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Strategic Approaches To Lying: Understanding Their Impact On Psychological Processes, Cues To Deception, And Perceptions Of Observers

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STRATEGIC APPROACHES TO LYING: UNDERSTANDING THEIR IMPACT ON
PSYCHOLOGICAL PROCESSES, CUES TO DECEPTION, AND PERCEPTIONS OF
OBSERVERS

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2013

Dedication

This dissertation is dedicated to my amazing parents, Douglas and Miriam Michael.

Thank you.

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PSYCHOLOGICAL PROCESSES, CUES TO DECEPTION, AND PERCEPTIONS OF
OBSERVERS

By

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Abstract

The current research examined the strategies implemented by liars, the relationships between these strategies and psychological processes related to deception, and the implications of these associations on perceptions of deceptive statements. In general, deception research has either ignored or superficially examined the types of strategies that individuals use to construct lies. However, these strategies may have significant impact on characteristics of the lie itself, and in turn, perceptions of the lie.

Study 1 explored the various strategies that liars use and the association of these strategies to psychological processes involved in lying. Results demonstrated that participants used a wide range of strategies. Some relied solely on gist memory, others on verbatim, and others involved a mix of these forms of memory. There was also a relationship between this type of strategy and cognitive difficulty, where lying was easier for participants who used more truthful events in their statement. Study 2 assessed the effects of two specific lying strategies on perceptions of these statements: displacements (using verbatim) and novel lies (using gist). Results found that displacement lies contained higher levels of detail and more cognitive operations than novel lies. Study 3 then examined whether behavioral differences in the two types of lies led to differences in deception detection rates, finding that lie accuracy was significantly greater for novel lies than displacements. It appears that because displacements, compared to novel lies, are more similar to truths (e.g., they rely on actual experiences and require fewer cognitive resources), the cues displayed when using displacement make the statement appear more like truths than novel lies. This in turn makes it more difficult to identify displacements in comparison to novel lies.

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Chapter 1: General Introduction

Several theories have been developed to explain the various psychological processes that differentiate lies and truths (Vrij, 2008). Research has attempted to link these processes to behavioral cues that individuals are expected to exhibit when telling a lie (vs. a truth) and that, in turn, might be used to discriminate between deceptive and truthful statements. Unfortunately, research has found that such cues have relatively small and inconsistent effects on veracity (DePaulo, Lindsay, Malone, Muhlenbruck, Charlton, & Cooper, 2003). Furthermore, the average individual detects deception with just slightly above chance accuracy (54%; Bond & DePaulo, 2006). Thus, while psychological processes can explain why differences between liars and truth tellers *should* emerge and facilitate detection, these predictions have not translated into successful practice.

Two issues may account for this disconnect. First, while researchers have used various psychological processes to explain differences between liars and truth tellers, another factor may moderate this relationship—lying strategy. Second, while research has examined the role of memory reconstruction processes in terms of practical implications for deception detection (e.g., creating tools