned. In an interesting study, Vrij et al. (2006) demonstrated that regardless of whether a person is telling the truth or lying, he/she will change his/her behaviours in similar ways to correspond to the type of question being asked during an interview. Therefore, the

questioning style embodied by the Reid Technique may in fact elicit the behavioural responses that the interviewer has been taught to interpret as signs of guilt. Consistent with these findings, the Reid Technique has been linked to many publicized instances of coerced false confessions, specifically in cases of extended interviews, and individuals with diminished capacity or mental illness (Drizin & Leon, 2004; Kassin et al., 2010). Consequently, the use of coercive interview methods such as the Reid Technique is a topic of great controversy.

Well publicized cases of false confessions led scholars in the United Kingdom to critically evaluate modern police interview procedures. This investigation determined that the Reid Technique and similar coercive methods are not effective, leading to the adoption of a less coercive approach termed "PEACE" (Dixon, 2010). The PEACE method involves five stages: planning and preparation, engage and explain, account, clarify and challenge, and evaluation. The PEACE approach shifts the goal of the interview from eliciting a confession from a suspect to getting a statement from the witness that can be verified against corroborating evidence and statements (Dixon, 2010). Although this method has drastically reduced the negative consequences of coercive methods, the overall effectiveness of the PEACE method is questionable. Clarke, Milne, and Bull (2011) noted that there is no measurable advantage to using the PEACE method in terms of actual information gathering and deception detection over taking a simple statement. While the PEACE method has taken an important step in moving away from attempting to determine deception through body language and eliciting a confession towards using cooperative interviewing that focuses on statements, the PEACE method does not appear to actually improve the quantity and accuracy of information or the

ability of officers to detect deception. Therefore the PEACE approach is not hypothesized to increase the accuracy of language-based deception detection methods. However it is conceivable that an information gathering interview will allow for increased deception detection by increasing the sensitivity of Reality Monitoring.

1.5.2. Modern Interventions to Increase Cognitive Load

Recent advances in the empirical literature have provided techniques that may increase the amount of information gathered in an interview and to actively elicit differences between true and false accounts. In a series of studies, Vrij argues that the key to deception detection is cognitive load (Vrij, Mann, Leal, & Fisher, 2010; Vrij, Mann, & Leal, 2013). Lying is argued to involve a series of cognitive operations, including; recalling a story that does not have rich mental associations from a script, inhibiting signs of anxiety, and monitoring the target to ensure that the false account is being accepted. Conversely, telling the truth is believed to be merely an exercise in recall. Human beings are practiced liars, and therefore people's mental processes have become so efficient that these extra cognitive demands are undetectable in most situations (Vrij, Mann, & Leal, 2013). However, Vrij, Mann, Leal & Fisher (2010) demonstrated that by manipulating cognitive load on the story teller, differences between true and false accounts emerge. Constantly maintaining eye contact is hypothesized to increase cognitive load, and placing this demand on story tellers resulted in liars making less mention of spatial features and being unable to recall events out of an unrehearsed order. Additionally, untrained university students were able to discriminate between truth and lies above chance level when the person was directed to maintain eye contact, however the effect sizes were deemed to be small (Vrij et al., 2010). Similarly, research has demonstrated

that reverse recall assists in deception detection. Vrij et al., (2008) requested that college students either participate in a game with a confederate that culminated in a lost wallet, or asked participants to fabricate a story of such an event with appropriate guidelines. Participants were asked to tell their version of the story either forward, or in reverse order. The reverse order condition allowed for greater discrimination between true and false accounts, when police detectives were requested to view this footage; however, the effect sizes were small. The authors argue that the reverse recall condition increases cognitive load on participants, allowing for differences to emerge. This current vein of research is consistent with the proposition that interventions in the interview process will allow for greater discrimination between true and false accounts, impeding a liar's ability to tell a coherent, consistent, and believable story.

1.5.3 The Cognitive Interview for Suspects

The research literature indicates that information gathering interviews may be ethically and practically superior to accusatory police interviews. Further, information gathering interviews that actively induce cognitive load may increase the ability to detect deception. The Cognitive Interview for Suspects (CIS- Geiselman, 2012) is an interviewing style that appears to satisfy both of these criteria. The CIS is a modified version of the original Cognitive Interview (CI), which is a successful and empirically validated technique that has been used to elicit statements from victims and witnesses of crimes for decades**.** The CI was developed using memory research and has consistently been found to increase the amount and accuracy of information recalled in a multitude of studies (Kohnken et al., 1999). The CI, originally developed by Fisher and Geiselman (1984), has been successfully employed by numerous police services for the past 20 years

(Geiselman et al., 1984). Following this protocol, the interviewee is first asked to recall the event to the best of his/her ability in a free narrative, with minimal intervention from the interviewer. The second stage, relying on encoding specificity, asks the witness to reinstate the context of the event, both in terms of subjective feelings and external surroundings. This stage is conducted verbally; however, more recent research has demonstrated the utility of allowing the witness to create a brief sketch to assist in recreating the context of the incident (Dando, Wilcox, & Milne, 2009). In the next phase, the witness is asked to recall the event in different temporal orders, most prominently in reverse order. Finally the witness is asked to recall the event from a different perspective in the same context. This task can involve asking the witness how the event would have looked from the perspective of another person in the room, or alternatively from a camera placed overhead or on the wall. After these interventions have been completed, the individual is asked to recall the event in its entirety. In addition to the aforementioned stages, Fisher and Geiselman (1992) provided additional recommendations for police regarding communications skills that would allow the Cognitive Interview to be used to its fullest extent, which has been referred to as the Enhanced Cognitive Interview (ECI).

The Cognitive Interview has been extensively tested in both field and strict laboratory studies for decades. In a meta-analysis, Kohnken et al. (1999) reported that the CI significantly improved recall in 53 of the 55 studies reviewed. Perhaps even more impressive, 32 of these studies demonstrating an increase of information recalled at least 30% over baseline. It is important to note that the increased information provided by interviewee is not a result of confabulations. The studies have shown that the CI has an accuracy rating of 85%, outperforming the standard police interview (82%) for witness

statements. The CI is a robust method that has been demonstrated to be effective in increasing accurate information recalled in a variety of contexts and among populations of differing mental faculties (Fisher et al., 2000 Robinson & McGuire, 2006; Wright & Holliday, 2007).

Recently, Geiselmann (2012) proposed a modified version of the Cognitive Interview, called the Cognitive Interview for Suspects (CIS) that would be suitable for suspect interviewing. This protocol involves an initial rapport building stage, followed by the first retelling of the story in its entirety. The interviewee is requested to draw the scene and use this tool to tell the story again. Once the interviewee has told the story again, the interviewer asks a series of open ended-follow up questions. The interviewee is then directed to tell the story backwards. At this point the interviewer challenges any inconsistencies that are present in the story, followed by a final recall of the event. Geiselmann (2012) conducted an initial pilot study that demonstrated the efficacy of this method. Twenty participants were directed to tell one true and one fabricated story to a trained interviewer. While the interviewers could not distinguish between true and false accounts during the initial telling, they were highly accurate at the conclusion of the interview.

The Cognitive Interview for Suspects is a promising method of police interviewing that meets the objectives of a successful deception detection technique. First, from a policing perspective, it shifts the focus away from accusations to an information gathering approach. The original CI has been a long standing and effective method of police interviewing that is accepted in court and that has been demonstrated to increase the amount of information provided in a wide array of populations and

timeframes. Further, this method adopts many of the interventions that have been demonstrated to increase deception detection through increased cognitive load. Finally, this method appears to be compatible with verbal deception detection techniques. The increased information provided should increase the sensitivity of actuarial scales, such as Reality Monitoring and CBCA techniques.

While Reality Monitoring and the CBCA are both empirically validated actuarial measures with comparable levels of accuracy, the current thesis argues that Reality Monitoring may be more applicable to police interviews for a variety of reasons. First, Reality Monitoring is simpler to score and has been modified to rely on concrete scaling such as amount of visual details rather than CBCA, which provides subjective opinions such as "coherence" and "realism" (Sporer, 1997; Vrij et al., 2004). Second, Reality Monitoring is steeped in cognitive principles and directly measures details that are actively elicited through the CIS. Third, in a comparison study, Vrij et al. (2004) observed that Reality Monitoring dramatically outperformed the CBCA in a mock theft scenario. Finally, Reality Monitoring includes a measure of deceptiveness, in contrast to the CBCA which only assesses degree of honesty. Therefore, while the CBCA is a reliable deception detection method, the current research considers the effectiveness of Reality Monitoring in detecting deception in statements gained through the CIS.

1.6. Overview of Studies

The purpose of my dissertation is to combine an information gathering interview and language-based deception detection technique to provide an effective method of

police interviewing that allows for reliable deception detection regardless of the experience of the interviewer and personality traits of the interviewee. The collective body of empirical literature has indicated that the use of actuarial scales provides reliable deception detection above chance levels. Further, researchers have argued for the movement towards interviewing methods that emphasize information gathering over confessions, and that may actively elicit cues to deception. The series of studies presented will provide evidence that the application of Reality Monitoring to statements elicited by a modified version of the Cognitive Interview for Suspects provides an effective method of suspect interviewing that increases the amount of information provided and detects deception with a high degree of accuracy. Reality Monitoring will be operationalized using the 6 criteria previously validated by Vrij in a series of studies (Vrij et al., 2008; Vrij, Mann, Leal, & Fisher, 2010). The purpose of using this scoring system is to provide concrete and unambiguous criteria, eliminating more subjective criteria such as "vividness". Further it should be noted that my thesis will be using a modified version of the CIS, which eliminates the follow-up questioning phase and standardizes the rapport building phase. The purpose of this alteration is to ensure that the questions are standardized to minimize the effects of interviewer beliefs on the results.

Study 1 considers the effectiveness of the combination of Reality Monitoring in the Cognitive Interview for Suspects in a mock theft scenario. This study demonstrated an overall deception detection accuracy of 86.6% under controlled laboratory conditions. Study 2 provides further evidence for the necessity of Reality Monitoring by comparing the accuracy of this measure to subjective observer ratings. In this study, participants

viewed the interviews conducted in Study 1 and were requested to rate deceptiveness. The results indicated that Reality Monitoring was highly accurate, while subjective observer ratings hovered around chance. Further analysis indicated that the CIS led to more details recalled at the conclusion of the interview, further validating the CIS as an effective information gathering interview. Study 3 considers whether certain personality traits lead to increased ability to deceive others, both in terms of subjective ratings and the RM scale. This study considered sub-clinical psychopathy and social dominance. The results of Study 3 indicated that neither personality trait led to an increased ability to deceive either subjective observers or the RM scale. Collectively, the three studies presented provide strong evidence for the use of the CIS in combination with Reality Monitoring as an effective method of increasing information gathered and detecting deception.

1.7 References

Blair, J. P., Levine, T. R., Reimer, T. O., & McCluskey, J. D. (2012). The gap between reality and research. *Policing: An International Journal of Police Strategies & Management, 35*(4), 723-740. doi:10.1108/13639511211275553.

Bond, C. F., Jr., & DePaulo, B. M. (2006). Accuracy of Deception Judgments. *Personality and Social Psychology Review*, 10(3), 214-234. doi:10.1207/s15327957pspr1003_2.

Buller, D.B., Burgoon, J.K. (1996). Interpersonal deception theory. *Communication Theory*, 6, 203–242.

Burgoon, J. K. (2015). Deception Detection Accuracy. *The International Encyclopedia of Interpersonal Communication*, 1–6.

Clarke, C., Milne, R., & Bull, R. (2011). Interviewing suspects of crime: The impact of peace training, supervision and the presence of a legal advisor. *Journal of Investigative Psychology and Offender Profiling*, 8,(2), 149-162. doi:10.1002/jip.144.

Craig, R. A., Scheibe, R., Raskin, D. C., Kircher, J. C., & Dodd, D. H. (1999). Interviewer questions and content analysis of children's statements of sexual abuse. *Applied Developmental Science*, 3(2), 77-85. doi:10.1207/s1532480xads0302_2.

Dando, C., Ormerod, C., Wilcock, R., & Milne, R. (2011). When help becomes hindrance: Unexpected errors of omission and commission in eyewitness memory resulting from change temporal order at retrieval? *Cognition*, 121(3), 416-421.

Dando, C.,Wilcox, R., & Milne, R. (2009). The cognitive interview: The efficacy of a modified mental reinstatement of context procedure for frontline police investigators. *Applied Cognitive Psychology*, 23, 138–147

Depaulo, B., Malone, B., Lindsay, J., Mulhenbruck, L., Charlton, K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin*, 129(1), 74-118.

DePaulo, B. M., & Pfeifer, R. L. (1986). On-the-job experience and skill at detecting deception. *Journal of Applied Social Psychology, 16*, 249–267. http://dx.doi.org/10.1111/j.1559-1816.1986.tb01138.x

Dixon, D. (2010). Questioning suspects: A comparative perspective. *Journal of Contemporary Criminal Justice*, 26(4), 426-440.

Drizin, S. A., & Leo, R. A. (2004). The problem of false confessions in the post dna world. *North Carolina Law Review*, 82, 891-1004.

Ekman, P., & O'Sullivan, M. (1991). Who can catch a liar? *American Psychologist*, 46(9), 913-920. doi:10.1037/0003-066X.46.9.913

Esplin, P. W., Boychuck, T., & Raskin, D. C. (1988, June). A field validity study of criteria-based content analysis of children's statements in sexual abuse cases. Paper presented at the NATO Advanced Study Institute on Credibility Assessment, Maratea, Italy.

Fisher, R.P., Falkner, K,L., Trevisan, M., & McCauley, M. (2000). Adapting the Cognitive Interview to Enhance Long-Term (35 Years) Recall of Physical Activities. *Journal of Applied Psychology*, 85(2), 180-189.

Fisher, R. P., & Geiselman, R. E. (1992). Memory enhancing techniques for investigative interviewing:The Cognitive Interview. Springfield, IL: Charles C.Thomas.

Geiselman, R. E. (2012). The cognitive interview for suspects. *American Journal of Forensic Psychology*, 30, 1–16.

Geiselman, R. E., & Fisher, R. P. (2014). *Interviewing victims and witnesses. Investigative interviewing: A handbook of best practices*. Toronto, Canada: Thomas Reuters Publishing.

Geiselman, R. E., Fisher, R. P., Firstenberg, I., Hutton, L. A., Sullivan, S. J., Avetissian, I.,and Prosk, A. (1984). Enhancement of eyewitness memory: an empirical evaluation of the cognitive interview. *Journal of Police Science and Administration*, 12, 74-80.

Gnisci, A. Caso, L. Vrij, A. (2010) Have You Made Up Your Story? The Effect of Suspicion and Liars' Strategies on Reality Monitoring. *Applied Cognitive Psychology*, 24, 762–773.

Green, D. M., & Swets, J. A. (1966). *Signal detection theory and pscyhophysics*. New York, NY: Wiley.

Hare, R. D. (1993*). Without Conscience: The disturbing world of psychopaths among us*. New York: NY, Pocket books.

Hartwig, M. Granhag, P. Stromwall, L &Vrij, A. (2004). Police officer's lie detection accuracy: Interrogating freely vs observing video. *Police Quarterly*, 7(4), 429-456.

Höfer, E., Akehurst, L., & Metzger, G. (1996, August). Reality monitoring: A chance for farther development of CBCA? Paper presented at the annual meeting of the European Association on Psychology and Law, Siena, Italy.

Inbau, F. E., Reid, J. E., Buckley, J. P., & Jayne, B. C. (2001). *Criminal interrogation and confessions* (4th ed.). Gaithersburg, MD: Aspen Publishers, Inc.

Kassin, S. M., Drizin, S. Grisso, T., Gudjonsson, G. H., Leo, R. A., & Redlich, A. D. (2010). Police-induced confessions: Risk factors and recommendations. *Law and Human Behavior*, *34*, 3–38. http://dx.doi.org.proxy.library.brocku.ca/10.1007/s10979-009–9188-6.

Kassin, S. M., & Fong, C. T. (1999). "I'm innocent!": Effects of training on judgments of truth and deception in the interrogation room. Law and Human Behavior, 23(5), 499-516. doi:10.1023/A:1022330011811

King, W., & Dunn, T. (2010). Detecting deception in field studies. *Policing: An International Journal of Police Studies and Management,* 33(2), 305-320.

Kleinmuntz B., & Szucko, J.J. (1984). Lie detection in ancient and modern times: a call for contemporary scientific study. *American Psychologist*, 39,766–776.

Köhnken, G. (1987). Training police officers to detect deceptive eyewitness statements. Does it work? *Social Behaviour, 2,* 1–17.

Köhnken, G., Milne, R., Memon, A., & Bull, R. (1999). The cognitive interview: A meta-analysis. *Psychology, Crime & Law, 5*(1–2), 3-27. http://dx.doi.org/10.1080/10683169908414991.

Kraut, R. E. (1980). Humans as lie detectors: Some second thoughts. *Journal of Communication, 30,* 209–218. http://dx.doi.org/10.1111/j.1460-2466.1980.tb02030.x

Lamb, M. E., Sternberg, K. J., Esplin, P. W., Hershkowitz, I., Orbach, Y., & Hovav, M. (1997). Criterion-based content analysis: A field validation study. *Child Abuse & Neglect,* 21(3), 255-264. doi:10.1016/S0145-2134(96)00170-6

Lee, Z., Klaver, J. R., & Hart, S. D. (2008). Psychopathy and verbal indicators of deception in offenders. *Psychology, Crime & Law,* 14(1), 73-84. doi:10.1080/10683160701423738

Levine, T.R., Park, H.S., & McCornack, S.A. (1999). Accuracy in detecting truths and lies: Documenting the “veracity effect”. *Communication Monographs*, 66, 125–144.

Mann, S., Vrij, A., Bull, R. (2002). Suspects, lies and videotape: an analysis of authentic high-stakes liars. *Law & Human Behavior*, 26, 365–376.

Massip, J., Sporer, S., Garrido, E., & Herrero, C. (2005). Detection of deception with reality monitoring: A critical review. *Psychology, Crime and Law*, 11(1), 99-122.

Mortensen, C., & Cialdini, R. (2010). Full-cycle social psychology for theory and application. *Social and Personality Psychology Compass, 4,* 53–63. http://dx.doi.org/10.1111/j.1751-9004.2009.00239.x

Moston, S., Stephenson, G. M., & Williamson, T. (1992). The effects of case characteristics on suspect behavior during police questioning. *British Journal of Criminology, 1,* 23–40.

Paulhus, D. L., & Williams, K. M. (2002). The Dark Triad of personality: Narcissism, machiavellianism and psychopathy. *Journal of Research in Personality*, 36(6), 556-563. doi: http://dx.doi.org.proxy.library.brocku.ca/10.1016/S0092-6566(02)00505-6

Raskin, D.C. & Esplin, P.W. (1991). Statement validity assessment: Interview procedures and content analysis of children's statements of sexual abuse. *Behavioral Assessment*, 13, 265-291.

Robinson, J. & McGuire, J. (2006). Suggestibility and children with mild learning disabilities: The use of the cognitive interview. *Psychology, Crime & Law*, 12(5), 537-556.

Ruby, C. & Brigham, J. (1997). The usefulness of the criteria-based content analysis technique in distinguishing between truthful and fabricated allegations. A critical review. *Psychology, Public Policy and Law*, 3(4), 705-737.

Sporer, S. L. (1997). The less travelled road to truth: Verbal cues in deception detection in accounts of fabricated and self-experienced events. *Applied Cognitive Psychology, 11,* 373–397. http://dx.doi.org/10.1002/(SICI)1099-0720(199710)11:5_373::AID-ACP461_3.0.CO;2-0

Sporer, S. L. & Hamilton, S. C. (1996). Should I believe this? Reality monitoring of invented and selfexperienced events from early and late teenage years. Poster presented at the NATO Advanced Study Institute. Port de Bourgenay, France, June 1996.

Sporer, S. L. & Kupper, B. (1995). Realita¨tsu¨berwachung und die Beurteilung des Wahrheitsgehaltes von Erza¨hlungen: Eine experimentelle Studie [Reality monitoring and the judgment of credibility of stories: an experimental study]. Zeitschrift fu¨ r Sozialpsychologie, 26, 173-193.

Steller, M., Wellershaus, P., & Wolf, T. (1988, June). Empirical validation of Criteria-Based Content Analysis. Paper presented at the NATO Advanced Study Institute on Credibility Assessment, Maratea, Italy.

ten Brinke, L., & Porter, S. (2012). Cry me a river: Identifying the behavioral consequences of extremely high-stakes interpersonal deception. *Law and Human Behavior, 36,* 469–477. http://dx.doi.org/10.1037/h0093929.

The Global Deception Research Team. (2006). A World of Lies. *Journal of Cross-Cultural Psychology*, 37(1), 60-74. doi:10.1177/0022022105282295.

Vrij, A. (2005) Criteria-based content analysis: A review of the first 37 studies. *Psychology, Public Policy and Law*, 11(1), 3-41.

Vrij, A. (2006). Challenging interviewees during interviews: The potential effects on lie detection. *Psychology, Crime & Law*, 12(2), 193-206.

Vrij, A. (2008) Nonverbal dominance vs verbal accuracy in lie detection: A plea to change policing practice. *Criminal Justice and Behaviour*,35(10), 1323-1336.

Vrij, A., Akehurst, L., & Morris, P.M. (1997). Individual differences in hand movements during deception. *Journal of Nonverbal Behavior*, 21, 87–102.

Vrij, A., Akehurst, L., Soukara, S., & Bull, R. (2004). Let me inform you how to tell a convincing story: CBCA and Reality Monitoring scores as a function of age, coaching and deception. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement, 36,*113–126. http://dx.doi.org/10.1037/h0087222

Vrij, A., Edward, K., & Bull, R. (2001). Stereotypical verbal and nonverbal responses while deceiving others. *Personality and Social Psychology Bulletin*, 27, 899–909.

Vrij, A. Edward, K. Roberts, K. & Bull, R. (2000). Detecting deceit via analysis of verbal and nonverbal behavior. *Journal of Non Verbal Behaviour*, 24 (4), 239-263.

Vrij, A. & Mann, S. (2006). Criteria-Based Content Analysis: An empirical test of its underlying processes. *Psychology, Crime & Law*, 12 (4), 337-349.

Vrij, A., Mann, S., Fisher, R., Leal, S., Milne, B., & Bull, R. (2008). Increasing cognitive load to facilitate lie detection: The benefit of recalling an event in reverse order. *Law and Human Behavior*, 32, 253-265.

Vrij, A., Mann, S., Leal, S., & Fisher, R. (2010), 'Look into my eyes': can an instruction to maintain eye contact facilitate lie detection? *Psychology, Crime & Law*,16(4), 327-348.

Vrij, A. Leal, S., Mann, S., & Granhag, P.A. (2011). A comparison between lying about intentions and past activities: verbal cues and detection accuracy. *Applied Cognitive Psychology*, 25, 212–218.

Vrij,. A., Leal, S., Granhag, P.A., Mann, S., Fisher, R.P., Hillman, J., & Sperry, K. (2009). Outsmarting the liars: the benefit of asking unanticipated questions. *Law and Human Behavior*, 33, 159–166.

Wright, A., & Holliday, R. (2007). Interviewing cognitively impaired older adults: How useful is a Cognitive Interview? *Memory*, 15(1), 17-33.

Wright Whelan, C., Wagstaff, G.F., & Wheatcroft, J. M. (2015). Subjective cues to deception/honesty in a high stakes situation: An exploratory approach. *The Journal of Psychology: Interdisciplinary and Applied*, 149(5), 517-534.

Yuille, J. C. (1988). The systematic assessment of children's testimony. *Canadian Psychology/Psychologie canadienne*, 29(3), 247-262. doi: http://dx.doi.org.proxy.library.brocku.ca/10.1037/h0079769.

Zuckerman, M., DePaulo, B. M., & Rosenthal, R. (1981). Verbal and nonverbal communication of deception. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 14, pp. 1–57). New York, NY: Academic Press

Chapter 2: Using Reality Monitoring to Improve Deception Detection in the Context of the Cognitive Interview for Suspects

Abstract

Research has found that deception detection accuracy in the context of suspect interrogation hovers around chance levels. Geiselman (2012) adapted the Cognitive Interview (typically used for witnesses) for use with suspects (CIS) and found that judgments of deception were more accurate than previous interrogation techniques. The current study attempted to use the CIS to improve deception detection with Reality Monitoring (RM: Vrij et al., 2008), which has already been validated in the context of witness statements. One hundred and sixty-six undergraduate students were randomly assigned to two conditions. In the Truthful condition, participants played a game with a confederate, while in the Deceptive condition, participants rehearsed (but did not experience) a synopsis of the game scenario. Participants in the Deceptive condition were also instructed to steal $10 from a confederate's wallet. In both conditions, $10 was purported to be missing and a researcher blind to condition conducted a CIS. Statement veracity was coded using six of the RM criteria advanced by Vrij et al. (frequency of visual, auditory, spatial, temporal, cognitive, and affective details). According to results from a MANOVA, truthful and deceptive statements differed significantly on all RM criteria, with the exception of affective details, validating the importance for evaluation of statement veracity ($p \leq .01$). Further, a binary logistic regression found that combining the RM criteria together correctly classified 86.6% of statements, χ^2 (6) = 114.4, p <.001, with excellent sensitivity and specificity (.899 and .833, respectively). As well, Visual, Auditory and Cognitive details uniquely predicted condition. Findings support using RM criteria to detect deception in interviews conducted with the CIS.

Chapter 2: Study 1

Note: This section is based on the article Logue, M. Book, A., Frosina, P., Huizinga, T., & Amos, S. (2015). Using Reality Monitoring to improve deception detection in the context of the Cognitive Interview for Suspects. *Law and Human Behaviour, 39,* (44), 260-367. DOI: http://dx.doi.org/10.1037/lhb0000127. Certain portions of this section may differ from the article as published. Any questions regarding these differences may be addressed to Michael Logue.

2.1 Introduction

Deception detection is an area of psychological research that has great theoretical and practical applications, particularly in the field of law enforcement. Problematically, attempts to establish reliable deception detection techniques have not been fruitful (Geiselman, 2012; Hartwig, Granhag, Stromwall & Vrij, 2004). In fact, numerous studies of many different populations have demonstrated an accuracy rating of approximately 54-57%, not significantly better than the 50% success rate that would be expected by chance (Bond & Depaulo, 2006; Hartwig, Granhag, Stromwall, & Vrij, 2004; Kraut, 1980). Given the relative frequency of deception in police interviews and the experience of officers in an interviewing context, it would be expected that law enforcement officers should be better equipped to detect deception. Surprisingly, law enforcement training and experience do *not* predict accurate judgment in laboratory settings. For example, Kraut and Poe (1980) found that lay persons and customs officers did not differ in their ability to detect deception of individuals suspected of smuggling contraband. Further, veteran police officers do not perform better than new recruits when listening to interviews (Depaulo & Pfeiffer, 1986; Köhnken, 1987). Vrij & Mann (2001a, 2001b) noted a slight improvement over chance in detection accuracy when officers viewed suspect interrogations (64%). However, the same officers performed at chance

level when watching videos of people who were asking for help locating members of their families whom they had actually murdered. Additionally, Hartwig, Granhag, Stromwall and Vrij (2004) demonstrated that officers did not fare any better in detecting deception when they were directly interviewing the suspect in comparison to passively watching the interviews.

2.1.1 Verbal vs Non-Verbal Cues to Deception

One potential contributing factor to the poor performance observed in laboratory settings is the reliance on body language cues to determine deception. This practice is evident in law enforcement, as policing manuals give higher relative importance to behavioral cues over verbal cues in determining statement veracity. In a review of 18 policing manuals, King and Dunn (2010) noted that authors often perpetuated the notion that one could reliably differentiate between truth and lies using nonverbal cues such as gaze aversion, fidgeting and sweating. Unfortunately, the empirical literature has not validated the link between non-verbal behavior and deception, and results have been quite mixed. Studies have demonstrated somewhat reliable trends for higher pitch (Vrij, 2000) and increased hand and foot movement (Sporer & Schwandt, 2002) during deception. However, these cues are extremely context dependent and may vary as a function of various factors such as time to rehearse, content, and relative stakes (Stromwall, Hartwig, & Granhag, 2006). A review of 120 studies assessing 158 different non-verbal cues such as body positioning, vocal speed and pitch, sweating and eye movements found that there is no completely reliable non-verbal cue to deception. While this review does indicate that liars tend to speak in a higher pitch and use fewer gestures, these general guidelines can be dramatically impacted by context (DePaulo et al., 2003).

Although the efficacy of body language cues in determining deceit has been mixed, research has indicated that verbal methods of deception detection may improve accuracy. Johnson and Raye (1981) proposed the hypothesis that truly-experienced events and fabricated stories of events are experienced differently and therefore are in fact encoded differently in the brain. Truly-experienced events are encoded with sensory cues, the person's physical and emotional state, and in chronological order. Conversely, fabricated events are created through imagination, and will lack the aforementioned cues. The differences in encoding may be reflected in the language that people use to describe these events. This process was termed Reality Monitoring (RM), and researchers have applied these principles to create post-hoc scales to assess veracity of witness statements (Masip, Sporer, Garrido, & Herrero, 2005). Reality Monitoring assumes that true accounts will contain more sensory, contextual, affective, and cognitive information than false accounts. Within Reality Monitoring, a subset of eight original criteria are applied to statements to determine veracity: vividness, sensory information, spatial information, temporal information, coherence, emotion, realism, and cognitive operations (Masip et al., 2005). Empirical research has shown that Reality Monitoring successfully discriminates between true and false statements above chance levels. This method has been applied to classifying true and false stories from varying timeframes ranging from childhood experiences to immediate recall of experienced or fabricated events (Sporer & Kupper, 1995; Sporer & Hamilton, 1996; Masip et al., 2005). Additionally, Reality Monitoring has been used to classify true and false recollections of individuals who watched videotapes of thefts, simulating the experience of witnesses of crime (Vrij et al., 2000). Meta-analysis of this method reveals that numerous studies have often found

accuracy ratings ranging between 64-71% (Masip et al., 2005). However, empirical research on Reality Monitoring has often only used subsets of the eight criteria. Also, there is not universal agreement on how certain criteria should be operationalized, or which criteria are important for deception detection (Masip et al., 2005).

Reality Monitoring has an additional benefit of using objective criteria and scoring rather than the subjective judgment of the interviewer to determine statement veracity. In various fields, the empirical data are compelling: Research has demonstrated that actuarial scales that use statistical relationships to predict outcomes *always* out-perform subjective judgments (Garb, 1989; Grove et al., 2000; Mossman, 1994). Actuarial measures are comprised of cues/items that have been empirically derived, that is, have been shown to relate to the outcome in numerous research studies. Garb's (1989) meta-analysis found that subjective judgments in a variety of contexts are around chance levels, regardless of expertise and experience, and that actuarial measures tend to perform much better.

Reality Monitoring consistently performs better than behavioral cues at assessing deceit, and provides an objective basis for judging deception in comparison to the subjective classifications that have not been validated in the literature. However, previous research on this approach has typically applied the criteria to uninterrupted statements (Masip et al., 2005), while real world police interviews involve the asking of questions that may serve to increase the information gathered in the statement. Applying Reality Monitoring to interviewing methods that emphasize information gathering may increase the sensitivity of the scale and improve the accuracy of deception detection.

2.1.2 Information Gathering

Police interviews often have two major yet often conflicting goals, to gather information and to obtain a confession. Accusatory interrogations tend to emphasize obtaining a confession, while non-accusatory confessions emphasize information gathering. Until recently, the most popular suspect interviewing method in North America has been the Reid Technique, which has been taught to hundreds of thousands of officers internationally (Snook et al., 2010). Reid and similar techniques often involve using nonverbal cues to determine whether the person being interviewed is being deceptive. If the suspect has been deemed to be deceptive using these cues, the investigator will then shift to an interrogation. The interviewer will repeatedly confront and directly dispute any denials of guilt, will appeal to morality, urging the suspect to confess to "get it off your chest", and will often provide a face-saving alternative explanation that the suspect can adopt as a rationale for the offense. The Reid Technique focuses primarily on eliciting a confession, even at the expense of getting an account of the event that could later be verified (Moston, Stephenson, & Williamson, 1992). Not only does the motivation to gain a confession influence the line of questioning of an interviewer away from potentially valuable information, the questioning style often negatively influences the responsiveness of the suspect. Vrij, Mann, Kristen and Fisher (2007) observed that suspects who were interviewed in an accusatory fashion responded with short statements and provided the fewest verbal signs of deceit. Evans et al. (2013) found that adopting an "information gathering" approach to suspect interviewing led to an increase in critical details disclosed by the interviewee and even a greater number of admissions as compared to those interviewed with an "accusatory" style.

In contrast to the accusatory interviewing style that has typically been used with suspects, police services often adopt an information gathering style when interviewing victims and witnesses. The Cognitive Interview has been a successful and empirically validated approach for interviewing victims and witnesses. This method applies the principles of encoding specificity and memory retrieval to increase the quality of witness statements. The Cognitive Interview has been strenuously tested in both field and strict laboratory studies for the past two decades. In a review of 55 experimental comparisons involving over 2,447 interviews, Köhnken, Milne, Memon, and Bull (1999) reported that the Cognitive Interview significantly improved recall in 53 of the 55 studies. Perhaps even more impressively, the Cognitive Interview provided an increase in amount of recalled information ranging between 25% and 147%, with 32 studies demonstrating an increase of over 30%. The increased information does not sacrifice accuracy. Studies have shown that the Cognitive Interview has an accuracy rating of 85%, slightly better than the standard police interview (82%). This method has been validated in a variety of contexts, and witness populations, over an extended period of time (Robinson & McGuire, 2006; Wright & Holliday, 2007; Fisher, Falkner, Trevisan & McCauley, 2000).

The success of the Cognitive Interview with victims and witnesses led Geiselman (2012) to adapt it for use with suspects. Geiselman named this approach the Cognitive Interview for Suspects (CIS). The resulting interview has eight stages: 1) rapport building, 2) initial recall of event, 3) reinstate the context of the event by drawing the event in sequential order, 4) additional recall, 5) follow-up questions (open ended), 6) recall of event in reverse order, 7) interviewer challenges the story as false, and 8) final recounting of event. In the last stage, the suspect is allowed to clarify or change any

information he/she wishes, before the interview is concluded. In the first empirical test of this process, Geiselman (2012) studied whether this new method would increase deception detection. Geiselman requested that 20 students tell one true and one false story while being interviewed by one of six trained interviewers using this protocol. After each stage, the researchers rated whether they felt the suspect was being truthful or deceptive. Geiselman (2012) discovered that while the interviewers were not able to accurately detect deception in the initial stages, they became progressively more accurate throughout the interview, to an "almost perfect level of discriminability" (Geiselman & Fisher, 2014, p.14). In addition to the preliminary study on the entire CIS conducted by Geiselman, studies have provided support for individual stages of the CIS, providing insight into why this method may be successful. There are at least three characteristics of the CIS that could account for this accuracy. First, the emphasis is on information gathering, which allows for detection of inconsistencies. Second, the CIS (specifically, the reverse recall stage) increases cognitive load, tending to enhance the differences between truth tellers and liars (Vrij et al., 2010). Finally, the increased interaction with the suspect may also improve accuracy.

As mentioned, the use of techniques such as recall in reverse order increases cognitive load on suspects, which has been effectively used to enhance the differences between truthful and deceptive individuals. A series of studies have been conducted suggesting that placing cognitive demands on storytellers increases accuracy of deception detection. For instance, Vrij, Mann, Leal and Fisher (2010) demonstrated that imposing the cognitively demanding task of maintaining eye contact reduced the amount of details that people could provide in false stories and consequently increased the ability of raters

to detect deception. Recalling a story in reverse order is a cognitively demanding task that also increases deception detection. Vrij et al. (2008) requested that college students either participate in a game with a confederate that culminated in a lost wallet, or asked participants to fabricate a story of such an event with appropriate guidelines. Participants were asked to tell their version of the story either forward, or in reverse order. The reverse order condition elicited fewer details in false accounts and allowed for greater discrimination when police detectives viewed this footage. While the effect sizes in these studies were relatively small, they highlight the possibility that police interviewing techniques may serve to actively increase deception detection. In fact, Vrij and Granhag (2012) have recently called for a shift away from attempting to passively construct a list of cues of deception to actively eliciting differences among truthful and deceptive "suspects" through empirically validated techniques.

Research also suggests that a more interactive interview (such as one that emphasizes information gathering) can also improve the interviewers' ability to detect deception. Dando and Bull (2011) allowed police officers to interview suspects while being privy to some of the "evidence" collected in the investigation. The officers interviewed suspects by either confronting the suspects with evidence at the beginning of the interview, near the end of the interview, or gradually introducing the contradictory evidence as the officer saw fit. This study indicated that officers who were able to strategically introduce contradictory evidence (termed tactical interviewing) were able to determine statement veracity (67% deceptive and 74% truthful) better than the other interview styles which performed at chance levels. This method draws many parallels with the CIS, which challenges the suspect during the interview and requires the suspect

to adapt to the numerous questions and tasks that are required throughout the various stages.

2.1.3 Present Study

The purpose of the present study was to provide support for the use of Reality Monitoring (RM) by using a suspect interview that is effective at gathering information. The Cognitive Interview for Suspects (CIS; Geiselman, 2012) appears to be a viable method of suspect interviewing that may improve the quality of suspect statements and therefore should increase the effectiveness of Reality Monitoring. This technique employs an interactive interview style and induces cognitive load; two factors that have been shown to increase deception detection. The CIS uses many of the techniques of the CI that have been shown to increase the number of details recalled by orienting the interviewee to many of the Reality Monitoring criteria; including the sensory, spatial and temporal factors of a memory. Presumably, the improvement in accuracy noted by Geiselman (2012) throughout the stages of the CIS are due to the increase in details recalled throughout truthful statements, and possibly changes in behavioral cues due to the increase in cognitive load (as found by Vrij et al., 2008). The present study focused on RM criteria for statement veracity in the context of the CIS. The scale was applied to statements gathered at the conclusion of the CIS to determine whether the RM criteria can detect deception with the improved information gathered through the Cognitive Interview. Specifically, we expected that truthful statements would differ from false statements on all of the tested RM criteria, and that the combination of all RM criteria would accurately predict whether a statement was true or fabricated.

2.2 Method

2.2.1 Participants

Participants were 166 Brock university students (67 men and 99 women Mage=21.3 age range=17-43) participating for course credit and the possibility of winning $10. Participants were randomly assigned to either the Truthful or Deceptive condition using a random numbers generator.

2.2.2 Procedure

Upon entry into the laboratory, participants were informed that the study involved storytelling, and that they would be asked a series of questions based on their experience in the laboratory. Prior to experimental manipulation, participants were introduced to researcher one and completed consent forms, as well as personality questionnaires that were used for a separate research project. Upon completion of these materials, the experimental manipulation began.

2.2.2 (a) Stage 1

The experimental paradigm involved a game of Connect 4 with a researcher, culminating in an additional researcher coming into the room and stating that money had gone missing. Participants in the Truthful condition actually played the game with the researcher. Participants in the Deceptive condition did not actually play the game but read a transcript of events that they use to construct an alibi. This paradigm was adapted from previously published research (Vrij et al., 2008; Vrij, Mann, Leal & Fisher, 2010).

Truthful Condition: Participants in this condition remained in the original room (further denoted as the "game room") and were introduced to a second researcher. Researcher one left the room, allowing researcher two to start to play a game of Connect 4 with the participant. During this game the researcher engaged the individual participants in conversations on such topics as course load, vacation, future plans and social life. After approximately five to seven minutes, researcher one re-entered the game room, picked up a textbook and left the room. The game continued for approximately five to seven minutes until researcher two stepped out to answer a phone call, leaving the participant in the room alone for a brief period before returning. Researcher two returned and the game-play resumed. After approximately three minutes, researcher one returned to the game room and stated that he forgot his wallet. Researcher one picked up a wallet that was left on the desk during the entire game and stated that $10 was missing. Researcher two reported that the participant was only left alone in the room for a brief period of time while she took a phone call. Researcher one left the room, under the guise that he was going to enlist the help of a third researcher (the interviewer) to help determine what happened. Researcher two informed the participant that he/she would be interviewed by a third researcher in a separate room to determine whether he/she took the money. The participants were informed that if they were able to convince the interviewer that they did not take the money, they would earn $10.

Deceptive Condition: Participants assigned to this condition did not experience the above event (game), but were asked to create a story about experiencing the event after reading a short synopsis of the event as experienced by the participants in the Truthful condition. First, participants were provided the initial informed consent and

questionnaires by the first researcher. The second researcher entered the game room and explained that the participant would be required to take $10 out of the wallet in the room. Researcher two provided the participant with a template based on the Truthful condition that the participant can use to construct an alibi. The second researcher informed the participants that they would be interviewed by a third researcher in a separate room and instructed them to add whatever information they deemed appropriate to make their respective alibis believable. In addition to the verbal instructions, participants in this condition were provided the template with the following information on a sheet of paper:

"You entered the room and played a few games of connect four with [researcher two]. Connect Four is a board game similar to tic-tac-toe played with discs similar to checkers pieces. The goal of the game is to be the first to line up 4 pieces on the board while taking alternating turns. A short time later, [researcher one], who shares the laboratory, enters the room and you all have a brief conversation and he leaves. The game continues until [researcher two] receives a phone call and leaves the room before returning. The game continues until [researcher one] comes back into the lab and locates the wallet that is on the desk. This person opens the wallet, and claims that there is $10 missing."

"The wallet is sitting on the table in the corner of the room. Take the $10 out of the wallet. You will be interviewed by a separate person to determine whether you took the $10. If you convince the interviewer that you did not take the money, you will get to keep the $10."

When they had read the template and confirmed they understood the instructions, participants were left alone in the room for 10-14 minutes to construct and practice their

alibi without input or assistance from either researcher. After approximately 5 to 7 minutes, a researcher entered the room to ask if the participant had any questions before leaving the participant to continue to practice. After the allotted practice time was complete, researcher two asked the participant if he/she was ready for the interview. The participant was brought into the next room to be interviewed. The timing allotments were chosen to provide consistency with the Truth condition and to ensure there was equal delay between the manipulation and subsequent interview. While participants in the Deceptive condition were not explicitly told not to mention practicing their alibi during the interview, none of the participants discussed this during their interview.

Video Recording: A video recorder was placed in the game room to record the entire interaction of stage one for both the Truthful and Deceptive conditions. This camera was hidden in a file folder box in the corner of the room that allowed for the entire room to be monitored. The purpose of this camera was to ensure that the information that participants provided in the interview was accurate. The conversations between the participants and researcher were reviewed for accuracy, and each game room session was viewed to ensure that participants in the Truthful condition did not take the money and the participants in the Deceptive condition actually took the money from the wallet.

2.2.2. (b) Stage 2

After the first stage of the study was completed, participants in both conditions were taken to a second room to meet with the interviewer. The participant was directed to a pre-arranged chair which was positioned approximately 2.5 feet from the interviewer.

A video camera sat in the corner of the room in plain sight, recording the participant. The interview was conducted face to face, with both parties seated in chairs directly across from each other without any obstructions.

Participants in both conditions were asked the same questions in the same order by the same interviewer, who was blind to the experimental condition. All interviews began with the same introduction by the interviewer:

"As you know my lab-mate [researcher one] is missing money, and we just want to find out what happened. I am not necessarily blaming you, but I would like you to provide me with a story that makes sense so I can understand what happened in the previous room. "

The interview began with two baseline questions that served as the rapport stage of the cognitive interview. The first question involved recounting the events of the past weekend and the second involved projecting where the participant saw his or her self in the next 5 years. The introduction and personal questions were based on Geiselman's (2012) recommendation to present the interviewer not as a superior or authority figure but an equal who shows interest in the "suspect" as an individual. After the baseline questions were answered the interview commenced. The interviewer asked the five questions based on the CIS in the same order. The stages were comprised of an initial recall of the event, drawing the scene to explain the sequence of events, reverse order recall, a challenge question where the researcher reports that the participant has been inconsistent, and a final recall of all the previous information including anything else the participant would like to add. The wordings of these questions followed the same structure as used by Vrij et al. (2008) in order to maintain a measure of experimental

consistency across studies. At the conclusion of each phase, the interviewer asked "is there anything else you would like to add?" before moving on to the next stage. The interviewer did not ask any clarification or additional follow up questions of any of the participants.

The interview was concluded when all questions were answered. The interviewer left the room briefly, instructing the participant that he needed to review the answers provided. After approximately 5 minutes, Researcher one returned to the room and informed all participants that the interviewer was unable to determine whether or not they were telling the truth. Depending on condition, participants were either provided with or allowed to keep $10 for their participation. Participants were debriefed about the purpose of the study, but were not told that the incentive was distributed regardless of performance, as any discussion with their classmates would have resulted in contamination of future participants.

2.2.3 Reality Monitoring Scoring

A separate researcher trained in Reality Monitoring scored the audio recording of the final interview question of each participant according to protocol. The final interview question was scored because it explicitly directed the participant to recount everything that the participant could remember about what happened in the game room, including all information previously stated and anything else that the participant would like to add. The researcher listened to the entire interview for inconsistencies throughout the questions. As a manipulation check, 30 randomly selected interviews were transcribed

and checked for accuracy to ensure that the information reported remained consistent throughout.

The third researcher, blind to experimental condition, tallied the frequency of six Reality Monitoring criteria: Visual details, auditory details, spatial details, temporal order, cognitive operations and affect. For example the statement: “He walked towards me and then asked if I took the money?” would score one tally for spatial, two for temporal, one point for visual and one point on the auditory scale. The statement, “She was sitting in the room on a chair. She had her phone in her hand and there was a cup on the table” would score 5 points for visual cues, 4 points for spatial cues”. Conversely, a comparatively vague statement such as “We played the game in the room” would score 1 point for temporal cues 1 and one point on the spatial scale. The research literature is inconsistent on which facets of Reality Monitoring are used in deception detection research. The current study considered the same six scoring factors used by Vrij et al. (2008) in a study adopting the current experimental protocol, in an effort to maintain a measure of consistency across studies for potential comparison. Reality Monitoring criteria are easy to understand, relatively simple to score and concrete with little room for interpretation (Sporer, 1997; Vrij et al., 2004; Vrij et al., 2008). The criteria used were adopted from numerous previous studies that demonstrated inter-rater reliability (r = .72-.96: Vrij et al., 2000; Vrij et al., 2004; Vrij et al., 2008).

In this study, it should be noted that cognitive operations are defined as inferences of mental states or motivations of others, rather than references to one’s own thought process. The research literature on Reality Monitoring is often unclear as to the exact definition of cognitive processes (Masip, 2005; Vrij et al., 2008). In previous

studies, cognitive factors have been defined both as one's own thoughts during an experience and a third party's mental state or motivations (Vrij et al., 2008). The present authors contend that references to the thought processes of others are fundamentally different than recollection of one's own thoughts. Specifically it is argued that fabricating a lie may involve creating a consistent thought narrative, which would cause one to reference the thoughts of others to make what sounds to be a believable story. This theory makes sense with previous conflicting findings that some studies indicate that cognitive operations indicate honesty and others have found that cognitive operations signal deception (Masip et al., 2005; Vrij et al., 2008). McCormack et al.(2009) observed that people telling fabricated autobiographical stories provided limited details of the event and will often attempt to "fill in the gaps" in the story by providing rationalizations for the actions of another that the story teller should not know. For example in the current study, the statements "[researcher 1] is absent minded, he always loses things" or "[researcher 2] was upset with her roommate over paying the rent, so she went outside to take the call because she did not want to argue about money in front of me" would be considered cognitive processes that are indicative of deception. This study only considered inferred mental processes and motivations of others as cognitive processes in an attempt to eliminate this potential confound. Therefore the current study predicts that cognitive operations will indicate deception.

2. 3. Results

The original sample contained 166 participants. A total of 9 participants were removed from analysis. In the Deceptive condition, participants were removed for the following reasons: not taking the money (n = 3), confessing to taking the money in the interview (n = 3), refusal to participate in the interview (n=1) and technical difficulties with the camera (n = 1). One participant in the Truthful condition was removed due to technical difficulties with the camera that did not allow the interview to be scored. Of the remaining 157 participants, there were 78 in the Truthful condition and 79 in the Deceptive condition. All participants in both conditions used at least one visual, auditory, spatial, and temporal cue, while cognitive operations and affective details were underutilized with 77% and 78% of participants having a score of 0 on these scales.

To determine whether the Reality Monitoring criteria were significantly different between the Truthful and Deceptive conditions, a multivariate analysis of variance was conducted which allowed us to control for inflation of Type I error that comes from conducting multiple *t*-tests. The multivariate test was significant, F (6,149) = 25.06, $p <$ .001. With the exception of the Affective Details subscale, all of the Reality Monitoring criteria differed significantly between the groups (see Table 2.1 for means, univariate *F*-tests, and effect sizes), with people in the Deceptive condition using significantly fewer visual, auditory, spatial, and temporal details, and significantly more cognitive operations. Cohen's *d* values indicate that there were small effects for affective details, moderate effects for visual, spatial and cognitive details, and large effects for temporal and auditory details.

2. 3. 1. Reality Monitoring Predicting Statement Veracity

A binary logistic regression was conducted to determine whether combining the RM criteria would accurately predict whether an individual was in the Truthful or Deceptive condition. All six criteria were entered as predictors of condition. The Hosmer and Lemeshow goodness of fit test was not significant, meaning that the model fit well with the data, χ^2 (8) = 5.60, p =.69, and the overall model significantly predicted condition, χ^2 (6) = 114.400, p <.001, indicating that the full RM scale reliably distinguished between conditions. The RM scale correctly classified 89.9% of Truthful interviews and 83.3% of Deceptive interviews for a combined accuracy score of 86.6% (specificity = 90%; sensitivity = 83%), which translates into a large effect size (*Nagelkirk* R^2 = .698). Positive predictive value (PPV) was 89, indicating that a person predicted to be in the Deceptive condition had an 89% chance of actually having been assigned to that condition, and negative predictive value (NPV) was 85, meaning that a person predicted to be in the Truthful condition had an 85% chance of being in that condition.

When looking at the specific RM criteria within the model, visual, auditory and cognitive factors uniquely predicted condition (β= -.22, *Wald* = 4.29; p= <.05, β= .40, *Wald* = 30.24; p= <.001, and β = -.693, *Wald* = 4.78; p = .03 for visual, auditory and cognitive details, respectively). The remaining RM criteria were not uniquely predictive of condition. Interestingly, references to cognitive details were relatively uncommon, with only 35 of the 157 suitable cases referencing cognitive operations of others (22%). Of these 35 participants, 31 were in the Deceptive group (88%).

2. 4. Discussion

The purpose of the present study was to determine the predictive utility of Reality Monitoring Criteria (RM: Masip et al., 2005) in the context of the Cognitive Interview for Suspects (CIS; Geiselman, 2012). As predicted, the Truthful and Deceptive conditions differed significantly in their scores on the RM criteria. More specifically, participants in the Deceptive condition reported fewer visual, auditory, spatial, and temporal details, and significantly more cognitive operations. These findings are in agreement with previous research conducted by Vrij et al. (2008) and McCormack et al. (2009). The second step in determining predictive utility was to conduct a binary logistic regression, predicting condition (Truthful vs. Deceptive) from all six of the RM criteria. The overall accuracy of classifying participants into Truthful and Deceptive conditions was 86.6%, with RM accurately classifying true and false accounts in 89.9% and 83.3% of cases, respectively. Taken together, the findings of our study are in line with previous research finding that RM accurately predicts whether recalled events are experienced or fabricated (Masip et al., 2005; Sporer & Hamilton, 1996; Sporer & Kupper, 1995), and true versus false witness statements (Vrij et al., 2000).

Interestingly, although this study provides experimental support for the idea that Reality Monitoring can reliably detect deception, the specific facets of Reality Monitoring were not equally predictive of statement veracity. As predicted, visual cues, auditory details and the use of cognitive operations uniquely predicted condition. However, while spatial and temporal references were also significantly higher among truthful statements; the effect sizes of these factors were relatively small. The experimental design may have contributed to the relatively small effect sizes of certain

facets of the scale. Participants in the Deceptive condition met the same researchers, sat in the same room and were provided a transcript of the same sequence of events in the Truthful condition. These controls were necessary so that those in the Deceptive condition would not provide false descriptions of the room or confederates that the research team would know to be false, potentially biasing the interviewer or scoring of the scale. However, providing the same visual, spatial, and temporal details may have served to mute the effects of certain facets of the Reality Monitoring scale.

While this study adopted a similar experimental paradigm to Vrij et al. (2008), and the CIS as described by Geiselman (2012), there were variations in this study from previous research that deserve mention. These deviations were specifically made in an effort to make the use of Reality Monitoring in the context of the CIS applicable to law enforcement officers. First, this study differed from previous research by using audio recordings rather than transcripts to score Reality Monitoring criteria. While officers do take written statements from witnesses, suspect interviews are often video recorded. Real-time assessment of deception will allow officers to conduct timely investigations instead of waiting for lengthy interviews to be accurately transcribed. Additionally, the questioning methodology in this study deviated slightly from Geiselman's (2012) approach, omitting the stage involving a series of follow-up and open- ended questions. The current study used a student interviewer with no prior police interviewing experience or deception detection training. Pre-determined questions were asked in the same order without any latitude for further questioning in order to ensure that the process, not the specific attributes or skills of the interviewer, determined results. The success of this

study indicates that the process may be effective for officers of differing skill and experience levels.

2.4.1 Limitations and Future Directions

While we have provided more support for the ecological validity of the Reality Monitoring scale, there is much research left to be done. Our study did examine the use of Reality Monitoring within an interview that includes questioning, which more closely matches the type of suspect interview conducted in the real world. However, our scenario is not one involving high stakes, as would be the case in real world interrogations, and it is quite possible that results would differ in situations that did have high stakes, as suggested by ten Brinke & Porter (2012). Considering this, as well as our reliance on a student sample, there is a clear need for verification of ecological validity. As suggested by Mortensen & Cialdini (2010), applied social psychological research needs to be conducted using multiple methodologies in both laboratory and field settings if ecological validity is to be assumed.

We used CIS to increase information gathered, but because this interview increases cognitive load and also increases the amount of information gathered, the interview itself may lead to better deception detection, regardless of the use of Reality Monitoring. In fact, Geiselman (2012) found that raters were much more accurate after viewing an entire CIS, which highlights the need for a direct test to directly test this (subjective ratings versus Reality Monitoring in context of CIS). Such a study would examine the accuracy of subjective judgment in comparison with the accuracy of prediction based on Reality Monitoring.

Finally, while the current research examines the utility of Reality Monitoring as a deception detection method, it should be noted that Criteria Based Content Analysis (CBCA) is a viable and competing nonverbal method of deception detection. Meta-analysis reveals that these methods have comparable accuracy ratings (Masip et al., 2005), and in a direct comparison of both scales using a similar methodology, Vrij et al. (2004) found that Reality Monitoring (74%) dramatically outperformed the CBCA (60%) in overall deception detection. There are three major advantages to using Reality Monitoring in conjunction with the CIS. First, Reality Monitoring is much simpler to use and requires less training and expertise (Sporer, 1997; Vrij et al., 2004). This method should therefore be more accessible to law enforcement personnel. Second, Reality Monitoring has been used in a series of studies of cognitive load using similar experimental paradigms (Vrij et al., 2008; Vrij, Mann, Leal & Fisher, 2010). Using Reality Monitoring in the present sample allows for a more direct comparison of results. Finally, CBCA exclusively measures honesty, while the cognitive facet of the Reality Monitoring scale allows for a direct measure of deception, which proved to be significant in this sample (Vrij et al., 2004). Although the current project focused on Reality Monitoring, the CBCA is a valuable tool with potential for success in this paradigm. Further research should assess the accuracy of the CBCA in relation to statements elicited by the CIS.

Table 2.1.

Summary of descriptive statistics for Reality Monitoring variables in Deceptive and Truthful conditions.

	Truthful			Deceptive							
Variable	Mean	SD	SE	Mean	SD	SE	F-test	p-value	Cohen's d	CI lower	CI Upper
Visual	7.88	4.00	0.44	6.20	2.55	0.32	2.55	0.01	0.50	0.31	2.44
Auditory	16.88	7.99	0.92	5.60	3.58	0.42	11.02	<.001	1.81	9.16	13.11
Spatial	8.92	2.94	0.34	7.66	2.90	0.32	2.78	0.01	0.43	0.38	2.22
Temporal	12.37	3.59	0.41	9.48	3.23	0.36	5.35	<.001	0.85	1.84	3.99
Cognitive	0.12	0.54	0.06	1.03	1.93	0.22	-4.00	<.001	-0.64	-1.36	-0.46
Affective	0.35	0.88	0.10	0.16	0.46	0.05	1.65	0.10	0.27	0.04	0.41

Note. N's were 79 and 78 for Deceptive Alibi and Truthful conditions, respectively. Confidence intervals are also listed for the difference between the means.

2.5. References

Bond, C. F., Jr., & DePaulo, B. M. (2006). Accuracy of deception judgments. *Personality and Social Psychology Review*, *10*, 214–234. http://dx.doi.org/10.1207/s15327957pspr1003_2

Dando, C. J., & Bull, R. (2011). Maximizing opportunities to detect verbal deception: Training police officers to interview tactically. *Journal of Investigative Psychology and Offender Profiling*, *8*, 189–202. http://dx.doi.org/10.1002/jip.145

DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenbruck, L., Charlton, K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin*, *129*(1), 74–118 http://dx.doi.org/10.1037/0033-2909.129.1.74.

DePaulo, B. M., & Pfeifer, R. L. (1986). On-the-job experience and skill at detecting deception. *Journal of Applied Social Psychology*, *16*, 249–267. http://dx.doi.org/10.1111/j.1559-1816.1986.tb01138.x.

Evans, J. R., Meissner, C., Ross, A., Houston, K., Russano, B., & Horgan, A. (2013). Obtaining guilty knowledge in human intelligence interrogations: Comparing accusatorial and information-gathering approaches with a novel experimental paradigm. *Journal of Applied Research in Memory and Cognition*, *2*, 83–88. http://dx.doi.org/10.1016/j.jarmac.2013.03.002

Fischer, R.P., Falkner, K, L., Trevisan, M., & McCauley, M. (2000) Adapting the Cognitive Interview to enhance long-term (35 Years) recall of physical activities. *Journal of Applied Psychology, 85*, (2), 180-189. doi: 10.1037/0021-90doi: 10.85.2.180

Garb, H. N. (1989). Clinical judgment, clinical training, and professional experience. *Psychological Bulletin*, *105*, 387–396. http://dx.doi.org/10.1037/0033-2909.105.3.387

Geiselman, R. E. (2012). The cognitive interview for suspects. *American Journal of Forensic Psychology*, *30*(3), 1–16.

Geiselman, R. E., & Fisher, R. P. (2014). *Interviewing victims and witnesses. Investigative interviewing: A Handbook of Best Practices*. Toronto, ON: Thomas Reuters Publishing.

Grove, W. M., Zald, D. H., Lebow, B. S., Snitz, B. E., & Nelson, C. (2000). Clinical versus mechanical prediction: A meta-analysis. *Psychological Assessment*, *12*(1), 19–30. http://dx.doi.org/10.1037/1040-3590.12.1.19

Hartwig, M., Granhag, P., Stromwall, L., & Vrij, A. (2004). Police officer's lie detection accuracy: Interrogating freely vs observing video. *Police Quarterly*, *7*(4), 429–456. http://dx.doi.org/10.1177/1098611104264748.

Johnson, M. K., & Raye, C. L. (1981). Reality Monitoring. *Psychological Review*, *88*, 67–85. http://dx.doi.org/10.1037/0033-295X.88.1.67.

King, W., & Dunn, T. (2010). Detecting deception in field settings. *Policing: An International Journal of Police Strategies & Management*, *33*(2), 305–320. http://dx.doi.org/10.1108/13639511011044902

Köhnken, G. (1987). Training police officers to detect deceptive eyewitness statements. Does it work? *Social Behaviour*, *2*, 1–17.

Köhnken, G, Milne, R., Memon, A., & Bull, R. (1999). The cognitive interview: A meta-analysis. *Psychology, Crime & Law*, 5 (1-2), 3-27.

Kraut, R. E. (1980). Humans as lie detectors: Some second thoughts. *Journal of Communication*, *30*, 209–218. http://dx.doi.org/10.1111/j.1460-2466.1980.tb02030.x

Kraut, R. E., & Poe, D. B. (1980). Behavioral roots of person perception: The deception judgments of custom inspectors and laymen. *Journal of Personality and Social Psychology*, *39*(5), 784–798. http://dx.doi.org/10.1037/0022-3514.39.5.784

Masip, J., Sporer, S.L., Garrido, E., & Herrero, C. (2005). Detection of deception with reality monitoring: A critical review. *Psychology, Crime & Law*, *11*(1), 99–122. http://dx.doi.org/10.1080/10683160410001726356

McCormack, T., Ashkar, A., Hunt, A., Chang, E., Silberkleit, G., & Geiselman, R.E. (2009). Indicators of deception in an oral narrative: Which are more reliable? *American Journal of Forensic Psychiatry*, 30, 49-56.

Mortensen, C., & Cialdini, R. (2010). Full-Cycle Social Psychology for Theory and Application. *Social and Personality Psychology Compass*, *4*, 53–63. http://dx.doi.org/10.1111/j.1751-9004.2009.00239.x

Mossman, D. (1994). Assessing predictions of violence: Being accurate about accuracy. *Journal of Consulting and Clinical Psychology*, *62*, 783–792. http://dx.doi.org/10.1037/0022-006X.62.4.783

Moston, S., Stephenson, G. M., & Williamson, T. (1992). The effects of case characteristics on suspect behavior during police questioning. *British Journal of Criminology*, *1*, 23–40.

Robinson, J., & McGuire, J. (2006). Suggestibility and children with mild learning disabilities: The use of the cognitive interview. *Psychology, Crime & Law*, *12*(5), 537–556. http://dx.doi.org/10.1080/10683160500337550

Snook, B., Eastwood, J., Stinson, M., Tedeschini, J., & House, J. C. (2010). Tedeschini, J., & House, J. (2010) Reforming Investigative Interviewing in Canada. *Canadian Journal of Criminology and Criminal Justice*, *52*(2), 215–229. http://dx.doi.org/10.3138/cjccj.52.2.215

Sporer, S. L. (1997). The less travelled road to truth:Verbal cues in deception detection in accounts of fabricated and self-experienced events. *Applied Cognitive Psychology, 11*, 373–397. http://dx.doi.org/10.1002/(SICI)1099-0720(199710)11:5<373::AID-ACP461>3.0.CO;2-0

Sporer, S. L., & Hamilton, S. C. (1996). *Should I believe this? Reality monitoring of invented and self-experienced events from early and late teenage years.* Poster

presented at the NATO Advanced Study Institute. Port de Bourgenay, France, June 1996.

Sporer, S. L., & Kupper, B. (1995). Realita¨tsu¨berwachung und die Beurteilung des Wahrheitsgehaltes von Erza¨hlungen: Eine experimentelle Studie [Reality monitoring and the judgment of credibility of stories: an experimental study]. *Zeitschrift für Sozialpsychologie, 26*, 173–193.

Sporer, S. L., & Schwandt, B. (2002). Nonverbal indicators of deception: A meta-analytic synthesis. Paper presented at the Biennial Meeting of the American Psychology/Law Society in Austin, Texas, March 2002.

Stromwall, L., Hartwig, M., & Granhag, P. (2006) To act truthfully: Nonverbal behaviour and strategies during a police interrogation, *Psychology, Crime & Law*, 12(2): 207/219. doi: 10.1080/10683160512331331328

ten Brinke, L., & Porter, S. (2012). Cry me a river: Identifying the behavioral consequences of extremely high-stakes interpersonal deception. *Law and Human Behavior, 36*, 469–477. http://dx.doi.org/10.1037/h0093929

Vrij, A. (2000). *Detecting lies and deceit: The psychology of lying and the implications for professional practice* Chichester: Wiley

Vrij, A., Akehurst, L., Soukara, S., & Bull, R. (2004). Let me inform you how to tell a convincing story: CBCA and Reality Monitoring scores as a function of age, coaching and deception. *Canadian Journal of Behavioural Science, 36*(2), 113–126. http://dx.doi.org/10.1037/h0087222

Vrij, A., Edward, K., Roberts, K., & Bull, R. (2000). Detecting deceit via analysis of verbal and non-verbal behavior. *Journal of Nonverbal Behavior, 24*(4), 239–263. http://dx.doi.org/10.1023/A:1006610329284

Vrij, A., & Granhag, P. A. (2012). Eliciting cues to deception and truth: What matters are the questions asked. *Journal of Applied Research in Memory and Cognition, 1*, 110–117. http://dx.doi.org/10.1016/j.jarmac.2012.02.004

Vrij, A., Leal, S., Mann, S., Warmelink, L., Granhag, P., & Fisher, R. (2010). Drawing as an Innovative and Successful Lie Detection Tool. *Applied Cognitive Psychology, 24*, 587–594.

Vrij, A., & Mann, S. (2001a). Telling and detecting lies in a high-stake situation: The case of a convicted murderer. *Applied Cognitive Psychology, 15*, 187–203. http://dx.doi.org/10.1002/1099-0720(200103/04)15:2<187::AID-ACP696>3.0.CO;2-A

Vrij, A., & Mann, S. (2001b). Who killed my relative? Police officers' ability to detect real life high-stake lies. *Psychology, Crime & Law, 7*, 119–132. http://dx.doi.org/10.1080/10683160108401791

Vrij, A., Mann, S. A., Fisher, R. P., Leal, S., Milne, R., & Bull, R. (2008). Increasing cognitive load to facilitate lie detection: The benefit of recalling an event in reverse order. *Law and Human Behavior, 32*, 253–265. http://dx.doi.org/10.1007/s10979-007-9103-y

Vrij, A., Mann, S., Kristen, S., & Fisher, R. P. (2007). Cues to deception and ability to detect lies as a function of police interview styles. *Law and Human Behavior*, *31*(5), 499–518. http://dx.doi.org/10.1007/s10979-006-9066-4

Vrij, A., Mann, S., Leal, S., & Fisher, R. (2010). 'Look into my eyes': Can an instruction to maintain eye contact facilitate lie detection? *Psychology, Crime & Law*, *16*(4), 327–348. http://dx.doi.org/10.1080/10683160902740633

Wright, A. M., & Holliday, R. E. (2007). Interviewing cognitively impaired older adults: How useful is a cognitive interview? *Memory,15,*(1), 17–33. http://dx.doi.org/10.1080/09658210601047351

Chapter 3: Catch Me if You Can! Subjective and Actuarial Judgments of Deception in the Context of the Cognitive Interview for Suspects

Abstract

Volumes of research have indicated that deception detection techniques are largely ineffective under controlled experimental conditions. Recent research has moved away from body language cues and accusatory interviews to verbal deception detection methods and interviews that emphasize information gathering. Logue et al. (2015) demonstrated that applying the Reality Monitoring scale to statements elicited through the Cognitive Interview for Suspects (CIS) was highly effective in detecting deception (86.6% overall accuracy; true = 89.9%, false = 83.3%). The current study considers whether the CIS alone allows for third party raters to accurately detect deception, or if Reality Monitoring in conjunction with the CIS is more effective. Three hundred and ninety Brock University students viewed video recordings of the first and last questions of 100 CIS interviews conducted in previous research (Logue et al., 2015) and were asked to judge deceptiveness after each question. These interviews were conducted after participants in a previous study completed a mock theft scenario where money was missing from a wallet, or were instructed to take money from a wallet and construct a convincing lie based on a template provided. In the current study, subjective observer ratings hovered around chance levels of accuracy for both the first (52.73%) and last (47.82%) questions. Subjective ratings of deception were significantly worse after the CIS was completed compared to the initial question ($t(389) = 4.75$, $p < .01$). Conversely the Reality Monitoring scale was extremely effective, with an overall deception detection accuracy of 92.5% (True = 91.7%, False = 93%). Results provide further support for the use of Reality Monitoring and the CIS as an accurate measure of deception detection.

Chapter 3. Study 2.

3.1 Introduction

Lie detection is a topic of theoretical interest and practical importance among law enforcement agencies. Despite numerous volumes of literature on body language cues and interviewing styles, the vast majority of research has observed chance level accuracy for deception detection. In a meta-analysis of 206 samples, Bond and Depaulo (2006) demonstrated a 54% overall accuracy rating with 61% of people correctly classifying truthful statements and only 47% correctly classifying lies. The authors further noted that overall accuracy was normally distributed, ranging between 31-73%. In these studies the outlying positive effect sizes involved small sample sizes, with the larger sample studies hovering around the mean. Perhaps more alarmingly, researchers have argued that accuracy of detecting truth may be over-inflated by the well-established "truth bias" (Levine, Park, & McCormack, 1999; Vrij, 2000). Standard practice in lie detection studies has been to counterbalance truth and lies. Given the natural inclination to believe in a person's honesty, the small but significant increase in classifying truthful statements above chance may be an artifact of cognitive bias, rather than true deception detection (Blair, Levine, Reimer, & McCluskey, 2012). Interviewing experience does not appear to improve accuracy. Numerous studies have indicated that trained law enforcement investigators do not perform appreciably better at detecting deception than the average lay person. Vrij (2008) reviewed 28 studies of professional law enforcement officers (customs, police officers, secret service) and found 56% accuracy rating. Similarly, Aamodt and Custer (2006) found that experts demonstrated lie detection accuracy rates (55.5%) that were comparable to lay persons (54%). Consistent with the finding that

experience does not increase deception detection accuracy, a review of training programs has provided a similarly bleak outlook. Meta-analytic findings suggest that specific lie detection training programs led to an average of 58% accuracy rating, only 4% better than the level observed in lay individuals and through placebo controls (Frank & Feeley, 2003).

One potential reason for the failure of deception detection techniques may be the reliance on physiological and body language cues to deception. There is a long standing historical and cross cultural belief that deception is accompanied by changes in physical states, and many deception detection techniques have been created to measure physiological differences (Vrij, Mann, & Leal, 2013). For example, an ancient Chinese measure of detection involved having the perceived liar chew rice powder and spit it out. Lying was believed to decrease salivation, and if the powder remained dry, the person was deemed to be deceptive (Klienmuntz & Szucko, 1984; Trovillo, 1939). Similarly, modern techniques often operate on the principle that lying causes emotional dysregulation and physiological signs of distress that will be readily observable in deceptive individuals (Vri, Mann, & Leal, 2013). While there is tenuous evidence that liars may have higher pitch (Vrij et al., 2000) and lower hand/foot movements (Sporer & Shwandt, 2002), much of the evidence for body language cues is conflicting. For example, although many theories indicate that liars will demonstrate signs of nervousness including trunk movement and blinking, analysis of tapes of suspect interviews actually demonstrate lower levels of these behaviours among those guilty of arson, rape, and murder (Mann, Vrij, & Bull, 2002). A large scale meta-analysis of 158 body language cues indicated that there is no universally reliable cue to deception and that these cues are

dramatically influenced by context (Depaulo et al., 2003). Interestingly, Depaulo et al., (2003) noted that the more often cues which demonstrated initial significance were studied, the smaller the effect sizes became. Levine (2010) argues that the small effect sizes and inconsistent findings for body language cues can be explained by a few outliers in each study that are easily detected. Vrij, Mann, and Leal (2013) argue that physiological methods are flawed in that both truthful and honest people may be nervous, particularly in cases of direct accusation, such as a police interview.

Police interviewing manuals often stress the importance of physiological or body language cues to deception (King & Dunn, 2010), possibly explaining the lack of increased accuracy by professionals. More recent research has attempted to move beyond often studied behavioural cues such as trunk movement, blinking and gaze, to more sophisticated physiological measures such as the fMRI. Although sophisticated brain imaging may have intuitive appeal for deception detection, it has not been proven to be effective under empirical scrutiny (Vrij, Mann, & Leal, 2013). There are large individual differences in brain activity during deception, and studies have been unable to locate a specific cortical area related to lying (Spence, 2008). As a result of these failures, Vrij, Mann and Leal (2013) have argued for the movement away from physiological methods of deception detection to more effective approaches. Despite numerous challenges and disappointments in the empirical study of deception detection, more modern research approaches have shown increased accuracy. Two major advancements in the study of deception detection are: the use of actuarial measures instead of subjective judgements, and interviewing styles that emphasize information gathering and induce cognitive load.

3.1.1 Actuarial Methods of Deception Detection

Given the limited effectiveness of subjective judgments based on body language cues, more recent research has demonstrated the utility of objective, actuarial scales that assess verbal cues to deceit. Reality Monitoring is an actuarial scale method that focuses on language cues and has reliably shown deception detection above chance levels. Reality Monitoring indicates that truly experienced events are encoded with sensory, temporal, emotional and cognitive details, and these details will be more prevalent in the language used to describe the event. Conversely, fabricated events will not be encoded with such cues, and these details will be less prominent in deceptive stories. This hypothesis was originally proposed by Johnson and Raye (1981) and researchers have adapted these principles to create actuarial measures of deception detection. Reality Monitoring measures: emotion, vividness, coherence, realism, spatial information, sensory information temporal information, and cognitive operations. Higher quantities of verbal details reported in these categories are typically indicative of honesty (Masip, Sporer, Garrido, & Herrero, 2005). However it should be noted that, depending on how cognitive operations is defined, this category may be indicative of deception (Logue et al., 2015; McCormack et al., 2009).

In a series of studies, Reality Monitoring has shown accuracy ratings between 64-71% (Masip et al., 2005). This method has been demonstrated to classify true and false statements among people who recalled or generated stories from various times in the past to even third-party witness statements of a mock theft (Masip et al., 2005; Sporer & Kupper, 1995; Sporer & Hamilton, 1996; Vrij et al., 2000). However, it should be noted that there is debate about the relative importance of each category, and whether more

subjective interpretations such as realism and coherence are required for adequate deception detection. More recent studies have demonstrated comparable levels of success by measuring the amount of visual, auditory, spatial, temporal, affective, and cognitive details reported in each story (Vrij et al., 2000; Vrij et al., 2004, Vrij et al., 2008). The aforementioned Reality Monitoring criteria have the advantage of being concrete, simple to score, and relatively unambiguous. The apparent superiority of Reality Monitoring over subjective ratings of deception is in line with Garb's (1989) meta-analysis, which concludes that actuarial scale measures dramatically outperform subjective judgements in a variety of contexts, and highlight a potential method of objectively detecting deception above chance levels.

3.1.2 Information Gathering Interviews and Cognitive Load

A second major development in deception detection research is the application of interviewing styles that increase the amount of information gathered during the interview. Until recently, the most common method of police interviewing for potential suspects was the Reid Technique (Snook et al., 2010). In the first stage of this method, a general interview is conducted, during which the interviewer uses nonverbal cues to detect deception. If the interviewee is determined to be deceptive, the interview shifts to a nine stage interrogation with the goal of eliciting a confession. This interview involves repeatedly accusing the suspect, providing face-saving motivations that one could admit to and minimizing the seriousness of the alleged offence.

Despite its popularity, researchers have argued that there is no empirical evidence that this method can accurately detect deception or leads to higher rates of confessions

(Snook et al., 2010). Further, others have expressed concerns that minimization of crimes and face-saving alternatives may lead to false confessions (Russano, Meissner, Narchet, & Kassin 2005). In addition to the concerns regarding poor deception detection and false confessions, studies have demonstrated that accusatory interview styles often lead to less information being provided. Vrij, Mann, Kristen and Fisher (2007) observed that accusatory interviews elicited extremely short statements and fewer signs of deceit. Further, Evans et al. (2013) noted that information gathering interviews led to greater disclosure of details and more admissions than accusatory interviews. The concerns regarding a lack of empirical evidence for the utility of the Reid Technique and the potential for false confessions have led researchers to call for the abandonment of accusatory approaches and move towards an information gathering approach to suspect interviewing (Snook et al., 2010).

Perhaps the most effective interviewing techniques for deception detection are information gathering approaches that also increase cognitive load. Vrij, Granhag, Mann and Leal (2011) have argued that lying is more cognitively demanding than telling the truth for many reasons. The liar must invent the story and monitor the details to ensure consistency. The liar must inhibit the truthful narrative and emotional reactions to being questioned to appear honest. While it is argued that most people are so practiced at deception that they are able to manage these tasks under normal conditions, inducing cognitive load through questioning should reduce the resources available for these tasks, and in doing so, decrease the ability to lie effectively. Studies have attempted to induce cognitive load through various methods to exacerbate the differences between truthful and deceptive individuals. For example, Vrij et al. (2008) conducted a study during

which police officers were requested to determine statement veracity after watching a taped interview. Cognitive load was induced by requesting that the storyteller recount the event in reverse order in comparison to the control condition who told the story chronologically. The reverse order condition significantly increased deception detection accuracy (60%) as compared to when interviewees told their stories in chronological order (42%).

Additionally, keeping consistent eye contact has been hypothesized to induce cognitive load and has also been linked to increased deception detection. For instance, Vrij, Leal, Mann and Fisher (2010) found that deceptive people who were directed to maintain eye contact remembered fewer details and were more likely to be correctly classified as deceptive than those who were not. Finally, drawing a scene and describing it in the interview has been successfully used to increase deception detection (Vrij et al., 2010). The authors argue that the unexpected nature of this request and new perspective that this task requires increases cognitive load and aids in deception detection. While it should be noted that cognitive load was not directly tested in these studies, these interventions have been successful in improving deception detection accuracy. Further lines of research have indicated that deceptive individuals take consistently more time to respond to questions. A series of studies demonstrated that deceptive individuals took 230 ms longer to respond to questions (Walzcyk et al., 2003; Walzcyk et al., 2005). While this response time may not allow for accurate human deception detection, it is consistent with Vrij's theory that deception requires more cognitive load, which may be exploited to increase detection. As a result of these findings, Vrij & Granhag (2012) have argued that the empirical literature must move away from passive observation of

ineffective physiological cues to actively eliciting differences between deceptive and truthful individuals by increasing cognitive load.

Converging lines of research have indicated that information gathering interview styles that induce cognitive load may be more effective in eliciting statements that allow for accurate deception detection. One interviewing method that appears to increase information gathered and cognitive load is the Cognitive Interview for Suspects (CIS). Recently, Geiselmann (2012) has adapted the cognitive interview, a police interviewing method that has been used to increase the quantity and accuracy of details provided in witness statements, to suspect interviewing. The CIS has eight stages: (a) rapport building, (b) initial recall of event in question, (c) drawing the scene and explaining the event in chronological order, (d) additional recall, (e) open ended follow-up questions, (f) telling the story backwards, (g) interviewer challenges the story as false and (h) final recall of the event. During the final recall, the interviewee is permitted to make any alterations or additions to the story as required. Geiselmann (2012) demonstrated the effectiveness of the CIS in an initial study of 20 students. According to this paradigm, each participant was requested to tell one true and one false story to trained interviewers, who rated statement veracity after each question. Geiselmann noted that although interviewers were unable to discriminate between true and false stories at the beginning of the interview, they became quite accurate by the conclusion.

Logue et al. (2015) replicated and extended the findings of Geiselman, providing additional support for the effectiveness of the cognitive interview for suspects in deception detection. In this study, the authors argued that the CIS adopts many techniques that have been individually demonstrated to increase deception detection

through cognitive load, such as reverse recall and drawing of the scene. Further, volumes of studies of witness statements have demonstrated that these techniques increase the quantity of information provided without decreasing accuracy (Köhnken, Milne, Memon, & Bull, 1999). Finally, this interview style was argued to lend itself to the use of Reality Monitoring, as it orients the interviewee to visual, audio, spatial and temporal details, specific facets of this scale. Therefore, Logue et al. (2015) argued that the CIS would allow for increased deception detection using the Reality Monitoring scale by eliciting more detailed statements from truthful, not deceptive participants. In this study, the "truthful" participants were involved in an experimental paradigm that culminated in money missing from a wallet. Conversely, the "deceptive" participants read a transcript of the event: They were then directed to take money out of the wallet and use the template to create an alibi. Both participants experienced an interview of pre-determined questions from an interviewer based on Geiselman's CIS. In order to determine if a person was being deceptive, Logue et al. (2015) used facets of the Reality Monitoring scale that have been validated by in previous studies. The results of this study indicated that the Reality Monitoring scale applied to statements elicited by the CIS successfully classified true and false statements in 86.6% of cases (89.9% true, 83.3% false).

3.1.3 The Current Study

3.1.3 (a) Deception Detection Accuracy Using Observer Ratings and Reality Monitoring

While Logue et al. (2015) demonstrated that the combination of Reality Monitoring and the CIS may be used to accurately detect deception, it is important to

determine whether the CIS alone is sufficient for accurate deception detection. Although meta-analyses of the separate literatures have indicated that Reality Monitoring has an overall accuracy rating that is higher than subjective ratings, studies that directly compare Reality Monitoring to observer ratings of the same interviews are relatively scarce. Further, Geiselmann (2012) indicated that subjective ratings of deception at the conclusion of the CIS led to "an almost perfect level of discriminability" (Geiselmann & Fisher, 2014, p.14). While actuarial judgments have been demonstrated to improve deception detection accuracy in a variety of settings, it is conceivable that the additive effects of the cognitive load throughout the CIS may make truth and deception easier to determine subjectively, by merely watching the interviews. The present study attempts to determine whether the CIS alone is able to elicit accurate, subjective judgements, or if Reality Monitoring is required for accurate deception detection. Participants watched videos of CIS interviews that were conducted after the mock theft scenario outlined in Logue et al. (2015). The observer ratings of honesty and deception were compared to Reality Monitoring scales to determine whether it is the specific combination of Reality Monitoring and the CIS that leads to accurate deception detection. Due to the superiority of actuarial methods over subjective judgments in many contexts (Garb, 1989), we expected that Reality Monitoring scores would more accurately predict deception than subjective judgments after watching interrogation videos.

3.1.3 (b) Validating the Cognitive Interview for Suspects as an Information Gathering Approach

Logue et al. (2015) considered the Reality Monitoring scores of the final, post interview questions. In the discussion of this study, the authors hypothesized that true

and false statements may show differential patterns of information throughout the interview that may lead to increased deception detection. Specifically, the interventions of the CIS should increase memory in true statements which would lead to more visual, auditory, spatial, temporal, and affective details at the conclusion of the interview. Conversely, fabricated accounts would not demonstrate this effect and the cognitive load induced by the CIS may actually reduce the information gathered. The present study reanalyzes the data set from Logue et al. (2015) to directly test whether truthful and deceptive accounts differ in the amount of Reality Monitoring criteria mentioned throughout the interview. An additional goal of this study was to directly test if using the pattern of information provided during the interviews is an effective method of detecting deception. Reality Monitoring criteria have been demonstrated to be more prevalent in truthful accounts prior to any information gathering interventions (Masip et al., 2005). The CIS has been hypothesized to preferentially increase the amount of information provided in truthful statements. Therefore, Reality Monitoring scores will be calculated using both the baseline interview response and the pattern of information provided throughout the interview. The specific hypotheses of this paper are:

1.) Reality Monitoring will be a significantly more accurate deception detection method than observer ratings.

2.) Truthful accounts will demonstrate a significantly higher increase in Reality Monitoring criteria from initial to final CIS question responses than deceptive accounts.

3.) Using initial Reality Monitoring scores and the difference scores of the first and last question of the CIS will be an accurate method of detecting deception.

3.2 Method

3.2.1 Participants

Interviews: Participants in the mock theft scenario and interviews were 166 Brock University students (67 men, 99 women, M = 21.3 age range 17-43). These individuals completed the study for course credit and the possibility of winning $10.

Observer raters: Participants in this study were 390 Brock University students (97 men, 293 women, age: *M* = 21.3, *SD* = 1.21). Participants received course credit for completion of this study.

3.2. 2 Procedure

3.2.2 (a) Stage I

Interrogation Videos: The videos that participants viewed were segments from the CIS as completed in Logue et al. (2015). In this study participants were interviewed after experiencing a game manipulation adapted from Vrij, Leal, Mann & Fisher (2010). Participants in the truthful condition of this study completed a game scenario during which they were left alone in a room with a wallet. Eventually, the participant was confronted by a confederate who claimed that money was missing out of the wallet. Conversely, participants in the deceptive condition were provided a transcript of the game protocol and directed to take the money out of the wallet. They were directed to use the template provided to come up with a convincing lie and given equivalent time to practice it. Participants in both conditions were informed that they would win/keep the money if they were able to convince the interviewer that they did not take the money.

Participants in both groups were interviewed using the CIS. The videos that the participants in this study observed depicted the interviewee sitting in a chair, facing the camera, which was clearly in sight. The video was shot from a "first person perspective" over the right shoulder of the interviewer, so that the interviewer was not in the frame. The camera was approximately 5 feet away from the interviewee and was adjusted to each participant's height to provide a clear view of the interviewee's face, arms, and body below the knee.

One hundred videos were selected from 157 interviews that were obtained in previous research. These 100 videos were selected based on length of answers, so that participants could watch 10 different interviewee's answer two questions during the allotted time frame. The selection pool was limited to answers that were a maximum of 3 minutes including the initial question asked by the interviewer. Videos of the first question were between 1:04 and 2:48 minutes. Videos of the second question ranged between 1:21 and 2:57 minutes. Only 38 of the original 77 truthful answers were less than 3 minutes, and therefore only these videos were used in this sample. The 62 deceptive answers were randomly selected out of the original pool of deceptive answers that fit the time restrictions to be used in this study.

3.2.2 (b) Stage II

Participants were informed that this study involved how people make social judgments. Study sessions were run with groups of one to eight people. Participants selected their own timeslots on a university website. Each participant viewed the answers to the first and last question asked during the interview, so that they viewed an

interviewee answer 2 questions, for a total of 20 videos watched. The order of video targets was counterbalanced to eliminate practice effects. Approximately 40 participants viewed each set of video targets (in groups of 10 targets). Thus, each participant viewed and rated 20 videos (10 first question videos, and 10 last question videos). Accuracy was defined as the number of targets correctly classified by each participant, separately for the first and last question videos.

The first question that each interviewee responded to was:

"Please tell me in as much detail as possible, what happened when you were in the room with [Researcher 1] just now. Please mention all details, all conversations that took place, and give as much information as possible, including everyone whom entered the room, however irrelevant it may seem. Please tell me as much as you possibly can, as I will use all the information to decide whether or not I think you are telling the truth."

This question served as the initial recall of the event, prior to the CIS.

The second question each interviewee responded to was:

"Please tell me in as much detail as possible, what happened when you were in the room with [Researcher 1] just now. Please mention all details, all conversations that took place, and give as much information as possible, including everyone whom entered the room, however irrelevant it may seem. Please tell me as much as you possibly can, as I will use all the information to decide whether or not I think you are telling the truth. It is very important that you tell me all of the information you have told me throughout the interview, even if you have mentioned it in previous questions, as well as anything else

you may like to add. This will be your last chance to convince me you are telling the truth."

This question was the last question in the CIS protocol, which was asked after all of the CIS steps were completed. The interviewer was not allowed to direct, challenge, or ask any further questions of the interviewee. The videos were the full and complete uninterrupted statements of the interviewee. All parties watched the videos on a large projection screen. At the conclusion of each clip, participants were asked to make judgements on the truthfulness of each answer. Participants rated each video both after the initial control question, and on the final question of each interview. Participants were separated and judged truthfulness individually. A researcher remained in the study room to ensure independent answers.

3.2.3 Scoring Criteria

Observer Ratings: Participants were requested to subjectively rate deception after watching each question in the interview two separate ways. Participants were first asked to decide whether the interviewee was being deceptive by circling T (*truthful*) or D (*deceptive*). This categorical measure served as a measure of accuracy. Additionally, participants also rated the deceptiveness of each participant after each answer on a 1 (*very untruthful*) to 6 (*very truthful*) Likert scale to provide a dimensional measure of accuracy.

Qualitative Data: After watching all 20 video clips, participants were asked to provide researchers with the criteria by which they chose to judge truthfulness. This was completed using an open-ended question format, so that researchers could understand general strategies that participants used to make decisions.

Reality Monitoring: In addition to the subjective judgments provided by participants, the accuracy after viewing the final question of each scale was compared to the Reality Monitoring score obtained on the sample of targets (Logue et al., 2015). Scoring was conducted by a separate researcher, blind to experimental condition. The researcher scored both the first and the final interview question based on 6 Reality Monitoring criteria: visual, spatial, auditory, temporal, affective, and cognitive details. Scoring consisted of a simple frequency tally of each facet of the scale. For example, the statement: "She took her black coat off and hung it on the chair to the left. Then she sat down and placed a red book between us on the table" would score higher on Reality Monitoring than the statement "She came into the room and we played the game". The Reality Monitoring criteria used in this study are concrete, reliable, and simple to score, with little room for interpretation. It should be noted that in this study cognitive operations refers to inferred mental states of others, rather than one's own thoughts. There is a debate in the literature regarding the classification of cognitive operations in RM. The authors adopt the viewpoint as espoused by McCormack et al. (2009) that fabricating a story may involve creating a narrative of the actions of others to create a more believable story. Numerous researchers have noted that deceptive individuals often attempt to "fill in the gaps" in the story by providing motivations that would not be known to them. For example the statement "She was worried about her test coming up, so she was off her game," would indicate deception. Full scoring procedure and rationale can be found in Logue et al. (2015).

It is hypothesized that truthful participants will provide higher RM criteria during initial questioning and the amount of RM details should increase by the conclusion of the

CIS. Conversely, the CIS should not increase the details of false accounts. Therefore, the pattern of information provided throughout the interview in combination with the original, pre-CIS scores may provide a more accurate measure of deception detection. In order to test this theory, the difference scores of the first and last questions of the CIS were calculated and included in the model in conjunction with the original RM scores after the first question of the CIS. Accuracy was calculated using the full data set of Logue et al. (2015) to determine the overall effectiveness of this method, and the subset of interviews that were rated by observers to provide a direct comparison of effectiveness.

3.3 Results

3.3.1 Observer judgements of deception

Dimensional Measures of Deception: Although participants in this study provided subjective judgements on 100 interviews, seven of these cases had missing data in subjective ratings making them unsuitable for analysis. Ninety three of the original 100 cases were included in the analysis. Of those cases, 36 were truthful and 57 were deceptive.

A binary logistic regression was conducted to determine whether the average dimensional ratings of truthfulness were predictive of deception/truth of the target. Average ratings of truthfulness of each video were not significantly related to deception/truth of the target $\lambda = .996$, $\chi 2$ (2) =.381, $p = .83$. The canonical correlation was extremely low ($r =. 064$). It is important to note that while the model correctly classified

60% of cases in their original group, this is reflective of the ratio of truthful and deceptive interviews and indicates a chance level of accuracy, which was 61.3% due to the inequality of group numbers. These results indicate that subjective ratings of deceptiveness whether pre- or post- CIS were not predictive of condition.

Accuracy of Subjective Judgments of Deception: an additional hypothesis under examination in this study was whether participants were more accurate in detecting deception after the completion of the CIS compared to baseline. In order to determine whether participants could accurately detect deception, their categorical ratings of 10 videos were averaged to provide an overall accuracy percentage for both the first and the last question of the CIS. Participants demonstrated poor deception detection after viewing both the initial (M= 52.73%, SD = 16.41%) and final question of the CIS (M = 47.82%, SD = 17.38%). A t-test indicated that participants were actually significantly worse at detecting deception after viewing the final CIS question than the initial control question ($t(389) = 4.75$, $p < .01$). These results are in contrast to Geiselman's (2012) initial study, which found that detection increased throughout the interview from chance level to "an almost perfect level of discriminability" (p. 14).

Qualitative Data: Three hundred and sixty three of the 390 observers provided qualitative data regarding the criteria they used to determine whether an interviewee was being honest or deceptive. While a detailed analysis of the specific criteria used is beyond the scope of this paper, these results may provide some insight into the general strategies that observers used. References to non-verbal cues were common, with 300 of the 363 (82.6%) of participants making reference to cues such as smiling, hand/foot gestures, and eye contact as indicators of honesty or deception. Observers also

considered the consistency of answers of both questions. One hundred and sixty-four observers (45.2%) referenced consistency between answers as a measure of honesty and inconsistent stories as an indicator of deception.

3.3.2 Reality Monitoring

Overall Sample Accuracy: A binary logistic regression was conducted with the initial CIS and difference scores included in the model for the overall original sample of 157 cases (78 truthful, 79 deceptive). The model was significant, $\chi 2$ (12) =137.73, $p <$ .01 with a large effect size (Nagelkirke $R^2 = .78$). The overall accuracy of RM when the initial CIS and difference scores are included in the model was 88.5% with the scale correctly classifying 87.3% of deceptive cases and 89.7% of truthful cases (see Tables 3.1 & 3.2 for model statistics and accuracy). This finding supports the use of difference scores in combination with initial CIS scores to improve the accuracy of the RM scale.

The Cognitive Interview for Suspects as an Information Gathering Interview: An additional hypothesis under examination is whether the CIS does in fact increase the amount of details provided at the conclusion of the interview in comparison to the first baseline question. A series of paired-sampled t-tests were conducted to determine whether the CIS is an effective information gathering interview. As predicted, regardless of condition, participants reported significantly more details at the conclusion of the CIS. Specifically, participants reported more visual t(156) = 6.02, $p < .01$, auditory t(156) = 7.75, $p < .01$, spatial t(156) = 8.01, $p < .01$, temporal t(156) = 7.82, $p < .01$, and total RM facet details t(156) = 10.47, $p < .01$ at the conclusion of the CIS. Cognitive t(156) = -.80, $p = .42$ and affective details t(156) = .41, $p = .68$ did not significantly

increase throughout the CIS. Cohen's *d* indicates a small effect for visual details, a medium effect for auditory, spatial and temporal details, and a large effect for total details. These results indicate that the Cognitive Interview for Suspects is an effective information gathering interview that may increase the accuracy of Reality Monitoring by improving the amount of information gathered (means and descriptive statistics provided in Table 3.3).

While the CIS has been demonstrated to increase the amount of Reality Monitoring details provided, a hypothesis under examination in this paper is that truthful participants will demonstrate a greater increase in Reality Monitoring details provided at the conclusion of the interview than deceptive participants. A series of independent *t*-tests were conducted on the differences scores of the first and last questions of the CIS (means and descriptive statistics found in Table 3.4). As predicted participants in the truthful condition demonstrated a significantly higher increase in the amount of information provided at the conclusion of the interview than deceptive participants. Specifically truthful participants demonstrated a significantly greater increase in auditory $t(155) = 5.64$, $p < .01$, temporal $t(155) = 2.77$, $p = .01$ affective $t(155) = 2.73$, $p = .01$ and total details $t(155) = 4.98$, $p < .01$. Visual details were also marginally significant $t(155) = 1.85$, $p = .07$. There were no significant differences in the difference scores of truthful and deceptive participants in spatial $t(155) = 1.28$, $p = .20$ and cognitive details $t(155) = .01$, $p = .99$ provided. Cohen's d indicates a small effect for visual, spatial, temporal, and affective details, and a large effect for auditory and total details. Collectively, truthful participants demonstrate a greater relative increase by the conclusion of the interview in compared to deceptive. However, it should be noted that

deceptive individuals also provided more details at the conclusion of the interview in comparison to baseline. Specifically, truthful participants provided 12.23 more details in the last question in comparison to initial questioning. In comparison, deceptive individuals provided 4.51 more Reality Monitoring details in the response to the final question than the initial response.

3.3.3 Observer Ratings and Reality Monitoring

Given that initial responses and difference scores produced a high degree of accuracy of Reality Monitoring, this method was applied to the same 93 interviews that were subjectively rated to provide a direct comparison of effectiveness. Of those 93 cases, 36 were truthful and 57 were deceptive. A binary logistic regression was conducted to determine whether Reality Monitoring scores added significant predictive utility to the subjective judgments. Subjective judgments (first and last CIS responses) were entered in Block 1 (see results from subjective scores above), and Reality Monitoring scores (first CIS and difference between first CIS and last-CIS response) were entered in Block 2. The results indicated that the overall model was significant $\chi 2$ (14) = 90.41, $p < .01$ and explained 84% of the variance (Nagelkirke $R^2 = .844$). Further, the addition of the RM scores led to a 92.5% overall accuracy, with the model correctly classifying 91.7% of true cases and 93% of false cases (see Tables 3.5 & 3.6 for accuracy and model).

3.4 Discussion

The results of this study indicate that Reality Monitoring was more accurate than subjective judgment in detecting deception in the same interviews conducted using the Cognitive Interview for Suspects. Observer ratings of deception hovered around chance both in initial accounts and the final retelling of the story after all of the steps of the CIS. Interestingly, participants' subjective judgments of accuracy were actually significantly worse after seeing both interviews. Reality Monitoring scores increased accuracy levels to 92.5% (91.7% true, 93% false) indicating that the scale increased the ability to detect deception over and above observer ratings. This study confirms the importance of actuarial scales over subjective judgment in deception detection.

An interesting finding in this study is that, while subjective judgments were poor both in the baseline question and after completing the CIS, they were significantly worse when judging the answer after completing the CIS. This study is somewhat unique in that it requires the rater to make CIS judgements of deception for the first and last questions of the CIS, in contrast to the majority of the literature, which requires a single rating. The qualitative data may provide some insight into the reasoning behind these judgments. Numerous participants mentioned body language cues such as eye contact, fidgeting, and body posture that have not been linked to accurate deception detection (Depaulo et al., 2003). While these cues may have led to poor deception accuracy in both questions, it does not clearly explain why participants would be significantly worse at judging deception after completing the CIS. Interestingly, many participants (45.2%) mentioned consistency as a determining factor in deception detection with consistent stories being a measure of honesty and inconsistencies signaling deception. The current

experimental design lends itself to using consistency, as it involves rating two recollections of the event. Despite its intuitive appeal, numerous studies have demonstrated that consistency is not a strong predictor of deception. Granhag and Stromwall (2002) conducted a study during which police officers repeatedly questioned a suspect regarding a single incident, and the officers were directed to rate the consistency and coherence of the statement. There was no perceived difference in the consistency and coherence of deceptive and honest individuals in this sample. Stromwall, Granhag, and Jonsson (2003) conducted a similar study using lying pairs and observed that deceptive partners told stories that were rated to be more consistent than honest individuals. Raters in this study reported using consistency of stories between partners as a measure of honesty. Blair et al. (2012) argue that consistency of stories, both within the same individual and across suspects, is an ineffective and often misleading cue. Suspects who have time to practice their stories often do not demonstrate inconsistencies and may be more consistent than honest individuals. In fact, methods of verbal deception detection often indicate that revising one's story is a measure of honesty rather than deception. Raskin and Esplin (1991) argue that deceptive individuals are motivated to appear believable and honest individuals are motivated to tell a full and accurate story. Deceptive individuals are therefore less likely to admit that they do not recall portions of an event, and honest people are more likely to spontaneously correct answers they have given in an effort to provide the full truth, rather than appear honest. Reality Monitoring considers the amount of information provided at the conclusion of the interview, without prejudice to corrections or additions to the story. Thus two of the potential benefits of

using Reality Monitoring over subjective cues are the elimination of body language cues and judgements of statement consistency.

It should be noted that the finding that participants got significantly worse after viewing the final CIS recounting of the event is directly in contrast to Geiselman's (2012) original results. Geiselman noted that interviewers' subjective ratings increased from chance level to near perfection. Procedural differences between these studies may explain the contrasting findings. First, Geiselmann allowed the interviewers to judge deception. These interviewers actively participated in the entire interview and were able to direct the questioning as they saw fit throughout the process. Conversely, in this study, participants were only able to passively view the baseline and completed version of the CIS. While being able to actively participate in the interview may be seen as an advantage, the literature is conflicting as to whether this has an effect on accuracy. Numerous studies have demonstrated that professionals who actively participate in interviews do not perform better than those who passively watch videos. However, recently, Dando and Bull (2011) demonstrated increased deception detection accuracy among police officers who conducted a series of interviews. In this study, the police officers were allowed to present conflicting evidence they were privy to throughout the interview. This sample of police officers were able to accurately classify truth (74%) and deceit (67%) above chance levels. The present study purposely chose to use uninterrupted videotaped statements to ensure internal consistency throughout the tapes. Allowing the interviewer the latitude to control the process may have led to differential questioning that could have influenced judgments. It is important to determine whether the CIS process itself allows for accurate discrimination between truth and lies, rather

than relying on varied skills and expertise of the interviewer. While it should be noted that studies have begun to demonstrate that proper interviewing techniques may allow for involved interviewers to detect deception, the current study indicates that subjective ratings from third party observers hover around chance. This finding, in conjunction with Logue et al.'s (2015) finding that Reality Monitoring was able to accurately detect deception under controlled experimental conditions lend support to the use of actuarial scales over subjective judgments.

In comparison to observer ratings, the Reality Monitoring scale was more accurate in detecting deception. This study confirms the effectiveness of the specific combination of Reality Monitoring and the CIS as originally presented in Logue et al. (2015). This study also provides direct evidence that the CIS is an effective information gathering approach that increases the information obtained in truthful stories. The results of this study indicated that truthful participants provided an average of 12.23 more Reality Monitoring details at the conclusion of the interview than the beginning. This is in contrast to deceptive accounts which led to an average increase in 4.51 details. These results are in agreement with the hypothesis that the CIS will orient individuals to specific facets of the Reality Monitoring scale and that true accounts will become more detailed at the conclusion of the interview. Interestingly, the false stories did lead to some increase in details at the conclusion of the interview, which is in contrast to the hypothesis that the increased cognitive load experienced during the CIS would decrease the amount of information provided by the conclusion of the interview. The methodology of this study may explain why deceptive individuals did not demonstrate a decrease in information provided. This study was designed as a strict test of the CIS

under controlled experimental conditions. Participants in the deceptive condition met the confederate researchers, sat in the same room, and were provided a template of the sequence of events in the mock theft protocol. These steps were necessary to ensure that participants in the deceptive condition were able to tell consistent stories and provide relatively uniform information in order to ensure study integrity. However, this step provided deceptive individuals visual, spatial, and temporal details that they could draw on during the CIS. Considering the deceptive individuals actually met the confederate researchers and sat in the experimental room, the CIS may have elicited some true memories that they were able to recount during the interview. Notwithstanding this advantage, Reality Monitoring was able to accurately distinguish between true and false stories with a 92.5% accuracy rating. This study demonstrates that Reality Monitoring is able to accurately distinguish between true and false statements under controlled conditions, and when many shared cues are provided.

A further unique finding of this study is the demonstration that difference scores of RM first and last CIS responses accurately predict deception. The use of difference scores may assist in developing a deception detection protocol within specific individuals. While large group studies may indicate that overall people who are telling the truth express more visual, auditory, spatial, temporal and affective details, and may demonstrate significantly less cognitive details, these are large group tendencies that may not be directly applicable to certain individuals. Specifically, Reality Monitoring may falsely classify honest people who have a general pattern of speaking less as deceptive. Focusing on the pattern of information provided rather than absolute information may

provide a method of increased accuracy, and may serve to provide an accurate measure of deception for an individual statement.

3.4.1 Limitations and Future Directions

The current study demonstrates that Reality Monitoring is more effective than subjective judgments based on third party raters at detecting deception under controlled experimental conditions. As previously stated, certain studies have found an increase in deception detection accuracy when the subjective rater is actively participating in the interview. While the current paradigm allows for strict empirical control, further research should provide a direct comparison between the Reality Monitoring scale and subjective ratings of active participants to determine which method is better at detecting deception.

While Reality Monitoring is an effective actuarial scale that has been demonstrated to work effectively with the CIS to detect deception, other scales have been created and are actively used in the research literature. Criteria Based Content Analysis (CBCA) is an alternative scale measure that has been demonstrated to detect deception at above chance levels. Meta-analysis reveals that this method has comparable accuracy to RM (Masip et al., 2005). Reality Monitoring was used in this sample as it is a simpler scale which leaves less room for interpretation, and has been used in volumes of previous research (Sporer, 1997; Vrij et al., 2004). Further, Vrij noted that Reality Monitoring was more accurate than the CBCA using similar methodology (Vrij et al., 2004). Despite the perceived advantages of Reality Monitoring, the CBCA is an important tool that may also be highly effective in determining deception. Future research should compare

Reality Monitoring and the CBCA to determine which scale is more effective at detecting deception on statements elicited by the CIS.

Finally, while Reality Monitoring has proven to be a highly effective deception detection scale that can reliably distinguish between true and false accounts elicited by the CIS, the present study considers large group averages. Future research should determine whether this protocol is effective in cases across individual differences. As previously stated, the use of difference scores rather than overall information provided may provide increased accuracy for individuals who provide less information. Consistent with this argument, the Cognitive Interview has been demonstrated to increase the quantity of details provided in a variety of populations. Brown and Geiselmann (1990) demonstrated that the Cognitive Interview increased recall among people with mild intellectual disabilities. Wright and Holliday (2007) confirmed these findings in an elderly population. While converging lines of research indicate that the CIS should lead to increased information provided in a variety of populations, further research must confirm this theory. Furthermore, deception detection research is fundamentally different from the original Cognitive Interview in that participants are actively trying to deceive the interviewer. Certain personality traits such as psychopathy and social dominance have been linked to an increased propensity and ability to deceive others. Now that Reality Monitoring has been established as an effective measure of deception detection, future research should consider characteristics of the deceiver to determine whether Reality Monitoring is effective at detecting deception regardless of personality traits of the interviewee.

Table 3.1

Binary logistic regression using difference scores in full sample.

	Predicted condition		**Total Percentage correct**
Condition	True	False	
True	70	8	89.7%
False	10	69	87.3%
Total			88.5%

Note. N = 157.

Table 3.2

Full sample binary logistic model

	B	SE	Wald	Df	Exp (b)	Significance
Question 1 RM score						
Visual	0.47	0.21	5.29	1	1.60	.02*
Auditory	-0.60	0.13	23.26	1	0.55	<.01**
Spatial	-0.69	0.28	6.02	1	0.50	.01*
Temporal	0.19	0.20	0.89	1	1.21	.35
Cognitive	1.39	0.50	7.77	1	4.01	.01*
Affective	1.11	0.63	3.14	1	3.03	.08
Difference Score Q5-Q1						
Visual	0.17	0.13	1.64	1	1.19	.20
Auditory	-0.31	0.09	13.20	1	0.73	<.01**
Spatial	-0.14	0.16	0.80	1	0.87	.37
Temporal	0.02	0.16	0.01	1	1.02	.92
Cognitive	0.40	0.40	1.01	1	1.49	.31
Affective	-0.22	0.56	0.15	1	0.80	.70

Note. N = 157

Table 3.3

Paired t-tests of Reality Monitoring details provided pre and post-CIS.

	Question 1		**Question 5**				
	Mean	Standard Deviation	Mean	Standard Deviation	t-test	Cohen's d	p-value
Visual	5.68	2.61	7.04	3.45	6.02	0.48	<.01**
Auditory	7.89	5.57	11.21	8.37	7.75	0.62	<.01**
Spatial	6.42	2.43	8.29	2.99	8.01	0.64	<.01**
Temporal	9.04	3.20	10.92	3.70	7.82	0.62	<.01**
Cognitive	0.50	1.19	0.58	1.49	-0.80	0.06	.42
Affective	0.29	0.65	0.27	0.72	0.41	0.04	.68
Total	29.83	10.62	38.3	14.78	10.47	0.84	<.01**

Note. N = 157 (78 truthful, 79 deceptive).

Table 3.4

T-tests comparing truthful and deceptive Reality Monitoring details using difference scores

	Truthful		**Deceptive**				
	Mean	Stand Dev	Mean	Stand Dev	t-test	Cohen's d	p-value
Visual	1.78	3.12	0.95	2.47	1.85	0.30	.07
Audio	5.54	6.46	1.13	2.57	5.64	0.90	<.01**
Spatial	2.17	2.90	1.57	2.93	1.28	0.21	.20
Temporal	2.53	3.39	1.23	2.41	2.77	0.44	.01*
Cognitive	0.08	0.66	0.08	1.55	0.01	0.00	.99
Affective	0.14	0.77	-0.19	0.75	2.73	0.43	.01*
Total	12.23	11.46	4.51	6.92	4.98	0.82	<.01**

Note. N = 157 (78 truthful, 79 deceptive).

Table 3.5

Binary logistic regression using difference scores in current sample.

	Predicted condition		**Total Percentage correct**
Condition	True	False	
True	33	3	91.7%
False	4	53	93%
Total			92.5%

Note. N = 93

Table 3.6

Binary logistic regression including observer ratings and difference scores.

	B	SE	Wald	Df	Exp (b)	Significance
Observer ratings						
Q1	0.80	1.05	.58	1	2.23	.45
Q5	-0.06	2.06	.00	1	0.94	.98
RM score: Q1						
Visual	-0.65	0.51	1.64	1	0.52	.20
Auditory	0.87	0.26	10.69	1	2.37	<.01**
Spatial	0.93	0.59	2.50	1	2.52	.11
Temporal	-0.18	0.27	0.45	1	0.84	.50
Cognitive	-18.55	4163.78	0.00	1	0.00	.99
Affective	-23.02	6451.70	0.00	1	0.00	.99
Difference in RM (Q1 to Q5)						
Visual	0.00	0.42	0.00	1	1.00	.99
Auditory	0.21	0.13	2.51	1	1.23	.11
Spatial	-0.50	0.40	1.60	1	0.61	.21
Temporal	0.12	0.28	0.17	1	1.12	.68
Cognitive	0.39	1.03	0.14	1	1.47	.71
Affective	-1.45	3.35	0.19	1	0.23	.66

Note. N = 93

3.5 References

Aamodt, M. G., & Custer, H. (2006). Who can best catch a liar? A meta-analysis of individual differences in detecting deception. *The Forensic Examiner,* 25, 6–11.

Bond, C., & DePaulo, B. (2006). Accuracy of deception judgments. *Personality and Social Psychology Review*, 10(3), 214-234. doi:10.1207/s15327957pspr1003_2.

Blair, J. P., Levine, T. R., Reimer, T. O., & McCluskey, J. D. (2012). The gap between reality and research. *Policing: An International Journal of Police Strategies & Management, 35*(4), 723-740. doi:10.1108/13639511211275553.

Brown, C. L. & Geiselman, R. E. (1990). Eyewitness testimony of mentally retarded: Effect of the cognitive interview. *Journal of Police and Criminal Psychology, 6,* 14-22.

Buller, D.B.,& Burgoon, ,J.K. (1996).Interpersonal deception theory. *Communication Theory*, 6, 203-242.

Dando, C. J., & Bull, R. (2011). Maximizing opportunities to detect verbal deception: Training police officers to interview tactically. *Journal of Investigative Psychology and Offender Profiling,* 8, 189–202. http://dx.doi.org/10.1002/jip.145

DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenbruck, L., Charlton,K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin,* 129, 74–118. http://dx.doi.org/10.1037/0033-2909.129.1.74

Clarke, J., Prescott, K., & Milne, R. (2013). How effective is the cognitive interview when used with adults with intellectual disabilities specifically with conversation recall? *Journal of Applied Research in Intellectual Disabilities,* 26(6), 546-556. doi:10.1111/jar.12049.

Evans, J. R., Meissner, C., Ross, A., Houston, K., Russano, B., & Horgan, A. (2013). Obtaining guilty knowledge in human intelligence interrogations: Comparing accusatorial and information-gathering approaches with a novel experimental paradigm. *Journal of Applied Research in Memory & Cognition,* 2, 83–88. http://dx.doi.org/10.1016/j.jarmac.2013.03.002

Frank, M. G., & Feeley, T. H. (2003). To catch a liar: Challenges in research for lie detection training. *Journal of Applied Communication Research,* 31, 58-75.

Garb, H. N. (1989). Clinical judgment, clinical training, and professional experience. *Psychological Bulletin, 105,* 387–396. http://dx.doi.org/10.1037/0033-2909.105.3.387.

Geiselman, R. E. (2012). The cognitive interview for suspects. *American Journal of Forensic Psychology,* 30, 1–16.

Granhag, P. A., & Strömwall, L. A. (2002). Repeated interrogations: Verbal and non verbal cues to deception. *Applied Cognitive Psychology,* 16(3), 243-257. doi:10.1002/acp.784

Johnson, M. K., & Raye, C. L. (1981). Reality monitoring. *Psychological Review*, 88, 67–85. http://dx.doi.org/10.1037/0033-295X.88.1.67.

King, W., & Dunn, T. (2010). Detecting deception in field settings. *Policing: An International Journal of Police Studies and Management, 33,* 305–320. http://dx.doi.org/10.1108/13639511011044902.

Kleinmuntz B, & Szucko JJ (1984) Lie detection in ancient and modern times: a call for contemporary scientific study. *American Psychologist,* 39, 766–776.

Köhnken, G, Milne, R., Memon, A., & Bull, R. (1999). The cognitive interview: A meta-analysis. *Psychology, Crime & Law, 5*(1–2), 3–27. http://dx.doi.org/10.1080/10683169908414991

Levine, T.R. (2010), "A few transparent liars", in Soloman, C. (Ed.), *Communication Yearbook.* Sage, Thousand Oaks, CA.

Levine, T. R., Park, H. S., & McCornack, S. A. (1999). Accuracy in detecting truths and lies: Documenting the "veracity effect". *Communication Monographs,* 66, 125–144.

Logue, M., Book, A. S., Frosina, P., Huizinga, T., Amos, S., Logue, M., Amos, S. (2015). Using reality monitoring to improve deception detection in the context of the cognitive interview for suspects. *Law and Human Behavior, 39*(4), 360-367. doi:10.1037/lhb0000127

Mann, S., Vrij, A., & Bull, R. (2002). Suspects, lies, and videotape: an analysis of authentic high-stake liars. *Law and Human Behavior,* 26(3), 365-376.

Masip, J., Sporer, S., Garrido, E., & Herrero, C. (2005). The detection of deception with the reality monitoring approach: A review of the empirical evidence. *Psychology, Crime & Law*, 11, 99–122. http://dx.doi.org/10.1080/10683160410001726356

McCormack, T., Ashkar, A., Hunt, A., Chang, E., Silberkleit, G., & Geiselman, R. E. (2009). Indicators of deception in an oral narrative: Which are more reliable? *The American Journal of Forensic Psychiatry,* 30, 49–56.

Moston, S., Stephenson, G. M., & Williamson, T. (1992). The effects of case chara cteristics on suspect behavior during police questioning. *British Journal of Criminology*, 1, 23–40.

Raskin,D.C., & Esplin, P.W. (1991).Statement Validity Assessment: Interview procedure and content analysis of children's statements of sexual abuse. *Behavioural Assessment*, 13 (3), 265–291.

Russano, M, B., Meissner, C.A., Narchet, F., & and Kassin, S. (2005). Investigating true and false confessions within a novel experimental paradigm. *Psychological Science*, 16, 481–486.

Snook, B., Eastwood, J., Stinson, M., Tedeschini, J., & House, J. C. (2010).Reforming investigative interviewing in Canada. *Canadian Journal of Criminology and Criminal Justice*, 52, 215–229. http://dx.doi.org/10.3138/cjccj.52.2.215.

Spence, S. (2008). Playing devil's advocate: the case against fMRI lie detection. Leg Criminol Psychol 13,11–26.

Sporer, S. L. (1997). The less travelled road to truth: Verbal cues in deception detection in accounts of fabricated and self-experienced events. *Applied Cognitive Psychology, 11,* 373–397. http://dx.doi.org/10.1002/(SICI)1099-0720(199710)11:5_373::AID-ACP461_3.0.CO;2-0

Sporer, S. L., & Hamilton, S. C. (1996, June). Should I believe this? Reality monitoring of invented and self-experienced events from early and lateteenage years. Poster presented at the NATO Advanced Study Institute.Port de Bourgenay, France.

Sporer, S. L., & Kupper, B. (1995). Realita¨ tsu¨ berwachung und die Beurteilung des Wahrheitsgehaltes von Erza¨ hlungen: Eine experimentelle Studie [Reality monitoring and the judgment of credibility ofstories: An experimental study]. Zeitschrift für Sozialpsychologie, 26, 173–193.

Sporer, S. L., & Schwandt, B. (2002, March). *Nonverbal indicators ofdeception: A meta-analytic synthesis*. Paper presented at the Biennial Meeting of the American Psychology/Law Society in Austin, TX.

Stromwall, L.A., Granhag, P.A. & Jonsson, A. (2003). "Deception among pairs: 'Let's say we had lunch and hope they will swallow it!'", *Psychology Crime & Law*, 9, 109-124.

Trovillo, P.V. (1939) A history of lie detection. *J Crim Law Criminol* 29, 848–881.

Vrij, A. (2000). Detecting lies and deceit: The psychology of lying and implications for professional practice. Chichester: John Wiley & Sons.

Vrij, A. (2008). Detecting lies and deceit: Pitfalls and opportunities (2nd ed.). Chichester, UK: Wiley.

Vrij, A., Akehurst, L., Soukara, S., & Bull, R. (2004). Let me inform you how to tell a convincing story: CBCA and Reality Monitoring scores as a function of age, coaching and deception. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*, 36,113–126. http://dx.doi.org/10.1037/h0087222

Vrij, A., Edward, K., Roberts, K., & Bull, R. (2000). Detecting deceit via analysis of verbal and non-verbal behavior. *Journal of Nonverbal Behavior*, 24, 239–263. http://dx.doi.org/10.1023/A:1006610329284

Vrij, A., & Granhag, P. A. (2012). Eliciting cues to deception and truth:What matters are the questions asked. *Journal of Applied Research in Memory & Cognition*, 1, 110–117. http://dx.doi.org/10.1016/j.jarmac.2012.02.004

Vrij, A., Leal, S., Mann, S., Warmelink, L., Granhag, P., & Fisher, R.(2010). Drawing as an innovative and successful lie detection tool. *Applied Cognitive Psychology*, 24, 587–594.

Vrij, A., & Mann, S. (2001a). Telling and detecting lies in a high-stake situation: The case of a convicted murderer. *Applied Cognitive Psychology*,15, 187–203. http://dx.doi.org/10.1002/1099-0720(200103/04)15:2187::AID-ACP6963.0.CO;2-A

Vrij, A., & Mann, S. (2001b). Who killed my relative? Police officers'ability to detect real life high-stake lies. *Psychology, Crime & Law*, 7,119–132. http://dx.doi.org/10.1080/10683160108401791

Vrij, A., Mann, S. A., Fisher, R. P., Leal, S., Milne, R., & Bull, R. (2008). Increasing cognitive load to facilitate lie detection: The benefit of recalling an event in reverse order. *Law and Human Behavior*, 32, 253–265. http://dx.doi.org/10.1007/s10979-007-9103-y

Vrij, A., Mann, S., Kristen, S., & Fisher, R. P. (2007). Cues to deception and ability to detect lies as a function of police interview styles. *Law and Human Behavior*, 31, 499–518. http://dx.doi.org/10.1007/s10979-006-9066-4.

Vrij, A., Mann, S., & Leal, S. (2013). Deception traits in psychological interviewing. *Journal of Police and Criminal Psychology*, 28,(2), 115-126. doi:10.1007/s11896-013-9125-y.

Vrij, A., Mann, S., Leal, S., & Fisher, R. (2010). Look into my eyes': Can an instruction to maintain eye contact facilitate lie detection? *Psychology, Crime & Law*, 16, 327–348. http://dx.doi.org/10.1080/10683160902740633

Walczyk, J. J., Roper, K. S., Seeman, E., & Humphrey, A. M. (2003). Cognitive mechanisms underlying lying to questions: Response time as a cue to deception. *Applied Cognitive Psychology*, 17, 755–774. doi:10.1002/acp.914.

Walczyk, J. J., Schwartz, J. P., Clifton, R., Adams, B., Wei, M., & Zha, P. (2005). Lying person to person about life events: A cognitive framework for lie detection. *Personnel Psychology*, 58,141–170. doi:10.1111/j.1744-6570.2005.00484.x

Wright, A. M., & Holliday, R. E. (2007). Interviewing cognitively impaired older adults: How useful is a cognitive interview? *Memory, 15*, 17–33. http://dx.doi.org/10.1080/09658210601047351.

Chapter 4: Psychopathy, Social Dominance and Deception Detection

Abstract

Recent research has demonstrated that a modified version of the Cognitive Interview for Suspects (CIS) in conjunction with Reality Monitoring (RM) is a reliable method of deception detection (Logue et al., 2015). A follow-up study found that observers of the CIS interview were unable to accurately classify true and false accounts, indicating the superiority of actuarial scales in deception detection (Logue et al., under review). The current study examines whether social dominance or psychopathic traits influence deceptive ability, both in terms of subjective observer ratings and Reality Monitoring. Participants were randomly assigned to a truthful or deceptive condition and went through the CIS, with the goal of convincing the interviewer that they did not take the money. Participants completed measures of social dominance (SSSS) and subclinical psychopathy (SRP-III) prior to the experimental paradigm. Findings indicated that social dominance was related to increased ratings of honesty over time, however, socially dominant people were not particularly successful deceivers. Similarly, psychopathic traits were not significantly related to deceptive ability overall. However, Factor 2 psychopathy was linked to being less believable, even when telling the truth. These personality traits were not linked to an increased ability to defeat Reality Monitoring, providing further evidence for the use of this scale.

Chapter 4. Study 3

4.1 Introduction

Deception detection is a field of scientific literature that despite great empirical interest, has demonstrated limited success. Almost five decades of close empirical scrutiny has indicated that regardless of experience or training, people are often able to detect deception at approximately chance levels of accuracy (Bond & DePaulo, 2006; Hartwig et al., 2004; Kraut, 1980). A prevailing theory on the poor deception detection observed in theoretical and practical settings is the over reliance on nonverbal, particularly body language cues. Many lay theories and professional policing manuals have taught that cues such as vocal pitch, response latencies, eye contact, and hand/foot movements may indicate deception (King & Dunn, 2010). Despite the prevalence of these beliefs, the vast majority of body language cues have been found to be unrelated to deception detection. While some body language cues have demonstrated significance in certain studies, the effects often disappear with large sample sizes and strict empirical control (Depaulo et al., 2003; Levine, 2010). A large scale meta-analysis indicated that there was no truly reliable nonverbal cue to deception (Depaulo et al., 2003). While other studies have demonstrated limited empirical support for certain gestures as deception cues, these cues can be drastically affected by circumstances such as rehearsal time and potential ramifications of failure (Stromwall, Hartwig, & Granhag, 2006).

While nonverbal cues have demonstrated limited usefulness in deception detection, verbal indicators have demonstrated increased success. Reality Monitoring is a form of verbal deception detection that is based on cognitive processing. Johnson and Raye (1981) posited that truly experienced events will be encoded differently in memory

in comparison to fabricated accounts, and that this differential encoding will lead to distinguishable differences in language. Specifically, true recollections will involve greater descriptions of visual, auditory, spatial, affective and temporal details. An additional factor, cognitive details, will lead to differential patterns based on operationalization. Recollections of one's own internal thoughts during the event is often indicative of honesty. Conversely, when fabricating a story, individuals may often create a false narrative of the thought processes and motivations of others to create a believable story. Cognitive details of others in an account have been linked to deception in many studies involving Reality Monitoring (McCormick et al., 2009). Collectively, meta-analysis has indicated that Reality Monitoring can reliably detect deception above chance levels (64-71%; Masip et al., 2005). More recent research has focused on increasing the accuracy of Reality Monitoring by developing interview strategies that elicit greater details, subsequently increasing the sensitivity of this scale. Logue et al. (2015) studied the accuracy of Reality Monitoring in determining deception from verbal interviews conducted using a modified version of the Cognitive Interview for Suspects (CIS). This study indicated that Reality Monitoring was effective in accurately discriminating between true and false events. Follow up studies demonstrated that, similar to previous findings in the literature, observers were unable to detect deception after watching videos of the CIS interviews (Logue et al., under review). While the combination of the CIS and Reality Monitoring have shown an overall increase in accuracy in deception detection in comparison to the previous literature, it is important to consider the skill of the deceiver in deception detection. Simply, certain personality traits may make a person a more

believable liar. The two personality traits under examination in this paper are psychopathy and social dominance.

4.1.1 Psychopathy and Deception

Deceptiveness stems from many of the core personality traits that comprise the construct of psychopathy. Psychopaths have long been described to lack empathy, guilty, anxiety, and fear. They are believed to demonstrate impulsivity and shallow emotional processing. While the specific factor structure underlying the construct is under debate in the literature, assessment measures indicate psychopaths have personality characteristics such as: superficial charm, manipulation, shallow affect and a lack of remorse (Cleckley, 1941). These core traits have direct implications for a willingness and potential ability to deceive. In fact, Hare (1993) describes psychopaths as "silver tongued swindlers." It is important to note that psychopathy is often considered an overarching personality trait that consists of underlying factors. Theorists have presented two-, three-, and four-factor models of psychopathy. A comparison of the specific models of psychopathy is beyond the scope of this paper; however, it is important to note that differential scores on various factors predict distinct behavioural outcomes. The most common distinction in psychopathy stems from Hare's original 2-factor model. Factor 1outlines the personality features of psychopathy such as superficial charm, lack of empathy, shallow affect, manipulation, lying, impulsivity, and lack of remorse. Factor 2 represents the antisocial/lifestyle dimension that has become synonymous with criminality. Items in this factor include early behavioural problems, poor behavioural control, juvenile delinquency, promiscuity, failure during probation and criminal versatility (Harpur, Hare, & Hakstian, 1989; Hare, 1991; Hare, 2003). This factor structure has led to the

proposition of primary (Factor 1) and secondary (Factor 2) psychopathy. These separate factors appear to have important behavioural distinctions in a variety of ways. Lykken (1995) proposed that the fundamental difference between primary and secondary psychopathy is trait anxiety. Hicks et al. (2004) found a 2-factor model of psychopathy based on emotional stability. In this study, emotionally stable psychopaths demonstrated less fear, anxiety and reaction to stress than reactive psychopaths, who demonstrated the hallmark signs of secondary psychopathy. Skeem et al. (2003) observed that primary psychopaths are more likely to engage in instrumental aggression, as compared to secondary psychopaths, who respond to provocation with immediate unbridled aggression. Hicks et al's. (2004) emotionally stable psychopaths were less likely to have violent versatile criminal histories and outbursts of reactive aggression than their reactive counterparts. Falkenbach, Poythress, and Creevy (2008) mirrored these findings, demonstrating that primary psychopaths are more likely to demonstrate goal oriented and dispassionate physical force than secondary psychopaths, who demonstrated reactive aggression.

Despite personality traits and anecdotal descriptions that portray psychopaths as prolific and adept deceivers, the empirical literature has been mixed. Consistent with the general conception of psychopathy, researchers have noted that psychopaths are more likely to engage in deceptive acts of criminality such as fraud (Molto, Poy, & Torrubia, 2000), and use deception in both sexual and nonsexual interactions (Seto, Khattar, Lalumiere, & Quinsey, 1997). Rogers and Cruise (2000) noted that psychopaths are more likely to use manipulation and denial in various contexts. Baughman et al. (2014) noted that psychopathy was linked to an increased propensity to lie in the context of

mating and academic dishonesty. Further, psychopathic traits in this sample were linked to experiencing positive emotions while lying. Some other measures of deceptiveness are less clear. While certain studies have indicated that psychopathy is correlated with malingering, others have not substantiated this relationship (Lee, Klaver, & Hart, 2008). Further, Hare, Forth, and Hart (1989) reported that psychopaths do not appear to demonstrate deceptive responses in psychological measures. Finally psychopaths have not been demonstrated to score higher on a battery of tests that are specifically designed to detect malingering (Poythress, Edens, & Watkins, 2001).

Not only is the frequency of deceptiveness of psychopaths unclear, but opinions vary in terms of effectiveness. Numerous studies have indicated that psychopaths use a variety of nonverbal strategies in an attempt to successfully deceive others. Gilstrom and Hare (1988) report that psychopaths are more likely to use small unrelated hand gestures known as “beats” during deception. Louth et al. (1998) reported that psychopaths speak in lower tones when lying. Differences appear early in life, as Rime et al. (1978) observed that young children who score high on psychopathic traits lean forward, have a focused gaze and smile less at interviewers. Klaver, Lee, and Hart (2007) report that these strategies are specific attempts to assert dominance and control during the interview process, in an attempt to be viewed as more believable. In a systematic review of nonverbal behaviour and deception, Klaver, Lee, and Hart (2007) reported that psychopaths spoke faster and demonstrated an increase in head movement and blinking behaviour. However, it should be noted that the authors report that nonverbal indicators of psychopathy are extremely limited.

Verbal behaviours of psychopaths have been studied to a limited extent in the empirical literature. These studies, while relatively few in number, have highlighted deficiencies in the response patterns of psychopaths. Newmann, Harpur and Johnson (1999) found that accounts of psychopaths were less cohesive and coherent than controls. Similarly, Williamson (1991) observed that psychopathy is associated with disordered communication and poorly constructed narratives in both neutral and emotionally arousing events. Williamson argues that it is the lack of social anxiety and a dominant personality rather than sophisticated verbal accounts that allows psychopaths to be successful deceievers. Klaver, Lee, Spidel and Hart (2009) found that psychopathy, as measured by total PCL-R scores, was negatively related to deceptive ability. Similarly, Lee, Klaver, and Hart (2008) demonstrated a conflicting pattern of verbal deceptiveness and psychopathy. Psychopaths were more likely when lying to provide increased details and spontaneous corrections, verbal indicators of honesty. However, psychopaths were seven times more likely to be seen as deceptive when telling the truth. Although psychopaths were not demonstrated to be more successful liars overall, Factor 1 psychopathy was associated with increased credibility in the deceptive condition. One potential source of the conflicting results in the literature is that very few studies have examined deceptive behaviour among primary and secondary psychopaths. The findings of Lee, Klaver, and Hart (2008) are consistent with the characterization of primary psychopaths as cold, calculating and manipulative individuals, and secondary psychopaths as those who are prone to reactive outbursts of anger and frustration. Perhaps the attributes of primary psychopaths are better suited to deceiving others than secondary psychopaths.

Collectively, the empirical literature has provided mixed results on both the propensity and effectiveness of lying behaviour among psychopaths. Numerous studies have provided an unclear picture of whether or not psychopaths actually lie more often than the general population. Some studies have demonstrated that psychopaths believe that they are better liars, and they seem to engage in specific nonverbal methods of attempting to convince others of their honesty. However, numerous studies have indicated that psychopaths demonstrate poor verbal strategies in during deception. Their stories are often not coherent, and the specific content is not believable. Instead, they appear to rely on nonverbal cues to deceive. Whether they are actually successful at deceiving others remains unclear. Lee, Klaver, and Hart (2008) have posited that the mixed results in studies have been due to a failure to separate psychopathy into its primary and secondary factors. The current study aims to provide insight into whether primary or secondary psychopaths are in fact more convincing liars, and whether deceptive ability is moderated by interview style. Observers attempted to detect deception among interviewees both prior to, and after completion of the Cognitive Interview for Suspects (CIS), in order to determine whether psychopathic traits moderate deceptiveness.

4.1.2 Social Dominance and Deception Detection

Although not as extensively studied as psychopathy, social dominance is a personality trait that may be linked to increased ability to successfully deceive others. Social dominance is a trait that leads one to behave in forceful and assertive ways, and is often linked to the ability to control social interactions (Judge, Bono, Illies, & Gerhardt, 2002). Socially dominant people have been demonstrated to gain control in group

decision making processes. In fact, a meta-analysis of 85 years of research indicates that trait social dominance was the best predictor of who would emerge as a leader of a group; even more then specific skills or intelligence (Lord, De Vader, & Alliger, 1986). Interestingly, although social dominance is a higher predictor of group influence than specific task skill, trait social dominance is not sufficient to gain leadership. Studies have demonstrated that forceful personalities who have a demonstrated lack of knowledge in a specific area will not achieve dominance (Van Vugt, 2006). Functionalist theories of leadership indicate that groups allow those with specific knowledge and expertise to have greater influence than others, and attempt to put their most qualified members in charge. Leadership entails both specific task knowledge and the social skills to communicate with and motivate others (Anderson & Kilduff, 2009). Despite the importance of knowledge in leadership, socially dominant individuals are often able to exhibit control in areas that they do not have a claim to authority on, such as ethical dilemmas (Aries, Gold, & Weigel, 1983). Anderson and Kilduff (2009) argue that socially dominant individuals are able to achieve social influence despite a lack of actual knowledge due to engaging in specific behaviours that allow them to appear more competent than they actually are. Consistent with this reasoning, the authors observed that people high on trait dominance were rated by group members and independent raters as more competent when solving group math problems, regardless of level of quantitative skills demonstrated in standardized testing. Further, numerous studies have indicated that individuals high on trait dominance demonstrate nonverbal behaviours that have been linked to the appearance of competence including speaking in more assertive tones, relaxed posture, and direct eye contact (Buss, 1981; Snyder & Sutker, 1977).

Research has demonstrated that socially dominant people use body language and nonverbal cues to create the appearance of task competence, which in turn leads to greater social influence. What remains unclear is whether socially dominant individuals have a general social interaction style that naturally uses these cues, or if they are purposefully using this body language to attain influence. It is quite conceivable that socially dominant individuals may purposefully use impression management skills to create the image of competence. Numerous studies have indicated that lying is part of everyday social interaction. Studies have demonstrated that people typically lie in one out of every three to five interactions. Further, these lies are often not overtly nefarious, such as cheating on a test or denying a transgression. Instead, many lies are often used for impression management, to maintain relationships or create a more favourable impression of oneself (Depaulo et al., 1996). Given that trait dominant individuals are more motivated to create an impression of competence, it is possible that they may be more likely to engage in deception to increase their social standing. Further, given their powers of persuasion, it is conceivable that people higher on social dominance may be more likely to be considered to be believable during deceptive accounts. Keating and Heltman (1994) studied the relationship between social dominance and successful deception throughout the lifespan. The authors noted that both adult males and young children who were higher on peer reported levels of dominance were more successfully deceptive. Dominant children were able to successfully deceive others by smiling, and dominant adult males were successful due to greater eye contact. Further research has linked Machiavellianism, a trait related to social dominance, with greater skill at deception in both children and adults (Braginsky, 1970; Geis & Moon, 1981).

4.1.3 The Current Study

As previously reported, despite volumes of empirical study, deception detection has not shown particularly rapid advancement in the empirical literature. There has been a recent shift away from attempting to determine deception by passive observance of verbal and non-verbal cues to using questioning to actively elicit differential cues to increase deception detection (Vrij & Granhag, 2012). It is important to determine whether certain personality traits are linked to increased deceptiveness, both in baseline questioning and after completing a more cognitively demanding interview. Given the success of the CIS in previous studies, this paper will examine the first and last question of the CIS in relation to interviewee levels of social dominance and psychopathic traits. Both Factor 1 and Factor 2 psychopathy scores will be used to determine whether differential patterns of psychopathy predict deceptiveness. This paper will consider both observer ratings of honesty and Reality Monitoring to determine whether certain individuals can appear honest while being deceptive.

While direct research on the effectiveness of Reality Monitoring when considering personality differences is limited, Reality Monitoring is hypothesized to be successful in detecting deception in those high on social dominance and subclinical psychopathy. Reality Monitoring is a verbal deception detection tool that considers the pattern of details recalled. Logue et al. (2015) demonstrated that higher Reality Monitoring criteria mentioned at the conclusion of a CIS interview allowed for accurate discrimination between truthful and deceptive accounts. The research literature has highlighted nonverbal strategies that have been used by those high on psychopathy and social dominance to successfully deceive others. Given that social dominance is

unrelated to intelligence or task-specific knowledge, it is likely that nonverbal, rather than verbal methods are successful in achieving influence. Further, certain studies have suggested that psychopathy is linked to ineffective verbal strategies while being deceptive. While the evidence suggests that those high on social dominance and psychopathic traits rely on non-verbal cues, it is conceivable that they may also adopt verbal styles that are successful in defeating the RM scale. This theory needs to be directly tested. The current study predicts that the personality traits under examination will not be related to an increased ability to avoid deception detection through Reality Monitoring on verbal accounts elicited through the CIS. Further, it is also hypothesized that those high on social dominance and psychopathic traits will not provide more Reality Monitoring details at the conclusion of the interview in the deceptive condition.

4.2 Method

4.2.1 Participants

Participants in this study were 390 Brock University students (97 Male, 293 Female, age: M = 21.3, SD = 1.21) who completed the study for course credit.

4.2.2 Materials

Psychopathic Traits. The Self-Report Psychopathy Scale: Version III (SRP-III) was used to measure psychopathic traits of interviewees in this study. This scale consists of 64 items measured on a 1 (*strongly disagree*) to 5 (*strongly agree*) likert scale. The SRP-III is divided into four facets: callous affect, interpersonal manipulation, erratic

lifestyle and anti-social traits, which are associated with Factors 1 and 2 of the original PCL-R (Williams & Paulhus, 2004). The SRP-III is also consistent with the expansion of the two factor model into four facets: Impulsive Thrill-seeking, Anti-Social Behaviour, Interpersonal Manipulation, and Cold Affect. The SRP-III has been demonstrated to be related to anti-social personality and behaviours (Williams et al., 2007). This measure has been demonstrated to be an appropriate measure of subclinical psychopathic traits (Williams et al., 2003).

Social Dominance. Social dominance was measured using the Self-Perceived Social Status Questionnaire (SSSS: Buttmore, James & Kirkpatrick, 2005). This self-report scale was measured on a 1 (*strongly disagree*) to 5 (*strongly agree*) Likert scale. The SSSS consists of a scale of social dominance and a scale of prestige. Social dominance involves using aggressive and forceful tactics to exert control. Specific items on this scale are "I demand respect from members of my peer group," and "Others believe they can push me around" (reverse-scored). Prestige involves gaining social status not by having a forceful or assertive personality, but instead by having skills and competencies that are useful to the group. While prestige has been noted to be a factor in areas of peer influence, this subscale is beyond the scope of this paper and was not included in analyses.

Videos. Participants were shown segments from the CIS as completed in Logue et al. (2015). In a previous study (Logue et al., 2015) participants were interviewed after completing a game scenario adapted from Vrij, Mann, Leal, and Fisher (2010). Participants in the Truthful condition of this study played a game with a confederate, during which they were left alone in a room with a wallet. Eventually, the participant

was confronted about money that had allegedly been stolen from a wallet that was in the room during the game. Instead of actually participating in the scenario, participants in the Deceptive condition were provided a transcript of the sequence of events in the Truth condition, and directed to take the money out of the wallet. They were then directed to use this template to construct a convincing lie and given equivalent time to practice it. Depending on condition, participants were told that they would win/keep the money if they were able to convince the interviewer of their innocence. After completing the initial scenario, participants in both conditions were interviewed using the CIS. The videos of these interviews served as the materials that participants in the current study used to rate honesty and deception. These videos depict the interviewee, facing the camera in a "first person perspective" to the right of the interviewer. The interviewer is not visible in any of the videos. The camera was approximately 5 feet away from the interviewee and was adjusted to provide a clear view of the interviewee's face, arms and body below the knee. The current study required that raters were able to view the initial (control) and final question of the CIS. Interviews were limited to a maximum total time of 3 minutes, including the questions of the interviewer. One hundred videos of the original 157 were selected. Only 38 truthful videos fit these criteria, and therefore all were included in the 100 stimulus materials. The remaining videos were randomly selected out of a pool of deceptive videos that met the aforementioned time constraints.

4.2.3 Procedure

Sessions were conducted in groups of up to eight participants, and composition was determined through self-selection on a university website. Each participant watched 10 interviewees answer both the first and last question of the CIS. After each question,

participants were asked to rate the honesty of the interviewee, so that there were two ratings per interview, and a total of 20. Each interview was watched a total of 40 times, to create an aggregate score of honesty, and interviews were counterbalanced to avoid practice effects.

The first question that each interviewee responded to was:

"Please tell me in as much detail as possible, what happened when you were in the room with [Researcher 1] just now. Please mention all details, all conversations that took place, and give as much information as possible, including everyone whom entered the room, however irrelevant it may seem. Please tell me as much as you possibly can, as I will use all the information to decide whether or not I think you are telling the truth."

This question served as the initial recall of the event.

The second question each interviewee responded to was:

"Please tell me in as much detail as possible, what happened when you were in the room with [Researcher 1] just now. Please mention all details, all conversations that took place, and give as much information as possible, including everyone whom entered the room, however irrelevant it may seem. Please tell me as much as you possibly can, as I will use all the information to decide whether or not I think you are telling the truth. It is very important that you tell me all of the information you have told me throughout the interview, even if you have mentioned it in previous questions, as well as anything else you may like to add. This will be your last chance to convince me you are telling the truth."

This question was the last question in the CIS protocol, which served as a final, comprehensive account after all of the steps had been completed. The videos depicted the full answers of the interviewee. The interviewer did not ask any follow-up or clarifying questions. At the conclusion of each clip participants were asked make judgements on the truthfulness of each answer. Participants viewed the interview on a large projector screen collectively, but provided ratings of honesty individually. A researcher was present in the room to ensure independent ratings. As previously stated, participants rated truthfulness after both the initial and final questions of each interview.

4.2.3 (a) Scoring Criteria

Observer Ratings. Participants were requested to provide judgments of deceptiveness after each interview question in the following ways. First, they were asked to provide an initial categorical judgment by circling T (truthful) or D (deceptive). Additionally, participants also rated the level of honesty after each answer on a 1 (*very untruthful*) to 6 (*very truthful*) Likert scale.

Qualitative Measure. At the conclusion of the study, after watching and rating all videos, participants were requested to provide researchers with the criteria they used to judge truthfulness. Answers were provided in an open-ended format to provide insight into the general strategies that participants used to make judgments.

Reality Monitoring. Scoring was conducted by an additional researcher, blind to experimental condition. The researcher scored the last CIS responses based on six Reality Monitoring criteria: visual, spatial, auditory, temporal, affective, and cognitive details. Scoring consists of a simple frequency tally of each criterion. The Reality

Monitoring criteria used in this study are concrete, unambiguous, reliable, and simple to score. It should be noted that in this study cognitive operations refers to inferred motivations and thought processes of others, rather than one's own thoughts. There is a debate in the literature regarding the operationalization of cognitive operations. The authors adopt the viewpoint of McCormack et al. (2009) that fabricating a story may involve creating a narrative of the motivations of others to create a more believable story. Numerous researchers have noted that deceptive individuals often attempt to "fill in the gaps" in the story by providing motivations for the actions of others. Full scoring procedure and rationale can be found in Logue et al. (2015).

Logue et al. (2015) demonstrated that Reality Monitoring was a highly effective verbal deception detection method in conjunction with the CIS. The current study aims to determine whether psychopathic traits or social dominance may be related to success in defeating the Reality Monitoring scale. The predicted probability of success was calculated by correlating success in being deemed truthful by the Reality Monitoring scale and the aforementioned traits.

4.3 Results

4.3.1 Psychopathy and Observer Ratings of Honesty

Seven of the 100 videos initially included in this analysis had missing data in observer ratings, making them unsuitable for analysis. Of the remaining 93 cases, 36 were truthful and 57 were deceptive. When considering the overall sample, regardless of condition, psychopathy was not significantly associated with deceptiveness ratings after

the first question. However, total SRP-III score (r = -.19, p = .06) and Factor 2 (r = -.19, p = .06) were negatively correlated with observer ratings of honesty after the second question (see Table 4.1). Although these results are only marginally significant they suggest that regardless of condition, people who score high on Factor 2 psychopathy traits appear less truthful at the conclusion of the CIS. Similarly, in the truthful condition, total SRP-III, Factor 1, and Factor 2 traits were not significantly related to observer ratings of truthfulness during initial questioning. However, in the truthful condition, Factor 2 psychopathy was negatively related to truthfulness (r = -.28, p = .09) at a marginally significant level (see Table 4.2). Interestingly, in the deceptive condition, total SRP-III, Factor 1 and Factor 2 scores were not correlated to observer ratings of honesty after the initial or final CIS questions (see Table 4.3). These results indicate that contrary to popular opinion, people with psychopathic traits are not able to appear more honest than others either while being deceptive initially, or after completing the CIS. Interestingly, total SRP-III score, particularly Factor 2, appears to be negatively associated with observer ratings of honesty after completing the CIS, even while being truthful. Although these results were only marginally significant, they highlight the possibility that Factor 2 psychopathic traits may be counterproductive during questioning.

4.3.2 Social Dominance and Observer Ratings of Honesty

When considering the overall sample, regardless of condition, social dominance was not significantly correlated to observer ratings of honesty for the initial or final CIS question. Further, social dominance was not significantly correlated with observer ratings of honesty in the first or last question in the truthful condition. In the deceptive condition, social dominance was not significantly related to overall observer ratings of

honesty in either CIS question. However, social dominance was positively correlated to a change in observer ratings of honesty from initial to final question in the CIS (r = .29, p = .03). These results indicate that socially dominant people do appear more honest over time, although not enough to change initial opinions in this sample (see Tables 4.1-4.3).

4.3.3 Reality Monitoring and Deception Detection as a Function of Social Dominance and Psychopathy

When considering the full sample, social dominance was negatively correlated to successfully being judged as truthful (r = -.16, p = .05). Conversely, Factor 1, Factor 2, and total SRP-III were unrelated to success. In the truthful condition Factor 1, Factor 2, Total SRP-III and social dominance were not related to being judged as truthful by the Reality Monitoring scale. Finally, when considering the deceptive condition, Factor 1, Factor 2, total SRP-III, and social dominance were not related to being judged truthful by the Reality Monitoring scale (see Table 4.4).

The previous study found that only 7 of 79 deceptive people were judged to be deceptive by the Reality Monitoring scale (Logue et al., 2015). A series of independent t-tests were conducted to determine whether participants who successfully defeated the Reality Monitoring scale differed from those who were caught by the scale on psychopathic traits and social dominance. Factor 1, Factor 2 psychopathy, and social dominance were not related to successfully defeating the scale. When considering predicted probability of defeating the Reality Monitoring scale, none of the personality traits under examination were significantly related to success. Given the disparity in sample sizes, effect sizes were calculated. Cohen's d indicates small effects for social

dominance, in that deceptive people who were judged as truthful had slightly higher SSSS scores. Conversely, Cohen's *d* indicated a small effect for Factor 1, Factor 2, and total SRP-III scores, in that deceptive people who were judged as truthful by RM had lower scores on these scales. However, given the lack of significance of t-tests, these results should be interpreted with caution.

4.3.4 Verbal Deception Strategies

Only 7 of 79 participants were able to defeat the Reality Monitoring scale, limiting the conclusions that may be drawn due to low power. Although a small percentage of individuals were actually successful, it is important to determine whether persons high on the traits under examination use verbal strategies that would be suited to defeat Reality Monitoring. Therefore, social dominance, Factor 1 and Factor 2 psychopathy were correlated with Reality Monitoring scores at various times throughout the CIS interview. When considering the deceptive condition, participants who scored high on Factor 1 psychopathy were more likely to mention increased visual (r = .23, p =.04), spatial (r = .23, p = .05), and temporal (r = .23, p = .04) details in the initial question. Similarly, individuals high on social dominance were also more likely to reference visual (r = .23, p = .04), spatial (r = .24, p = .04) and temporal (r = .25, p = .03) details during initial questioning. Factor 2 was not related to an increase in Reality Monitoring criteria. SRP-III was marginally related to an increase in spatial details (r = .22, p = .06) in the initial question (see Table 4.7). When considering the final question in the deceptive condition, Factor 1 (r = -.33, p = .01), Factor 2 (r = -.20, p = .08) and total SRP-III (r = -.30, p = .01) were related to a decreased amount of spatial details provided. No other Reality Monitoring criteria were correlated with F1, F2 or social

dominance in the final CIS question (see Table 4.8). Finally, participants in the deceptive condition who were high on Factor 1 psychopathy showed a significant reduction in visual (r = -.25, p = .03) and spatial details (r = -.33, p < .01) provided at the conclusion of the interview in comparison to the beginning. Similarly, participants high on total SRP-III also showed a significant reduction in spatial details provided at the conclusion of the interview when compared to initial report (r = .30, p = .01) (see Table 4.9). These results indicate that those high on F1 and social dominance may attempt to provide more details at the beginning of the interview to appear believable, however they are unable to report these details after the cognitive load induced by the CIS.

When considering the truthful condition, Factor 1 (r = -.34, p < .01), Factor 2 (r = -.26, p = .02) and social dominance (r = -.34, p < .01) were all correlated with less temporal details being provided during the initial recall (see Table 4.10). There were no significant correlations observed between the personality traits under examination and Reality Monitoring criteria at the conclusion of the interview among truthful participants (see Table 4.11). Further, participants high on Factor 1 (r = .26, p = .02) and total SRP-III (r = .23, p = .05) demonstrated a significant increase in temporal details at the conclusion of the interview. Those higher on social dominance demonstrated an increase in the amount of audio (r = .31, p = .01) details provided at the conclusion of the interview (see Table 4.12). These results are consistent with Logue et al.'s (under review) finding that truthful individuals provide more details at the conclusion of the CIS.

4.4 Discussion

The current research investigates two personality traits that have been linked to increased ability to deceive others, psychopathy and social dominance. Despite numerous conceptualizations of psychopaths as skilled liars, research has been divided on whether those with psychopathic traits are seen as more believable than non-psychopathic controls. The current study examines the perceived honesty of those with psychopathic traits, prior to and after completing an adapted form of the CIS. Consistent with previous research, psychopathy was not linked to increased observer ratings of honesty at the beginning or conclusion of the CIS. Factor 1 psychopathy was unrelated to believability of responses prior to or after completing the interview, whether the participant was actually truthful or deceptive. Interestingly, higher total psychopathy score was linked to lower perceived honesty overall, particularly in the truthful condition. This effect appears to be driven by those scoring high on Factor 2 psychopathy. Although the effects were marginally significant, it appears that those who are high on Factor 2 psychopathy will appear to be less truthful after an information gathering interview such as the CIS, even when they are actually telling the truth. This finding may provide insight into the conflicting results regarding the deceptive ability of psychopaths in the literature, particularly when using total PCL-R scores (Klaver, Lee, Spidel & Hart, 2009). It is possible that Factor 2 psychopathy is counter-productive to deceptive ability.

One potential reason for the failure of psychopaths to successfully deceive observers in this sample is the potential lack of consistency between stories. As previously stated, people with psychopathic traits tend to tell stories that are less coherent and consistent (Newmann, Harpur & Johnson, 1999; Williamson, 1991). This study

involves participants observing a party tell two versions of the same event, shown back to back. In cases of repeated stories, observers often use consistency as a measure of honesty, even though in many cases this is a poor strategy (Granhag & Stromwall, 2002). In fact, many studies have demonstrated that people who are telling repeated lies go to great efforts to tell a consistent story (Blair et. al, 2012). While this strategy may be ineffective in the general population, it may be effective among psychopaths who do not appear to go to great efforts to tell a consistent and coherent story. Recklessness and impulsivity is a core feature of psychopathy. In a comparison of psychopathy and Machiavellianism, Baughman et al. (2014) noted that while both traits were linked to deceptiveness, only Machiavellianism was associated with increased effort to tell a convincing and detailed story.

Collectively, the results of this study indicate that psychopathic traits do not lead to increased believability, contrary to Hare's (1993) "silver tongued swindler." Perhaps the reason that psychopaths are able to manipulate others is that they are more willing to lie for selfish purposes, rather than having an innate skill. Numerous studies have observed that people have a general "truth bias" to believe what others are saying, unless given specific evidence to the contrary (Street & Masip, 2015). Psychopaths may be more willing to exploit the general desire for people to believe in the goodness of others. An additional possibility is that psychopaths' gift for deception may not lie in an increased ability to lie, but with victim selection. Numerous theorists have argued that psychopaths are social predators, who selectively choose targets to increase success of criminality (Book et al., 2007; Hare, 2001). One line of research indicates that Factor 1, not Factor 2, psychopathy is positively correlated with successful victim selection.

Wheeler, Book and Costello (2009) observed that a subclinical population of undergraduate students who scored high on Factor 1 psychopathy were able to select vulnerable populations merely by observing their gait. Book, Costello and Camalleri (2013) replicated these findings in a prison sample, indicating that Factor 1 psychopathy as assessed by the PCL-R is related to successful victim selection. This line of reasoning indicates that the success of psychopaths may be a consequence of selectively choosing those who are easier to deceive, rather than the ability to lie more effectively.

Conversely, socially dominant individuals did become significantly more convincing throughout the course of the interview, although they were not particularly effective liars. One potential reason for this finding is that social dominance was measured through self-report, rather than observer ratings. It is possible that in this study, participants may have an inaccurate or inflated view of their dominance in social interactions. Simply, self-reported dominance may be a measure of an inflated view of self, rather than an accurate appraisal of dominance. Another, perhaps more compelling, theory lies in the methodology of the study. Social dominance involves a person who is highly motivated to, and is often accomplished at, taking control of social situations and exerting influence on decision making (Anderson & Kilduff, 2009). The current research involves an inherent power imbalance; the interviewer asks the questions, and the participants answer them. The interviewer is in the position of authority, controlling and directing the process. Further, the current methodology directs the interviewer not to engage in any follow up questioning, or answer any questions of the interviewee. The structured setting of the CIS does not allow for the interviewee to gain any control in the

interview, which may limit the effectiveness of socially dominant people to be viewed as more persuasive in this study.

The current research provides further evidence for the combination of Reality Monitoring and an information gathering interview approach such as the CIS as a reliable deception detection method. Trait social dominance and subclinical psychopathy were unrelated to the probability of being assigned to the Deception condition, indicating that individuals with these traits are unable to deceive the scale. It is important that a uniform deception detection method such as an actuarial scale is effective regardless of the traits of the interviewee. Reality Monitoring was hypothesized to be an effective measure as psychopathy and social dominance are often linked to the use of nonverbal rather than language-based cues to deceive or persuade others. The success of this scale was demonstrated as only 7 of 79 deceptive people were classified as truthful. While these results do indicate that this scale accurately detects deception, and the aforementioned traits were not correlated with success, it is difficult to generalize the results of this study due to low power in the deceptive condition.

In an attempt to address the power limitation in the deceptive condition, the verbal strategies that participants used during the interview were examined, regardless of success in defeating Reality Monitoring. The results of this study indicate that people who are high on social dominance and psychopathic traits do not demonstrate patterns of verbal responses that are successful in defeating the Reality Monitoring scale by the conclusion of the CIS protocol. Interestingly, when being deceptive, participants high on Factor 1 and social dominance demonstrate increased visual, spatial and temporal details during the initial questioning. This finding indicates that these personality traits may lead

to an increased ability to appear honest during initial questioning. However, these effects disappeared by the conclusion of the interview, potentially due to cognitive load. In fact, individuals high on Factor 1 and total SRP-III demonstrated a significant decrease in spatial criteria at the conclusion of the interview in comparison to the first question, in contrast to the pattern of information demonstrated by truthful individuals. These results support the use of the CIS in conjunction with Reality Monitoring. While these individuals were not successful at defeating the scale in this sample, it is possible that individuals high on these traits may be more effective deceivers in a less cognitively taxing interview.

Further, it should be noted that psychopathy and social dominance demonstrated differential results in the Truthful condition. Logue et al. (under review) have argued that truthful individuals generally report higher baseline Reality Monitoring criteria during initial questioning, and reported details increase by the conclusion of the interview. However, in this sample Factor 1, Factor 2 and total SRP-III scores were all linked to lower temporal details provided during the initial questioning. There were no significant differences between any Reality Monitoring details reported during the final question as a function of any personality trait. While they should be interpreted with caution, these results highlight the possibility that people high on psychopathic traits may provide less Reality Monitoring criteria when telling the truth during basic questioning. Despite this caveat, there were no differences in Reality Monitoring criteria reported at the conclusion of the CIS, providing further support the use of this interview in conjunction with Reality Monitoring.

4.4.1 Limitations and Future Research

The goal of this study was to provide insight into personality traits that may lead to increased ability to deceive others both prior to and after the CIS in a controlled experimental environment. However, there are limitations that need to be addressed. First, the interviewees in this study were selected from a university, not correctional, sample. This was necessary to provide a study of this size and scope. Further, the SRP-III has been linked to many behavioural signs of psychopathy. Despite this, true clinical psychopaths may have been more successful liars. Future research should use a clinical sample as assessed by the PCL-R. A related concern is the sample size. While this sample lead to marginal significance for the findings that total and Factor 2 traits are related to lower ratings of truth after completing the CIS, particularly when truthful, the relative power of this study was low. Power analysis indicates that 80 participants were required to find an existing effect, and some analyses did not meet that threshold. Additionally, the structured nature of the interviews may have served to limit the ability of socially dominant people to be deceptive. While this research has direct bearing on the ability of socially dominant people to deceive law enforcement officers in a controlled interview setting, it cannot answer the larger question of whether socially dominant individuals may be more effective in deceiving others in conditions where they may be able to exert more control. To our knowledge, there is little research on whether trait social dominance involves naturally using nonverbal cues that are more likely to be believed, or whether these individuals actively engage in deception to increase social influence. While this is beyond the scope of this paper, the use of deception to increase social standing is an important topic with larger social implications.

Finally, there may be other personality traits that are more effective in deceiving others, even in controlled policing interviews. Two obvious candidates are Narcissism and Machiavellianism. Narcissism is defined as a feeling of entitlement, vanity and a grandiose sense of self-worth (Paulhus & Williams, 2002). Machiavellianism is characterized as emotional coldness, manipulativeness and a willingness to sacrifice the good of others for individual success (Jonason, Slomski, & Partyka, 2012). Both of these traits have been linked to subclinical psychopathy in a "dark triad" (Paulhus & Williams, 2002). This constellation of personality traits has been linked to many negative behavioural outcomes including: relationship infidelity (Brewer, Hunt, James, & Abell, 2015), violence (Pailing, Boone, & Egan, 2013) and theft (Lyons & Jonason, 2015). Further, the dark triad has been linked to authoritative styles of social dominance. Given the link between these traits and psychopathy, it is possible that these related personality traits may lead to more successful deception during the CIS. Machiavellianism has been linked to deceptiveness in many studies. Machiavellianism is a predictor of telling self-serving lies (McLeod & Genereux, 2008), and effectiveness in telling high stakes lies such as academic dishonesty (Azili et al., 2016). Further, as previously noted, Machiavellianism is linked to lying to manipulate others, and to taking great effort to develop a consistent and believable story. Baughman, Jonason, Lyons, and Vernon (2014), noted that Narcissism is also linked to a willingness to commit academic dishonesty. Given the link between the dark triad and negative behavioural outcomes, it is conceivable that persons high on these traits may be over represented in law enforcement interviews. Further research should investigate whether Machiavellianism and Narcissism increase ability to be deceptive in law enforcement interviews.

The current study indicates that despite the general conception of psychopaths as prolific and effective liars, they were not able to successfully deceive observers during a modified version of the CIS. Sub-clinical psychopathy was unrelated to successful deception, and secondary psychopathy was linked to the appearance of dishonesty, regardless of conditions. Possible reasons for these findings are a lack of consistency in verbal stories demonstrated by psychopaths, and increased frustration and anger that is a hallmark of secondary psychopathy. While social dominance was correlated to greater perceived truthfulness throughout the interview, it was not related to overall appearance of honesty. One potential reason for this finding is the inability of those higher in social dominance to use strategies to control the social interaction in a structured suspect interview such as the CIS. Collectively, the ineffectiveness of individuals with personality traits that have been linked to persuasiveness and deceptiveness during the interview process provides some evidence that the CIS is an effective interview strategy to eliminate potential effects of deceiver skill on deception detection. Further research should consider personality traits such as Narcissism and Machiavellianism to confirm the effectiveness of the CIS.

Table 4.1.

Correlations between personality traits and observer ratings of honesty full sample.

		Factor 1	**Factor 2**	**Total SRP**	**Social Dominance**
CIS Question 1	Correlation	-0.07	-0.13	-0.11	0.03
	Sig.	0.52	0.22	0.31	0.78
CIS Question 5	Correlation	-0.16	-0.19*	-0.19*	-0.06
	Sig.	0.12	*0.06*	*0.06*	0.59
Difference Score	Correlation	0.12	0.09	0.11	0.12
	Sig.	0.24	0.43	0.28	0.27

Note: N = 93

Table 4.2

Correlations between observer ratings of honesty and personality traits in the truthful condition.

		Factor 1	Factor 2	Total SRP	Social Dominance
CIS Question 1	Correlation	-0.09	-0.21	-0.16	-0.15
	Sig.	0.63	0.20	0.33	0.37
CIS Question 5	Correlation	-0.14	-0. 28*	-0.23	-0.05
	Sig.	0.40	0.09	0.17	0.75
Difference Score	Correlation	0.09	0.09	0.10	-0.18
	Sig.	0.60	0.60	0.56	0.29

Note: N = 36

Table 4.3.

Correlations between observer ratings of honesty and personality traits in the deceptive condition.

		Factor 1	**Factor 2**	**Total SRP**	**Social Dominance**
CIS Question 1	Correlation	-0.05	-0.04	-0.05	0.19
	Sig.	0.72	0.79	0.73	0.15
CIS Question 5	Correlation	-0.17	-0.11	-0.16	-0.05
	Sig.	0.21	0.42	0.25	0.71
Difference Score	Correlation	0.14	0.08	0.13	0.29*
	Sig.	0.29	0.53	0.35	*0.03*

Note: N = 57

Table 4.4.

Predicted probability of being judged as truthful by Reality Monitoring as a function of personality traits in all conditions.

		Truth	**Deceptive**	**Total Sample**
Factor 1	Correlation	.06	.06	.09
	Significance	.63	.61	.24
Factor 2	Correlation	.09	.06	.13
	Significance	.45	.61	.11
Total SRP	Correlation	.08	.06	.12
	Significance	.50	.57	.13
Social Dominance	Correlation	-.18	-.02	-.16*
	Significance	.12	.87	*.05*

Table 4.5

Descriptive statistics of personality variables as a function of success in deceiving Reality Monitoring scale in deceptive condition

	Personality Variable	**Number**	**Mean**	**S.D.**	**S.E Mean**
Social Dominance	Failure	72	69.28	10.55	1.24
	Success	7	71.14	11.58	4.38
Factor 1 Psychopathy	Failure	72	77.39	15.74	1.85
	Success	7	74.86	13.62	5.15
Factor 2 Psychopathy	Failure	72	67.35	15.04	1.77
	Success	7	66.29	12.59	4.76
Total SRP III Score	Failure	72	144.73	27.93	3.29
	Success	7	141.14	23.52	8.89

Note: N = 79

Table 4.6

Independent t-tests for successfully defeating Reality Monitoring in deceptive condition as a function of Psychopathy and Social Dominance

		T	Df	Mean Diff.	SE Diff	Sig. (2 tail)	Cohen's d
Social Dominance	Eq. Var Assumed	-0.44	77	-1.87	4.21	0.66	0.17
	Not Assumed	-0.41	7.00	-1.87	4.55	0.69	
Factor 1	Eq. Var Assumed	0.41	77	2.52	6.17	0.68	0.17
	Not Assumed	0.46	7.65	2.52	5.47	0.66	
Factor 2	Eq. Var Assumed	0.18	77	1.06	5.89	0.86	0.08
	Not Assumed	0.21	7.77	1.06	5.08	0.84	
Total SRP	Eq. Var Assumed	0.33	77	3.59	10.93	0.74	0.13
	Not assumed	0.38	7.74	3.59	9.47	0.72	

Note: N = 79

Table 4.7

Correlation between Reality Monitoring criteria and initial CIS questioning in the deceptive condition.

		Visual	**Audio**	**Spatial**	**Temporal**	**Cognitive**	**Affective**
Social Dominance	Correlation	0.23*	0.11	0.24*	0.25*	-0.05	-0.08
	Sig (2-tail)	*0.04*	0.33	*0.04*	*0.03*	0.64	0.46
Factor 1	Correlation	0.23*	-0.02	0.23*	0.23*	0.08	-0.12
	Sig (2-tail)	*0.04*	0.88	*0.05*	*0.04*	0.49	0.30
Factor 2	Correlation	0.11	-0.05	0.16	0.07	0.19	-0.01
	Sig (2-tail)	0.34	0.69	0.15	0.54	0.10	0.97
SRP Total	Correlation	0.19	-0.02	0.22*	0.17	0.15	-0.07
	Sig (2-tail)	0.09	0.90	*0.06*	0.14	0.20	0.54

Note: N = 79

Table 4.8

Correlations between Reality Monitoring criteria and final CIS question in the deceptive condition

		Visual	Audio	Spatial	Temporal	Cognitive	Affective
Social Dominance	Correlation	0.07	-0.01	0.15	0.08	0.05	0.14
	Sig (2-tail)	0.53	0.92	0.18	0.47	0.67	0.24
Factor 1	Correlation	0.16	0.05	-0.33	-0.15	0.01	0.12
	Sig (2-tail)	0.15	0.67	*0.01***	0.19	0.92	0.29
Factor 2	Correlation	0.03	0.13	-0.20	-0.16	0.04	-0.02
	Sig (2-tail)	0.78	0.25	0.08*	0.15	0.75	0.85
SRP Total	Correlation	-0.08	0.10	-0.30*	-0.17	0.03	-0.06
	Sig (2-tail)	0.51	0.39	*0.01*	0.13	0.82	0.63

Note: N = 79.

Table 4.9

Correlations Between difference scores of Reality Monitoring criteria and personality traits in the deceptive condition

		Visual	Audio	Spatial	Temporal	Cognitive	Affective
Social Dominance	Correlation	-0.18	-0.08	-0.15	-0.07	0.05	0.13
	Sig (2-tail)	0.11	0.50	0.18	0.56	0.65	0.27
Factor 1	Correlation	-0.25*	- 0.02	-0.33*	-0.14	0.01	0.11
	Sig (2-tail)	*0.03*	0.86	*<0.01*	0.24	0.91	0.32
Factor 2	Correlation	-0.07	0.07	-0.20	-0.16	0.03	-0.03
	Sig (2-tail)	0.53	0.57	0.07	0.17	0.80	0.79
SRP Total	Correlation	-0.18	0.02	-0.30*	-0.16	0.03	0.05
	Sig (2-tail)	0.11	0.84	*0.01*	0.16	0.84	0.68

Note: N = 79.

Table 4.10

Reality Monitoring details provided as a function of personality traits in the truthful condition during initial question.

		Visual	Audio	Spatial	Temporal	Cognitive	Affective
Social Dominance	Correlation	0.10	-0.12	0.03	-0.09	0.12	0.08
	Sig (2-tail)	0.40	0.29	0.83	0.42	0.30	0.49
Factor 1	Correlation	0.08	-0.04	-0.16	-0.34**	0.05	-0.03
	Sig (2-tail)	0.47	0.72	0.16	*< .01*	0.65	0.79
Factor 2	Correlation	0.18	-0.11	0.05	-0.26*	0.15	-0.05
	Sig (2-tail)	0.12	0.33	0.66	*.02*	0.20	0.68
SRP Total	Correlation	0.14	-0.08	-0.08	-0.34**	0.11	-0.04
	Sig (2-tail)	0.23	0.48	0.51	*< .01*	0.36	0.71

Note: N = 78.

Table 4.11.

Correlations between personality traits and Reality Monitoring criteria during the final CIS question for truthful participants

		Visual	Audio	Spatial	Temporal	Cognitive	Affective
Social Dominance	Correlation	0.07	0.17	0.07	0.08	-0.03	0.14
	Sig (2-tail)	0.56	0.14	0.56	0.49	0.82	0.23
Factor 1	Correlation	0.11	-0.06	-0.09	-0.06	0.02	0.05
	Sig (2-tail)	0.33	0.58	0.46	0.63	0.89	0.64
Factor 2	Correlation	0.01	-0.06	-0.09	-0.11	-0.12	0.12
	Sig (2-tail)	0.93	0.58	0.42	0.34	0.29	0.31
SRP Total	Correlation	0.08	-0.07	-0.10	-0.09	-0.05	0.09
	Sig (2-tail)	0.51	0.54	0.39	0.44	0.67	0.43

Note: N = 78.

Table 4.12.

Difference score correlations with Reality Monitoring criteria in the truthful condition.

		Visual	Audio	Spatial	Temporal	Cognitive	Affective
Social Dominance	Correlation	0.01	0.31*	0.05	0.17	-0.09	0.07
	Sig (2-tail)	0.95	*0.01*	0.68	0.13	0.45	0.56
Factor 1	Correlation	0.07	-0.05	0.04	0.26*	-0.02	0.09
	Sig (2-tail)	0.53	0.70	0.74	*0.02*	0.90	0.46
Factor 2	Correlation	-0.12	0.02	-0.14	0.13	-0.18	0.15
	Sig (2-tail)	0.30	0.89	0.24	0.26	0.12	0.18
SRP Total	Correlation	-0.01	-0.02	-0.04	0.23*	-0.10	0.13
	Sig (2-tail)	0.90	0.86	0.72	*0.05*	0.39	0.26

Note: N = 78.

4.5 References

Anderson, C., & Kilduff, G. (2009). Why do dominant personalities attain influence in face-to-face groups? The competence-signaling effects of trait dominance. *Journal of Personality and Social Psychology*, 96(2), 491-503.

Aries, E. J., Gold, C., & Weigel, R. H. (1983). Dispositional and situational influences on dominance behavior in small groups. *Journal of Personality and Social Psychology*, 44(4), 779-786. doi:http://dx.doi.org.proxy.library.brocku.ca/10.1037/0022-3514.44.4.779

Azizli, N., Atkinson, B. E., Baughman, H. M., Chin, K., Vernon, P. A., Harris, E., & Veselka, L. (2016). Lies and crimes: Dark Triad, misconduct, and high-stakes deception. *Personality and Individual Differences*, 89, 34-39. doi:10.1016/j.paid.2015.09.034.

Baughman, H., Jonason, P., Lyons, M., & Vernon, P. (2014). Liar, liar, pants on fire: Cheater strategies linked to the dark triad. *Personality and Individual Differences*, 71, 35-38.

Blair, J. P., Levine, T. R., Reimer, T. O., & McCluskey, J. D. (2012). The gap between reality and research. *Policing: An International Journal of Police Strategies & Management, 35*(4), 723-740. doi:10.1108/13639511211275553.

Bond, C., & DePaulo, B. (2006). Accuracy of deception judgments. *Personality and Social Psychology Review*, 10(3), 214-234. doi:10.1207/s15327957pspr1003_2.

Book, A.S., Costello, K., & Camilleri, J. (2013). Psychopathy and Victim Selection: The Use of Gait as a Cue to Vulnerability. *Journal of Interpersonal Violence*, 28, 2368-2383.

Book, A. S., Quinsey, V. L., & Langford, D. (2007). Psychopathy and the perception of affect and vulnerability. *Criminal Justice and Behavior*, 34(4), 531-544. doi: http://dx.doi.org.proxy.library.brocku.ca/10.1177/0093854806293554

Braginsky, D. D. (1970). Machiavellianism and manipulative interpersonal behavior in children. *Journal of Experimental Social Psychology*, 6, 77-79.

Brewer, G., Hunt, D., James, G., & Abell, L. (2015). Dark triad traits, infidelity and romantic revenge. *Personality and Individual Differences*, 83, 122-127. doi:10.1016/j.paid.2015.04.007

Buss, D. M. (1981). Sex differences in the evaluation and performance of dominant acts. *Journal of Personality and Social Psychology*, 40(1), 147-154. doi: http://dx.doi.org.proxy.library.brocku.ca/10.1037/0022-3514.40.1.147

Cleckley, H. (1941). *The mask of sanity: An attempt to reinterpret the so-called psychopathic personality (1st ed.)*. Oxford: Oxford University Press.

DePaulo, B. M., Kashy, D. A., Kirkendol, S. E., Wyer, M. M., & Epstein, J. A. (1996). Lying in everyday life. *Journal of Personality and Social Psychology*, 70(5), 979-995. doi:10.1037/0022-3514.70.5.979.

DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenbruck, L., Charlton, K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin, 129,* 74–118. http://dx.doi.org/10.1037/0033-2909.129.1.74.

Geis, F. I. , & Moon, T. (1981). Machiavellianism and deception. *Journal of Personality and Social Psychology*, 41, 766-775.

Geiselman, R. E. (2012). The cognitive interview for suspects. *American Journal of Forensic Psychology, 30,* 1–16.

Gillstrom, B. J., & Hare, R. D. (1988). Language-related hand gestures in psychopaths. *Journal of Personality Disorder*, 2, 21–27.

Granhag, P. A., & Strömwall, L. A. (2002). Repeated interrogations: Verbal and non verbal cues to deception. *Applied Cognitive Psychology*, 16(3), *243-257.* doi:10.1002/acp.784

Green, D. M., & Swets, J. A. (1966). *Signal detection theory and psychophysics.* New York, NY: Wiley.

Kleinmuntz B., & Szucko, J.J. (1984). Lie detection in ancient and modern times: a call for contemporary scientific study. *American Psychologist*, 39, 766–776.

Hare, R. D. (1991). *Hare Psychopathy Checklist—Revised (PCL-R): Technical manual* . Toronto: Multi-Health Systems.

Hare, R. D. (1993*). Without Conscience: The disturbing world of psychopaths among us*. New York: NY, Pocket books.

Hare, R.D. (1998). The Hare PCL-R: Some concerns over its use and misuse. *Legal and Criminological Psychology*, 3, 99-119.

Hare, R. D. (2003). *Hare Psychopathy Checklist—Revised (PCL-R): Technical manual (2nd ed.).* Toronto: Multi-Health Systems.

Hare, R.D., Forth, A.E., & Hart, S.D. (1989). The psychopath as prototype for pathological lying and deception. In J.C. Yuille (Ed.),Credibility assessment(pp. 25-49). Norwell, MA: Kluwer Academic.

Harpur, T. J., Hare, R. D., & Hakstian, A. R. (1989). Two factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment*, 1(1), 6–17.

Hartwig, M., Granhag, P., Stromwall, L., & Vrij, A. (2004). Police officer's lie detection accuracy: Interrogating freely vs observing video. *Police Quarterly, 7*, 429–456. http://dx.doi.org/10.1177/1098611104264748.

Hicks, B., Marken, K., Patrick, C., Krueger, R, & Newman, S. (2004). Identifying psychopath subtypes based on personality structure. *Psychological Assessment*, 16(3), 276-288.

Falkenbach, D., Poythress, N., & Creevy, C. (2008). The exploration of subclinical psychopathic subtypes and the relationship with types of aggression, *Personality and Individual Differences*, 44, 821–832.

Jonason, P.K., Slomski, S., & Partyka, J. (2012). The Dark Triad at work: How toxic employees get their way. *Personality and Individual Differences, 52*(3), 449-453.

Johnson, M. K., & Raye, C. L. (1981). Reality monitoring. *Psychological Review, 88,* 67–85. http://dx.doi.org/10.1037/0033-295X.88.1.67

Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. (2002). Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology, 87,* 765–780.

Keating, C., & Heltman, K. (1994). Dominance and deception in children and adults: Are leaders the best misleaders? *Personality and Social Psychology Bulletin*, 20(3), 312-321. http://dx.doi.org.proxy.library.brocku.ca/10.1177/0146167294203009

King, W., & Dunn, T. (2010). Detecting deception in field settings. *Policing: An International Journal of Police Studies and Management,33,* 305–320. http://dx.doi.org/10.1108/13639511011044902.

Klaver, J., Lee, Z.,& Hart, S. (2007). Psychopathy and nonverbal indicators of deception in offenders. *Psychology, Crime & Law*, 14(1), 337-351.

Klaver, J., Lee., Z., Spidel., A., & Hart, S.(2009). Psychopathy and deception detection using indirect measures *Legal and Criminological Psychology*,14(1), 171-182.

Köhnken, G, Milne, R., Memon, A., & Bull, R. (1999). The cognitive interview: A meta-analysis. *Psychology, Crime & Law, 5*(1–2), 3–27. http://dx.doi.org/10.1080/10683169908414991

Kraut, R. E. (1980). Humans as lie detectors: Some second thoughts. *Journal of Communication, 30,* 209–218. http://dx.doi.org/10.1111/j .1460-2466.1980.tb02030.x.

Lee, Z., Klaver, J. R., & Hart, S. D. (2008). Psychopathy and verbal indicators of deception in offenders. *Psychology, Crime & Law,* 14(1), 73-84. doi:10.1080/10683160701423738

Levine, T.R. (2010), "A few transparent liars", in Soloman, C. (Ed.), Communication Yearbook,Sage, Thousand Oaks, CA.

Logue, M., Book, A. S., Frosina, P., Huizinga, T., & Amos, S. (2015). Using reality monitoring to improve deception detection in the context of the cognitive interview for suspects. *Law and Human Behavior, 39*(4), 360-367. doi:10.1037/lhb0000127.

Lord., R., De Vader, C., & Alliger, G. (1986). A meta-analysis of the relation between personality traits and leadership perceptions: An application of validity generalization procedures. *Journal of Applied Psychology,* 71(3), 402-410. http://dx.doi.org.proxy.library.brocku.ca/10.1037/0021-9010.71.3.402

Louth, S.M., Williamson, S., Alpert, M., Pouget, E.R., & Hare, R.D. (1998). Acoustic distinctions in the speech of male psychopaths. *Journal of Psycholinguistic Research*, 27, 375-384.

Lykken, D. T. (1995). *The antisocial personalities*. Hillsdale: Lawrence Erlbaum Associates, Inc.

Lyons, M., & Jonason, P.K. (2015). Dark Triad, tramps, and thieves: Psychopathy predicts a diverse range of theft-related attitudes and behaviors. *Journal of Individual Differences, 36,* 215-220.

Masip, J., Sporer, S., Garrido, E., & Herrero, C. (2005). The detection of deception with the reality monitoring approach: A review of the empirical evidence. *Psychology, Crime & Law, 11,* 99–122. http://dx.doi.org/10.1080/10683160410001726356

McCormack, T., Ashkar, A., Hunt, A., Chang, E., Silberkleit, G., & Geiselman, R. E. (2009). Indicators of deception in an oral narrative:Which are more reliable? *The American Journal of Forensic Psychiatry, 30,* 49–56.

McLeod, B. A., & Genereux, R. L. (2008). Predicting the acceptability and likelihood of lying: The interaction of personality with type of lie. *Personality and Individual Differences,* 45(7), 591-596. doi: http://dx.doi.org.proxy.library.brocku.ca/10.1016/j.paid.2008.06.015

Moltó, J., Poy, R., & Torrubia, R. (2000). Standardization of the Hare Psychopathy Checklist-Revised in a Spanish prison sample. *Journal of Personality Disorders,* 14, 84–96.

Pailing, A., Boon, J., & Egan, V. (2014). Personality, the Dark Triad and violence. *Personality and Individual Differences*, 67, 81-86. doi:10.1016/j.paid.2013.11.018

Paulhus, D. L., & Williams, K. M. (2002). The Dark Triad of personality: Narcissism, Machiavellianism and psychopathy. *Journal of Research in Personality*, 36(6), 556-563. doi: http://dx.doi.org.proxy.library.brocku.ca/10.1016/S0092-6566(02)00505-6

Poythress, N.G., Edens, J.F., & Watkins, M.M. (2001). The relationship between psychopathic personality features and malingering symptoms of major mental illness. *Law and Human Behavior*, 25, 567-582.

Rime, B., Bouvy, H., Leborgne, B., & Rouillon, F. (1978). Psychopathy and nonverbal behavior in an interpersonal situation. *Journal of Abnormal Psychology*, 87, 636-643.

Rogers, R., & Cruise, K. (2000). Malingering and deception among psychopaths. In C. B. Gacono (Ed.),The clinical and forensic assessment of psychopathy: A practitioner's guide (pp. 269–284). Mahwah, NJ: Erlbaum

Seto, M. C., Khattar, N. A., Lalumière, M. L., & Quinsey, V. L. (1997). Deception and sexual strategy in psychopathy. *Personality and Individual Differences*, 22, 301-307.

Skeem, J. L., Mulvey, E. P., Grisso, T., Skeem, J. L., Mulvey, E. P., & Grisso, T. (2003). Applicability of traditional and revised models of psychopathy to the psychopathy checklist: Screening version. *Psychological Assessment*, 15(1), 41-55. doi:10.1037/1040-3590.15.1.41

Skeem, J.L., Poythress, N., Eden, J., Lilinfeld, S. & Calle, E. (2003). Psychopathic personality or personalities? Exploring potential variants of psychopathy and their implications for risk assessment. *Aggression and Violent Behavior*, 8, 513-546.

Snyder, R. A., & Sutker, L. W. (1977). The measurement of the construct of dominance and its relationship to nonverbal behavior. *The Journal of Psychology: Interdisciplinary and Applied*, 97(2), 227-230.

Street, C. N. H., & Masip, J. (2015). The source of the truth bias: Heuristic processing? *Scandinavian Journal of Psychology*, 56(3), 254-263. doi:10.1111/sjop.12204

Stromwall, L., Hartwig, M., & Granhag, P. (2006). To act truthfully: Nonverbal behaviour and strategies during a police interrogation, *Psychology, Crime & Law*, 12, 207–219. http://dx.doi.org/10.1080/10683160512331331328.

Trovillo PV (1939) A history of lie detection. *J Crim Law Criminol* 29, 848–881.

Van Vugt, M. (2006). Evolutionary Origins of Leadership and Followership. *Personality and Social Psychology Review*, 10,(4), 354-371. doi: http://dx.doi.org.proxy.library.brocku.ca/10.1207/s15327957pspr1004_5

Vrij, A., & Granhag, P. A. (2012). Eliciting cues to deception and truth:What matters are the questions asked. *Journal of Applied Research in Memory & Cognition*, 1, 110–117. http://dx.doi.org/10.1016/j.jarmac.2012.02.004

Vrij, A., Mann, S., Leal, S., & Fisher, R. (2010).Look into my eyes': Can an instruction to maintain eye contact facilitate lie detection? *Psychology, Crime & Law*, 16, 327–348. http://dx.doi.org/10.1080/10683160902740633

Wheeler, S., Book, A., & Costello, K. (2009). Psychopathic traits and perceptions of victim vulnerability. *Criminal Justice and Behavior*, 36,(6), 635-648. doi: http://dx.doi.org.proxy.library.brocku.ca/10.1177/0093854809333958

Williamson, S.E. (1991). Cohesion and coherence in the speech of psychopathic criminals. Unpublished doctoral dissertation, University of British Columbia.

Williams, K. M., Nathanson, C., & Paulhus, D. L. (2003). Structure and validity of the self-report psychopathy scale-III in normal populations. In 111th annual convention of the American Psychological Association.

Chapter 5: General Discussion

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Collectively, the series of studies presented provide systematic and coherent evidence indicating that the specific combination of the Reality Monitoring scale and the Cognitive Interview for Suspects provides a consistent, effective, and robust method of increasing information gathered and detecting deception. Reality Monitoring was demonstrated to increase deception detection accuracy under strictly controlled experimental conditions. Further, this scale was demonstrated to be more accurate than subjective judgments provided by observers. This method was not affected by personality traits that have been linked to increased ability to deceive, namely psychopathy and social dominance. Finally, as originally hypothesized, the CIS was demonstrated to be an effective information gathering approach that significantly increased the amount of information gathered throughout the interview.

5.1 The Effectiveness of Reality Monitoring as a Deception Detection Tool

As argued in the Introduction, a potential source of the poor deception detection accuracy observed in the literature may be a consequence of reliance on nonverbal cues. Language-based methods of deception detection have consistently demonstrated accuracy ratings above chance; however, they are currently not sufficient to be used in legal proceedings (Vrij, 2005). The series of studies presented here provide evidence that the application of Reality Monitoring to CIS interviews led to a high degree of accuracy. The initial study of 157 students provided an accuracy rating of 86.6% (specificity = 90%, sensitivity = 83%) at the conclusion of the interview. Study 2 re-analyzed the full

sample using initial Reality Monitoring scores in conjunction with the difference scores of Reality Monitoring criteria between the first and last question of the CIS and demonstrated an accuracy rating of 88.5% (specificity = 89.7%, sensitivity = 87.3%). These results indicate that the Reality Monitoring scale is an accurate deception detection tool when applied to statements elicited by the CIS.

It is important to note that, consistent with Signal Detection Theory (Green & Swets, 1966), this method was able to accurately classify both truthful and deceptive statements. In Signal Detection Theory, developing methods to increase "Hits" often leads to an increase in "False Alarms". While it is important for law enforcement agencies to be able to accurately detect deception, there are negative consequences that may arise from incorrectly classifying truthful statements as deceptive. Given the stakes of police investigations, it is important to develop a detection method that can correctly classify both truth and lies. The goal of my thesis was to develop an effective interviewing method that increases deception detection accuracy without the corresponding increase in false alarms that often occurs. The method proposed in my thesis accurately detected deception with a high degree of sensitivity and specificity.

Further, Study 2 demonstrated the utility of calculating Reality Monitoring using the initial scores in conjunction with the difference scores of information reported during the first and last question of the CIS. The truthful participants were hypothesized to provide more Reality Monitoring criteria at baseline. The CIS was hypothesized to preferentially increase the amount of information recalled throughout the interview. Using the difference score not only increases overall accuracy, but allows for greater discrimination of truth and lies within given individuals. First, using difference scores

provides a direct, within-subject comparison of the statement instead of relying on group differences. Second, using the difference scores may allow for greater accuracy for people who are less verbose than others.

5.2 The Cognitive Interview for Suspects as an Information Gathering Tool

The collective body of research presented has demonstrated that the CIS is an appropriate information gathering approach that increases the quantity of details provided in a suspect interview. Study 1 demonstrated that truthful participants referenced more visual, auditory, spatial, and temporal details at the conclusion of the CIS than deceptive participants. Consistent with McCormack et al's. (2009) theory, deceptive individuals made more references to the cognitive processes of others. Analyses presented in Study 2 demonstrated that truthful participants provide significantly more Reality Monitoring details at the conclusion of the interview as compared to the initial question than deceptive individuals. Specifically, truthful participants demonstrated significantly greater increase in visual, auditory, temporal, and affective details provided at the conclusion of the interview compared to deceptive individuals. These results confirm the hypothesis that the CIS preferentially increases the recall of information provided by truthful participants and therefore it is an effective information gathering approach. However, it should be noted that the amount of information provided by deceptive individuals also increased from baseline in this interview, albeit at a much smaller rate than for truthful participants. The strict experimental controls provided in this study may explain this finding. Participants in both conditions met the same researchers and sat in

the same laboratory room. Therefore, although the sequence of events was different for the groups, the deceptive condition had numerous Reality Monitoring criteria cues to draw on to construct a believable alibi. Despite this confound, participants in the truthful condition demonstrated much higher increases in information provided in comparison to deceptive individuals, demonstrating the effectiveness of the CIS as an information gathering interview.

5.2.1 Interrogation vs Information Gathering Interviews

My dissertation demonstrates that information gathering approaches can lead to increased levels of deception detection accuracy under controlled experimental conditions in comparison to average accuracy rates reported in the literature. Further, it contributes to the debate between information gathering interviews and interrogation. As argued in the Introduction, the most popular method of suspect interviewing in North America is the Reid Technique (Snook, 2010). This method of interview has been criticized for its pursuit of confession rather than information. Reid and similar techniques have been criticized for determining deceptiveness using unreliable cues, and adopting coercive interviewing techniques that limit the amount of information gathered (Kassin & Fong, 1999; Vrij et al., 2006). Most alarmingly, this method has been linked to false confessions, particularly among vulnerable populations (Drizin & Leo, 2004; Kassin et al., 2010). Unfortunately, less coercive approaches such as the PEACE model have not been demonstrated to effectively increase the amount of information gathered or provide an effective method of detecting deception (Clarke, Milne, & Bull, 2011). A reasonable and more effective alternative may be required to move police services away from coercive interviews. The series of studies presented here provides evidence for the

use of this information gathering approach in police interviews. The CIS is an adapted form of a "best practice" model that has been adopted by police services globally. It has been demonstrated to increase the amount of information provided, particularly by truthful individuals. Finally, it has been demonstrated to increase the sensitivity of the Reality Monitoring scale.

5.3 Actuarial vs Subjective Measures of Deception

The studies presented demonstrated that Reality Monitoring was more accurate than subjective observer ratings in this sample. Study 2 directly compared the accuracy of observer ratings in comparison to Reality Monitoring in deception detection. Consistent with a large body of literature, observer ratings of deceptiveness hovered around chance levels of accuracy when rating the initial (52.73%) and final (47.82%) CIS responses. Further, observer ratings were significantly less accurate after viewing the second question ($t(389) = 4.75$, $p < .01$). Conversely, Reality Monitoring was more accurate, with a 92.5% overall accuracy rating in the same sample of interviews. These results support the specific combination of Reality Monitoring and the CIS to ensure accurate deception detection. Despite the increased information provided at the conclusion of the interview, observers were unable to accurately detect deception. These findings contribute to a large body of literature that indicates that objective ratings outperform subjective judgments in a variety of contexts (Garb, 1989).

5.3.1 Consistency as a Measure of Deception Detection

The study of observer ratings of deceptiveness provided further insight into potential sources of ineffective lie detection techniques. As previously discussed, observer ratings hovered around chance for both questions, but were significantly worse after viewing the second question. While the research literature has highlighted a general propensity to rely on ineffective body language cues (Depaulo et al., 2003), this method does not readily explain why observers would be significantly worse at rating questions after observing more body language cues. One potential source of error may be a measure of consistency. Qualitative data collected during Study 2 indicated that many observers compared the answers to the first and last question of the CIS to look for any inconsistencies in the story that would indicate deception. While this method has intuitive appeal, numerous studies have demonstrated that deceptive stories are not more inconsistent than true accounts after repeated tellings. In fact, certain studies have found that deceptive individuals are more consistent throughout their stories (Granhag & Stromwall, 2002; Blair et al., 2012). This finding may be compounded by the information gathering approach of the CIS. This method uses memory based-retrieval cues to increase the quantity of details recalled, particularly by truthful individuals. This increase in quantity of details may have been interpreted as a sign of deception by observers as the story grows and therefore changes throughout the interview.

5.4 The Effects of Personality Traits on Deception Detection

The collection of studies under examination contribute to the understanding of the effects of personality attributes of the deceiver on both subjective and objective ratings of deception. The empirical literature has provided mixed evidence on the effectiveness of psychopaths as effective liars. While certain studies have indicated an increased propensity for psychopaths to use deception in a variety of contexts, other researchers have not substantiated this link (Hare, Forth & Hart, 1989; Poythress, Edens, & Watkins, 2001). Further, while Hare (1993) has described psychopaths as "silver tongued swindlers," other researchers have found psychopathy to be linked to less coherent and convincing narratives. Researchers have argued that psychopaths use nonverbal cues to deceive others. A potential source of this conflict may be the lack of separation of psychopathy into separate factors. Lee, Klaver, and Hart (2008) argued that Factor 1 psychopathy was linked to increased deceptiveness, in contrast to Factor 2 psychopathy which was linked to increased perception of deceptiveness, regardless of whether the person was telling the truth.

In the present research, Reality Monitoring was hypothesized to be unaffected by psychopathic traits, as this scale focuses on verbal, not body language cues. Consistent with this theory, psychopathic traits were found to be unrelated to the ability to defeat Reality Monitoring, providing further support for the use of this scale. However, these results should be interpreted with caution, as only a small number of participants defeated the scale regardless of personality traits, thereby limiting experimental power. Interestingly, psychopathic traits were not linked to an increased ability to deceive observers. In fact, psychopathic traits, particularly Factor 2 psychopathy, was linked to

being seen as less believable by the end of the questioning, even when telling the truth. These findings provide partial support for Lee, Klaver, and Hart's (2008) suggestion that the underlying factor structure of psychopathy may lead to differential ability to deceive others. Specifically that Factor 2 psychopathy may be related to a decreased ability to deceive others over time. This may be explained by the finding that those high on Factor 2 are seen as less believable over time, making successful deception more difficult. Similarly, trait dominance was not linked to an ability to defeat the Reality Monitoring scale, providing further support for its use with the caveat of low power in this sample. This result was predicted as trait dominant individuals are believed to achieve influence using nonverbal rather than verbal cues. However, trait dominant individuals were rated as more believable over time by observers.

5.5 Limitations and Future Directions

The series of studies under examination provide support for the application of the Reality Monitoring scale to statements elicited by the CIS as an effective information gathering method that allows for accurate deception detection. This scale method has been demonstrated to be more effective than observer ratings and is not affected by psychopathic traits, or trait social dominance. Although this study has provided evidence for the use of language based deception detection techniques in combination with an information gathering interview, there are limitations that need to be addressed. First, it is important to note that this study used modified versions of Reality Monitoring and the CIS. Reality Monitoring initially began as a theory, and researchers have used different

subsets of 8 main criteria to create scales to measure deceptiveness. While there is no universal scale, Reality Monitoring often includes criteria such as: emotionalism, realism, coherence and vividness, in addition to direct references to sensory, spatial and temporal details reflected in a statement (Masip et al., 2005). In my thesis I chose to adopt the 6 criteria used by Vrij in a series of studies (Vrij et al., 2008; Vrij, Mann, Leal, & Fisher, 2010). This scale focuses on direct verbal references to visual, auditory, spatial, temporal, affective and cognitive details and does not consider subjective impressions of statements. The purpose of using these items was to limit subjectivity of judgment that may be challenged in court. While I believe that focusing on directly observable verbal criteria over subjective judgments will increase the probability that this method will be adopted by police services and accepted in court, it should be noted that a specific subset of criteria were used, which may limit the generalizability of these results to Reality Monitoring research.

Similarly, my thesis used a modified version of the CIS to interview participants in a mock theft scenario. I consciously chose to standardize the rapport building stage, and to eliminate the open ended, follow-up questioning that was recommended by Geiselman (2012). The purpose of using a standard written template read by a student interviewer with no follow-up questioning was to ensure that it was to ensure that it was the process, not the skill or beliefs of the interviewer that determined the results. The goal of this research is to develop an interviewing protocol that may be used by officers of all skill levels to increase the amount of information gathered and deception detection accuracy. While the protocol of this study was necessary to establish an initial effect, it should be noted that a modified version of the CIS was used, limiting the ability to

generalize from this study to the CIS as proposed by Geiselman (2012). Future research should consider the full CIS including an initial rapport building stage and open ended interview questions by trained investigators to determine the efficacy of this method. Interestingly, converging lines of research have provided a potential method of improving accuracy. Geiselman's CIS calls for a series of open ended questions in the middle of the interview. One of the more effective methods of deception detection noted in the literature is the "Strategic Use of Evidence" (Hartwig, Granhag, Stromwall & Kronkvist, 2006). There are cases in law enforcement interviews where investigators do have evidence that may implicate a suspect whom they are interviewing such as: fingerprints, DNA, or video surveillance. The literature on Strategic Use of Evidence has indicated that selectively introducing evidence throughout the interview increases deception detection accuracy over confronting the suspect with evidence at the beginning of the interview (Luke et al., 2016; Hartwig et al., 2006). This method appears to be compatible with the original CIS, and perhaps using "SUE" during the open-ended question phase would increase deception detection accuracy.

The decision to use a student interviewer and a written template provided a further limitation of the research. As previously stated, this protocol was used to ensure that the process, not the interviewer determined the results. Many research protocols involving interviewing allow for interviewers to control questioning, which provided difficulties in providing a comparison or control group for this study. A comparison to a "standard police interview" or alternative methods such as the Reid technique would have been confounded by the skill or beliefs of the interviewer. Now that initial effects have been established, future research should directly compare the CIS to alternative

interviews within the same study. Finally, a further limitation of the experimental design was the use of a single deception paradigm. The decision was made to conduct this study using a high number of participants in a single mock theft scenario, in order to demonstrate the validity of this approach in a large sample under controlled experimental conditions. The mock theft scenario utilized in this study was chosen to provide a high degree of empirical control. This study allowed for direct monitoring of the deception manipulation, and provided a strict test of Reality Monitoring by providing the deceptive participants with many cues to construct a believable alibi. This method had the further benefit of being used in multiple studies to provide a measure of between study comparison of deception detection accuracy. Future research should investigate this method using a variety of experimental manipulations of deception and comparing the effects of the CIS to competing interview methods.

Although this series of studies demonstrated initial promise, future avenues of research have been illuminated that would provide further direction to the development of this method. First, this method should be applied to "field studies." My dissertation adopted an experimental design that allows for empirical control and an established ground truth in order to demonstrate the validity of this protocol. However, numerous researchers have suggested that experimental studies may lack the ecological validity to determine effectiveness in real life scenarios (ten Brinke & Porter, 2012; Mortensen & Cialdini, 2010). Considering the stakes of real world criminal investigations, it may be difficult to begin with studies on CIS interviews with actual suspects of crime. However, because the CIS is adapted from the original Cognitive Interview that has been utilized for many years, it is conceivable that police departments may adopt this protocol with

witnesses in order to investigate the efficacy of this method. Reality Monitoring could be applied to CIS witness statements in a fashion similar to the original CBCA studies to determine the efficacy of this method.

A second area for future research in the field of deception detection involves the use of the CBCA in conjunction with the CIS. Criteria-Based Content Analysis is a competing form of language based deception detection techniques that has been comparable to Reality Monitoring in many studies (Masip et al., 2005). This method has been accepted and utilized in the court process for many years. The current dissertation proposes that Reality Monitoring may be more readily applicable to law enforcement for many reasons. First, the criteria are less ambiguous and more easily applied by officers. Second, references to cognitive processes of others may be indicative of deception (McCormack et al., 2009), and this criterion is a part of the Reality Monitoring scale. This is in contrast to the CBCA, which focuses on the probability that a statement is true. Further, Reality Monitoring lends itself better to the application of difference scores for deception detection. The highest level of accuracy achieved considered the pattern of information provided in the interview. It is unclear how CBCA criteria such as "realism" would be interpreted using difference scores. Despite these caveats, Criteria Based Content Analysis is a legitimate form of language based deception detection. Future research should consider the use of this scale on statements elicited by the CIS.

A relative weakness in the empirical literature on deception detection is the lack of consideration of the skill of the deceiver. While my dissertation attempted to bridge this gap by focusing on psychopathic traits and trait social dominance, further research is necessary. First, it should be noted that psychopathic traits were assessed in a student

sample, not using the PCL-R. The current experimental paradigm could be adapted to prison populations to determine whether psychopaths are able to defeat the RM scale. Additionally, while trait social dominance and psychopathic traits have not been demonstrated to effectively defeat the Reality Monitoring scale, it is possible that other personality traits might be more successful. Narcissism and Machiavellianism have been highlighted as potential personality traits that may lead to an increased ability to deceive. Narcissism is defined as grandiose sense of self-worth and entitlement. This trait has been linked to academic dishonesty (Baughman, Jonason, Lyons, & Vernon, 2014; Paulhus & Williams, 2002). Machiavellianism is characterized by a ruthless, cold and manipulative personality that pursues personal gain at the expense of others. These traits combine with psychopathy to form the dark triad, a personality style that has been linked to many negative behaviours. Machiavellianism has been linked to dishonesty in relationships, self-aggrandizing lies, and academic dishonesty (Azili et al., 2016; Brewer, Hunt, James, & Abell, 2015; McLeod & Genereux, 2008). Perhaps more importantly, this personality trait differs from psychopathy in that Machiavellianism is linked to an increased effort to tell a coherent and believable story. This personality trait may lead to an increased ability to defeat the Reality Monitoring scale. While the scale has proven to be effective thus far, further research must be conducted to determine whether it is susceptible to defeat by certain personality types.

Finally, this protocol relies on language base deception detection techniques. One potential area of future research would be the effectiveness of this method on individuals with differential skills in the language that the interview is conducted in. Studies have indicated that both police officers and lay persons are less accurate at classifying honest

and deceptive accounts of those interviewed in a second language, in comparison to native speakers (Leach, Snellings & Gazaille, 2017; Leach and Silva, 2013). Potentially, this effect may be maintained during this protocol, as those who are interviewed in a second language may not be as descriptive during their accounts. One method of addressing this concern would be to use the difference scores from initial test to baseline to determine the relative improvement, however future research should investigate this issue. Similarly, relying on a language based approach may have some limitations when considering the statements of special populations, such as cognitive delay or dementia. The original CI has been demonstrated to increase the amount of information recalled for people of various age groups and cognitive deficiencies, and therefore the modified CIS is hypothesized to provide similar results (Fisher et al., 2000 Robinson & McGuire, 2006; Wright & Holliday, 2007). However, future research should directly test the efficacy of this method in these populations.

5.6 Conclusion

Collectively, the series of studies presented provide evidence that the combination of Reality Monitoring and the CIS is a potentially effective method of police interviewing that allows for increased information gathering and improved deception detection accuracy. The CIS has been derived from a best practice model that has been used by police services across North America. It does not rely on coercive strategies or behavioural based deception detection techniques that have been criticized in the empirical literature. Further, the studies presented demonstrate that this method of

interviewing increases the quantity of details provided. Reality Monitoring has been demonstrated to outperform subjective observer judgments of deception. Further, considering the pattern of information provided throughout the interview appears to lead to an increased degree of accuracy of the scale. Finally, this method has been demonstrated to be robust against personality traits that are linked to influence and deception; trait social dominance and psychopathy. Future research should expand the study of this protocol using field tests, comparing Reality Monitoring to the CBCA, and considering the effect of other personality types of the interviewee on the deception detection accuracy of the Reality Monitoring scale.

5.7 References

Baughman, H., Jonason, P., Lyons, M., & Vernon, P. (2014). Liar, liar, pants on fire: Cheater strategies linked to the dark triad. *Personality and Individual Differences*, 71, 35-38.

Blair, J. P., Levine, T. R., Reimer, T. O., & McCluskey, J. D. (2012). The gap between reality and research. *Policing: An International Journal of Police Strategies & Management, 35* (4), 723-740. doi:10.1108/13639511211275553.

Bond, C. F., Jr., & DePaulo, B. M. (2006). Accuracy of Deception Judgments. *Personality and Social Psychology Review*, 10(3), 214-234. doi:10.1207/s15327957pspr1003_2.

Brewer, G., Hunt, D., James, G., & Abell, L. (2015). Dark triad traits, infidelity and romantic revenge. *Personality and Individual Differences*, 83, 122-127. doi:10.1016/j.paid.2015.04.007.

Clarke, C., Milne, R., & Bull, R. (2011). Interviewing suspects of crime: The impact of peace training, supervision and the presence of a legal advisor. *Journal of Investigative Psychology and Offender Profiling*, 8(2), 149-162. doi:10.1002/jip.144

Dando, C., Wilcox, R., & Milne, R. (2009).The cognitive interview: The efficacy of a modified mental reinstatement of context procedure for frontline police investigators. *Applied Cognitive Psychology*, 23, 138–147.

Depaulo, B., Malone, B., Lindsay, J., Mulhenbruck, L., Charlton, K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin*, 129(1), 74-118.

Drizin, S. A., & Leo, R. A. (2004). The problem of false confessions in the post dna world. *North Carolina Law Review*, 82, 891-1004.

Fisher, R.P., Falkner, K,L., Trevisan, M., & McCauley, M. (2000). Adapting the Cognitive Interview to Enhance Long-Term (35 Years) Recall of Physical Activities. *Journal of Applied Psychology*, 85(2), 180-189.

Garb, H. N. (1989). Clinical judgment, clinical training, and professional experience. *Psychological Bulletin*, *105*, 387–396. http://dx.doi.org/10.1037/0033-2909.105.3.387

Geiselman, R. E., Fisher, R. P., Firstenberg, I., Hutton, L. A., Sullivan, S. J., Avetissian, I.,and Prosk, A. (1984). Enhancement of eyewitness memory: an empirical evaluation of the cognitive interview. *Journal of Police Science and Administration*, 12, 74-80.

Hare, R. D. (1993*). Without Conscience: The disturbing world of psychopaths among us*. New York: NY, Pocket books.

Hare, R.D., Forth, A.E., & Hart, S.D. (1989). The psychopath as prototype for pathological lying and deception. In J.C. Yuille (Ed.),Credibility assessment(pp. 25-49). Norwell, MA: Kluwer Academic.

Hartwig, M., Granhag, P. A., Strömwall, L. A., Kronkvist, O., Hartwig, M., Granhag, P. A., Kronkvist, O. (2006). Strategic use of evidence during police interviews: When training to detect deception works. *Law and Human Behavior, 30*(5), 603-619. doi:10.1007/s10979-006-9053-9

Hartwig, M., Granhag, P., Stromwall, L., &Vrij, A.(2004). Police officer's lie detection accuracy: Interrogating freely vs observing video. *Police Quarterly*, 7(4), 429-456.

Kassin, S. M., Drizin, S. Grisso, T., Gudjonsson, G. H., Leo, R. A., & Redlich, A. D. (2010). Police-induced confessions: Risk factors and recommendations. *Law and Human Behavior*, *34*, 3–38. http://dx.doi.org.proxy.library.brocku.ca/10.1007/s10979-009–9188-6.

Kassin, S. M., & Fong, C. T. (1999). "I'm innocent!": Effects of training on judgments of truth and deception in the interrogation room. *Law and Human Behavior*, 23(5), 499-516. doi:10.1023/A:1022330011811.

King, W. & Dunn, T. (2010). Detecting deception in field studies. *Policing: An International Journal of Police Studies and Management*, 33(2), 305-320.

Leach, A., Snellings, R. L., & Gazaille, M. (2017). Observers' language proficiencies and the detection of Non□native speakers' deception. *Applied Cognitive Psychology, 31*(2), 247-257. doi:10.1002/acp.3322

Leach, A., & Silva, C. (2013). Language proficiency and police officers' lie detection performance. *Journal of Police and Criminal Psychology*, *28*(1), 48-53. doi:10.1007/s11896-012-9109-3

Lee, Z., Klaver, J. R., & Hart, S. D. (2008). Psychopathy and verbal indicators of deception in offenders. *Psychology, Crime & Law,* 14(1), 73-84. doi:10.1080/10683160701423738.

Luke, T., Hartwig, M., Joseph, E., Brimbal, L., Chan, G., Dawson, E., Granhag, P. (2016). Training in the strategic use of evidence technique: Improving deception detection accuracy of american law enforcement officers. *Journal of Police and Criminal Psychology,* 31(4), 270-278. doi:10.1007/s11896-015-9187-0

Mann, S., Vrij, A., & Bull, R. (2002). Suspects, lies and videotape: an analysis of authentic high-stakes liars. *Law & Human Behavior*, 26, 365–376.

McCormack, T., Ashkar, A., Hunt, A., Chang, E., Silberkleit, G., & Geiselman, R.E. (2009). Indicators of deception in an oral narrative: Which are more reliable? *American Journal of Forensic Psychiatry*, 30, 49-56.

McLeod, B. A., & Genereux, R. L. (2008). Predicting the acceptability and likelihood of lying: The interaction of personality with type of lie. *Personality and Individual Differences*, 45(7), 591-596. doi:http://dx.doi.org.proxy.library.brocku.ca/10.1016/j.paid.2008.06.015]

Mortensen, C., & Cialdini, R. (2010). Full-cycle social psychology for theory and application. *Social and Personality Psychology Compass, 4,* 53–63. http://dx.doi.org/10.1111/j.1751-9004.2009.00239.x.

Paulhus, D. L., & Williams, K. M. (2002). The Dark Triad of personality: Narcissism, Machiavellianism and psychopathy. *Journal of Research in Personality*, 36(6), 556-563. doi: http://dx.doi.org.proxy.library.brocku.ca/10.1016/S0092-6566(02)00505-6.

Poythress, N.G., Edens, J.F., & Watkins, M.M. (2001). The relationship between psychopathic personality features and malingering symptoms of major mental illness. *Law and Human Behavior*, 25, 567-582.

Robinson, J. & McGuire, J. (2006). Suggestibility and children with mild learning disabilities: The use of the cognitive interview. *Psychology, Crime & Law*, 12(5), 537-556.

Snook, B., Eastwood, J., Stinson, M., Tedeschini, J., & House, J. C. (2010). Reforming Investigative Interviewing in Canada. *Canadian Journal of Criminology and Criminal Justice, 52*(2), 215–229. http://dx.doi.org/10.3138/cjccj.52.2.215

ten Brinke, L., & Porter, S. (2012). Cry me a river: Identifying the behavioral consequences of extremely high-stakes interpersonal deception. *Law and Human Behavior, 36,* 469–477. http://dx.doi.org/10.1037/h0093929

The Global Deception Research Team. (2006). A World of Lies. *Journal of Cross-Cultural Psychology*, 37(1), 60-74. doi:10.1177/0022022105282295

Vrij, A. (2005). Criteria-based content analysis: A review of the first 37 studies. *Psychology, Public Policy and Law*, 11(1), 3-41.

Vrij, A. (2006). Challenging interviewees during interviews: The potential effects on lie detection. *Psychology, Crime & Law*, 12(2), 193-206.

Vrij, A. (2008). Nonverbal dominance vs verbal accuracy in lie detection: A plea to change policing practice. *Criminal Justice and Behaviour*, 35(10), 1323-1336.

Vrij, A., & Mann, S. (2006). Criteria-Based Content Analysis: An empirical test of its underlying processes. *Psychology, Crime & Law*, 12(4), 337-349.

Vrij, A., Mann, S., Leal, S. & Fisher, R.(2010). 'Look into my eyes': can an instruction to maintain eye contact facilitate lie detection? *Psychology, Crime & Law*,16(4), 327-348.

Wright, A., & Holliday, R. (2007). Interviewing cognitively impaired older adults: How useful is a Cognitive Interview? *Memory*, 15(1), 17-33.

Appendix A: Study 1 Informed Consent

INFORMED CONSENT

Date:
Project Title: Deception Detection in Interrogation

Principal Student Investigator (PSI): Michael Logue (Ph.D. Candidate)
Department of Psychology
Brock University
Ml10da@brocku.ca

Faculty Supervisor: Angela Book
Department of Psychology
Brock University (905) 688-5550 Ext. abook@brocku.ca

INVITATION

You are invited to participate in a study being conducted by Michael Logue (Principal Student Researcher), Shelby Amos, Paul Frosina, Tylor Huizinga, and Rachel Cole under the supervision of Dr. Angela Book. We are interested in how people tell stories about their experiences, and how convincing these stories are to other people.

WHAT'S INVOLVED

As a participant, you will be asked to perform a variety of tasks, including filling out a brief questionnaire, reading stories, participating in games and answering questions based on your experience. Certain portions of this study will be video recorded. Participation will take approximately 1 hour of your time.

POTENTIAL BENEFITS AND RISKS

Depending on how convincing your story is, you can earn up to $10. Further, you are able to use your participation as part of course requirements in classes such as Psychology 1F90. There also may be risks associated with participation. You may feel uncomfortable during the interview portion of the study, and if you should feel this way, you can immediately inform the interviewer, at which point the interview will end and you can discontinue participation. If you are still uncomfortable, the researchers have provided information on the counseling services available at Brock on the Debriefing Sheet that you will receive at the end of this session.

CONFIDENTIALITY

When participating in this study, you will be asked to identify yourself with your first name to speak to the researcher. Data will be collected using arbitrary numbers, and your

name will not be linked with the data you provide or appear in any publications. All information you provide is considered confidential; your name will not be included or, in any other way, associated with the data collected in the study. Furthermore, because our interest is in the average responses of the entire group of participants, you will not be identified individually in any way in written reports of this research. Because some portion of the session will be videotaped, there is the possibility that you will be recognized by people in a future study who will be rating the videos on how convincing the story is. We have a separate video consent form where you can choose whether your video is used for a) the present study, where only the researchers will see the video, b) a future study, where the videos will be rated by others, or c) not for any purpose, at which point the video would be deleted in front of you.

Data collected during this study will be stored on laboratory computers for using case numbers. Only the researchers listed on this consent form will have access to these materials. Data will be kept for 5 years following publication, as stipulated by the American Psychological Association after which time the files will be erased. Video data will be retained for 5 years following publication of the future study, but only if you have agree to have your video used for this purpose.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time and may do so without losing the credit for participation. However, because the $10 is dependent upon how convincing your story is, you can only get the money if the story part of the session has been completed.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available. Please contact the principal investigator, Michael Logue, regarding the results of this study.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact Michael Logue using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (file # 12-60). If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

Thank you for your assistance in this project. Please keep a copy of this form for your records.

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: _____

Signature: _____ Date: _____

Appendix B: Deception Detection in Interrogation: Photograph/Video Consent Form

This study has received ethical approval (REB file #12-060). It is being conducted by Michael Logue, Paul Frosina, Shelby Amos, and Tylor Huizinga under the supervision of Dr. Angela Book (abook@brocku.ca).

Please indicate below which purposes you would like the video recording to be used for:

1. Coding for the present study

I agree to have my video coded for verbal and nonverbal behaviors by the researchers listed on the consent and debriefing forms.

_____ _____

Participant Signature Date

I do not agree to have my video coded for verbal and nonverbal behaviors by the researchers listed on the consent and debriefing forms.

_____ _____

Participant Signature Date

2. Future Study

I agree to have my video used in a future study where participants will rate the story on deception/truth.

_____ _____

Participant Signature Date

I do not agree to have my video used in a future study where participants will rate the story on deception/truth.

_____ _____

The signature below verifies that I, the researcher for *Deception Detection in Interrogation*, will abide by your video recording request and operate in accordance with the above statement(s).

_____ _____

Researcher Signature Date

Appendix C: Study 1 Alibi Template

"You entered the room and played a few games of connect four with [researcher two]. *Connect four is a board game similar to tic-tac-toe played with discs similar to checkers pieces. The goal of the game is to be the first to line up 4 pieces on the board while taking alternating turns. A short time later,* [researcher one], *who shares the laboratory, enters the room and you all have a brief conversation and he leaves. The game continues until* [researcher two] *receives a phone call and leaves the room before returning. The game continues until* [research confederate] *comes back into the lab and locates the wallet that is on the desk. This person opens the wallet, and claims that there is $10 missing*." *"The wallet is sitting on the table in the corner of the room. Take the $10 out of the wallet. You will be interviewed by a separate person to determine whether you took the $10. If you convince the interviewer that you did not take the money, you will get to keep the $10"*

Appendix D: Cognitive Interview for Suspects Script

Stage 1: Rapport Building

As you know my lab-mate (Researcher 2) is missing money, and we just want to find out what happened. I am not necessarily blaming you, but I would like you to provide me a story that makes sense so I can understand what happened in the previous room. Before we start, I would like to learn a little more about you, so that I have an idea of who I am dealing with. I would like you to answer a few questions, not about what happened, but about yourself to get to know you better.

1.) What did you do last weekend? Mention all details and give as much information as you can.

2.) Where do you see yourself 5 years from now? Mention all details and give as much information as you can.

Ok, now that I know a little more about you, I would like to start with the interview when you are ready.

Stage 2: CIS Questions

1) 'Please tell me, in as much detail as possible, what happened when you were in the room with (Researcher 1) just now? Mention all details, all conversations that took place, and give as much information as you can about everyone who entered the room, however irrelevant it may seem. Please tell me as much as you possibly can as I will use all the information you give me to decide whether or not I think you are telling me the truth.'

After a short break participants will then be asked:

2) Here is a sketch pad with a piece of paper in front of you. 'Please tell me, in as much detail as possible, what happened when you were in the room with (Researcher 1) just now? Mention all details, all conversations that took place, and give as much information as you can about everyone who entered the room, however irrelevant it may seem. Use the sketch pad to demonstrate what happened in the room with (Researcher 1), in what order, and show me where you were in the room. Please tell me as much as you possibly can as I will use all the information you give me to decide whether or not I think you are telling the truth.

The sketch pad will be removed and Participants will then be asked the following question:

3) 'Please tell me, in as much detail as possible, what happened when you were in the room with (Researcher 1) just now, but in reverse order. This means I would like you to start with opening the door to meet me, and work your way backwards, in order, to when you originally met (Researcher 1). Mention all details, all conversations that took place,

and give as much information as you can about everyone who entered the room, however irrelevant it may seem. Please tell me as much as you possibly can as I will use all the information you give me to decide whether or not I think you are telling me the truth. Participants will then be challenged on their statements with the following question:

4) I have listened to all of your answers and at this point there are inconsistencies in your story. I think you have been lying to me this entire time. Please tell me again what happened in the room with (Researcher 1). Mention all details all conversations that took place and give me as much information as you can about everyone who entered the room, however irrelevant it may seem as I will use all the information you give me to decide whether or not I think you are telling the truth.

Participants will then be asked the following question.

5) Now that you have answered the previous questions, I will again ask you to tell me your story in a way that is believable to me. Please tell me in as much detail as possible, what happened when you were in the room with (Researcher 1). Mention all details all conversations that took place and give as much information as you can about everyone who entered the room, however irrelevant it may seem as I will use all the information you give me to decide whether or not I think you are telling me the truth. It is very important that you tell me all of the information that you told me throughout the interview, even if you have mentioned these things in previous questions, as well as anything else you would like to add. This will be your last chance to convince me that you are telling the truth.

Appendix E: Reality Monitoring Scoring Sheet

Participant Number:

	Question 1	Question 2	Question 3	Question 4	Question 5
Visual					
Audio					
Spatial					
Temporal					
Cognitive					
Affective					

Appendix F: Study 1 Debriefing Form

Deception Detection in Interrogation Participant ID: _____

Thank you for participating in this research project. This research was conducted through the Psychology Department at Brock University and carried out by researcher Michael Logue, Paul Frosina, Shelby Amos, Tylor Huizinga, and Rachel Cole under the supervision of Dr. Angela Book. The study has been reviewed and received ethical clearance through the Research Ethics Board at Brock University (REB file #12-060).

The purpose of this study is to further the current understanding of lie detection. Despite popular media myths, physical cues such as body language, rate of speech and pupil dilation are not reliably linked to deception. The failure of these techniques has led researchers to abandon non verbal methods of deception detection in favour of verbal cues. There are various methods of verbal lie detection, and the purpose of this study is to test one method, the cognitive interview. Some participants in this study actually participated in a brief scenario where they played games of Connect 4, met 2 other people, and one of the other people lost $10 from a wallet. The other participants were provided a similar script covering the main events of the scenario that they could use to construct an alibi. Some of these participants were directed to take the $10 out of the wallet and some were not. All participants were brought into the interview room and asked the same questions in the same order. The interviewer was asked to rate if they felt participants had actually experienced the event or were in the alibi group. Researchers have developed scales that they apply to statements that can be used to help determine whether a person is telling the truth. At a later date, these scales will be applied to the video of these interviews to determine if these measures can detect deception. This research has practical applications for law enforcement. If this interviewing technique and the assessment scales can accurately detect deception, police officers may be able to more accurately determine whether a witness or suspect is telling the truth and may be able to arrest the guilty party in a more efficient fashion. We will also be having another sample of participants rate the videos on deception/truth, if you have agreed to this on the video consent form. We apologize that we were unable to reveal the purpose of the study in the beginning of the session, however, in order to determine whether this method works, it is important that all participants demonstrate their natural reactions without prior preparation and expectations. The scenario and alibi stories were necessary to ensure the accuracy of the events, and to ensure that the interviewer was speaking to people who were talking about the same event. The scenario is necessary to test the cognitive interview in a setting that may be similar to real life.

The videotape that was collected will be coded for a variety of characteristics that are associated with truth in witness statements. If you consented for your data to be utilized in further studies, that means that collected videotapes could be shown and rated for how convincing the story was by student and community samples, at a later date.

Your participation was voluntary, and all data (including the videotape) will be deleted/destroyed in your presence should you withdraw your consent during the session. Should you decide at a later date that you would like to withdraw your participation, please retain this debriefing form (with the participant ID on it), and refer to the number when asking for your data/video to be deleted. If you should ask to withdraw, all materials will be deleted/destroyed at that time.

We apologize if you were uncomfortable at any time during the interview. It was not the intention of any member of the study to make you feel guilty. The study was conducted in a manner similar to the cognitive interview which is used for victims, independent witnesses, and now potentially, suspects.

Thank you for your participation in our research. Again, information that you gave was completely confidential. In the event that you have any complaints, concerns or questions about the research, please feel free to contact Dr. A. Book, (905-688-5550, ext: 5223). You may also contact the Research Ethics Officer (email: reb@brocku.ca or telephone: 905-688-5550, ext: 3035), who can provide answers to pertinent questions about the research participants' rights.

For the benefit of this research, we ask that the true nature of this study be kept confidential and that you not discuss the content or deception involved in this study with other students, as awareness among other students could contaminate results.

Sincerely

Michael Logue.

Information for Counselling Services:

http://www.brocku.ca/personal-counselling

Les McCurdy-Myers, lmccurdy@brocku.ca

Phone: 905-688-5550, ext. 4750

Appendix G: Study 2 and 3 Observer Ratings of Deception Scale

Please rate the story in each video on the following scale and make a judgment as to whether you think they are telling the truth or being deceptive. Please also use the following six-point scale to indicate how confident you are in your judgments for each video. A rating of 1 indicates "Not at all confident" and a rating of 6 indicates "Very confident".

1	2	3	4	5	6
Very Untruthful	Untruthful	Slightly Untruthful	Slightly Truthful	Truthful	Very Truthful

	Rating 1	Truth/ Deception	Confidence Rating 1	Rating 2	Truth/ Deception	Confidence Rating 2
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

Appendix H: SRP-III

Please rate the degree to which you agree with the following statements about you.

1	2	3	4	5
Disagree Strongly	Disagree	Neutral	Agree	Agree Strongly

1. I'm a rebellious person. _____

2. I'm more tough minded than other people. _____

3. I think I could "beat" a lie detector. _____

4. I have taken illegal drugs (e.g., marijuana, ecstasy). _____

5. I have never been involved in delinquent gang activity._____

6. I have never stolen a truck, car, or motorcycle. _____

7. Most people are wimps. _____

8. I purposely flatter people to get them on my side. _____

9. I've often done something dangerous just for the thrill of it. _____

10. I have tricked someone into giving me money. _____

11. It tortures me to see an injured animal. _____

12. I have assaulted a law enforcement officer of social worker. _____

13. I have pretended to be someone else in order to get something. _____

14. I always plan out my weekly activities. _____

15. I like to see fist fights. _____

16. I'm not tricky or sly. _____

17. I'd be good in a dangerous job because I make fast decisions. _____

18. I have never tried to force someone to have sex. _____

19. My friends would say that I am a warm person. _____

20. I would get a kick out of ‘scamming’ someone. _____

21. I have never attacked someone with the idea of injuring them. _____

22. I never miss any appointments. _____

23. I avoid horror movies. _____

24. I trust other people to be honest. _____

25. I hate high speed driving. _____

26. I feel so sorry when I see a homeless person. _____

27. It’s fun to see how far you can push someone before they get upset. _____

28. I enjoy doing wild things. _____

29. I have broken into a building or vehicle in order to steal something or vandalize. _____

30. I don’t bother to keep in touch with my family anymore. _____

31. I find it difficult to manipulator. _____

32. I rarely follow the rules. _____

33. I never cry at movies. _____

34. I have never been arrested. _____

35. You should take advantage of other people before they do it to you. _____

36. I don’t enjoy gambling for real money. _____

37. People sometimes say that I’m cold hearted. _____

38. People can usually tell if I am lying. _____

39. I like to have sex with people I barely know. _____

40. I love violent sports and movies. _____

41. Sometimes you have to pretend you like someone to get something out of them._____

42. I am an impulsive person. _____

43. I have taken hard drugs (e.g., heroin, cocaine). _____

44. I'm a soft hearted person. _____

45. I can talk people into anything. _____

46. I never shoplifted from a store. _____

47. I don't enjoy taking risks. _____

48. People are too sensitive when I tell them the truth about themselves. _____

49. I was convicted of a serious crime. _____

50. Most people tell lies every day. _____

51. I keep getting in trouble for the same things over and over. _____

52. Every now and then I carry a weapon (knife or gun) for protection. _____

53. People cry way to much at funerals. _____

54. You can get what you want by telling people what they want to hear. _____

55. I easily get bored. _____

56. I never feel guilty over hurting others. _____

57. I have threatened people into giving me money, clothes or makeup. _____

58. A lot of people are "suckers" and can easily be fooled. _____

59. I admit that I "mouth off" without thinking. _____

60. I sometimes dump friends when I don't need any more. _____

61. I would never step on others to get what I want. _____

62. I have close friends who served time in prison. _____

63. I purposely tried to hit someone with a vehicle I was driving. _____

64. I have violated my probation from prison. _____

Appendix I: SSSS Questionnaire

Indicate the degree to which you disagree or agree with each statement below by writing a number between 1 and 7 in the space provided.

1	2	3	4	5	6	7
Strongly Agree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

____ Members of my peer group respect and admire me.

____ Others do not value my opinion. (R)

____ Members of my peer group do not want to be like me. (R)

____ I have gained distinction and social prestige among my peers.

____ I am held in high esteem by those I know.

____ Others always expect me to be successful.

____ There are some matters on which I am considered an expert by others.

____ My unique talents and abilities are recognized by others.

____ I am willing to use aggressive tactics to get my way.

____ I enjoy having control over others.

____ I do not like to give orders. (R)

____ I often try to get my own way regardless of what others may want.

____ I try to control others rather than permit them to control me.

____ I don’t have a forceful or dominant personality. (R)

____ Others know it is better to let me have my way.

____ I do not enjoy having authority over other people. (R)

Appendix J: Study 2 and Study 3 Informed Consent

Informed Consent

Date:
Project Title: **Catch Me If You Can!**

Principle Student Investigator (PSI): Michael Logue (Ph.D. Candidate)
Department of Psychology
Brock University
Ml10da@brocku.ca

Faculty Supervisor: Angela Book
Department of Psychology
Brock University
(905) 688-5550 Ext.5223
abook@brocku.ca

INVITATION

You are invited to participate in a research study being conducted by researchers including Michael Logue (Principal Student Researcher), under the supervision of Dr. Angela Book. We are interested in how accurate people are in judging deception in others, and how that relates to personality traits. The study has been reviewed and received ethical clearance through the Research Ethics Board at Brock University (REB file # 14-043).

WHAT'S INVOLVED

As a participant, you will be asked to view 20 videos of people telling true and false stories in an interrogation experiment. After each video (1 to 2 minutes in length), you will be asked to rate the believability of the story. After watching and rating these videos, you will be asked to complete a short personality questionnaire (5 to 10 minutes) that includes questions about antisocial behaviors. Participation will take approximately 1 hour of your time.

POTENTAL BENEFITS AND RISKS

There are no known or foreseeable risks associated with participation in this study. The results of this study may provide important information regarding deception detection in interrogation contexts, and may be of interest to the field of law enforcement in the future. While results will not directly be shared with law enforcement, we will be publishing in journals that exame the intersection of psychology within the legal system.

COMPENSATION

You are able to use your participation as part of course requirements in classes such as Psychology 1F90 and other Psychology of courses that have this requirement. In total, you will receive 1 hour of research participation credit.

CONFIDENTIALITY

All the data collected in this study will be identified using arbitrary numbers, and your name will not be linked with the data you provide or appear in any publications. All information you provide is considered confidential; your name will not be included, or in any other way be associated with data collected in this study. Furthermore, because our interest is in the average responses of the entire group of participants, you will not be identified individually in any way in written reports of this research.

Because the video clips were also collected at Brock, there is the possibility that you may recognize a participant from the first study. All people who were videotaped consented to having their stories rated for believability and were aware of the possibility of being recognized under the understanding that future participants would be asked to maintain their confidentiality. Please do not discuss this study with others and refrain from breaking the confidentiality of previous and present participants.

Data collected in this study will be stored on password protected computers within the locked laboratory of Dr. Angela Book. Only researchers in the laboratory of Dr. Angela Book will have access to the data, which will be kept for 7 years following publication, as stipulated by the American Psychological Association, after which time the data will be erased.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from the study at any time and do so without losing the appropriate credit for participation (1/2 hour participation = 1/2 hour credit). Because your data will be assigned an arbitrary number, it is only possible to withdraw from the study until you have left the session. After that , it will not be possible, as we will not be able to link your name to your participant identification number.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and at conferences. Feedback on this study will be available by Fall 2015. Please contact the principle investigator, Michael Logue, regarding this study.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact Michael Logue using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University. If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 ext. 3035, reb@brocku.ca

Thank you for your assistance in this project. Please keep a copy of this form for your records.

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Informed-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I can withdraw my consent at any time.

Name: _____

Signature: _____

Date: _____

Appendix K: Study 2 and Study 3 Debriefing Sheet

Catch Me If You Can!

Thank you for participating in this research project. This research was conducted through the Psychology Department at Brock University and carried out by Michael Logue and researchers under the supervision of Dr. Angela Book. The study has been reviewed and received ethical clearance through the Research Ethics Board at Brock University (REB file # 14-043).

The purpose of this study is to further the current understanding of lie detection. You viewed 20 videos (1 to 2 minutes in length) and were asked to rate the truthfulness/believability of each story. Some of the stories were true, while others were false. Despite popular media myths, lie detection through observation has not been shown to be accurate, although law enforcement manuals still emphasize the use of body language cues to judge deception in an interrogation context (Hartwig, Granhag, Stromwall & Vrij, 2004; Geiselman, 2012). We hope to compare the accuracy rates from subjective judgments (your ratings after observing part of the interview) to the accuracy of a validated and standardized deception detection tool called Reality Monitoring. This research has practical applications to law enforcement. If the assessment scales more accurately detection, police officers may be able to more accurately determine whether a witness or suspect is telling the truth.

We were also interested in whether personality (specifically, the tendency to engage in antisocial behaviors) is related to the ability to judge deception in others. If so, this would support current perspectives that antisocial traits may enable deception and cheating detection.

Your participation was voluntary and you were free to withdraw your consent at any point during the session. You were able to use your participation for 1 hour of credit in applicable courses (e.g. Psychology 1F90).

Thank you for your participation in our research. Again information that you gave was completely confidential. In the event that you have any complaints, concerns or questions about the research please feel free to contact Dr. Angela Book (905-688-5550, ext.5223). You may also contact the Research Ethics Officer (email: reb@brocku.ca or telephone: 905-688-5550, ext: 3035) who can provide answers to pertinent questions about the research participant's rights.

Sincerely
Michael Logue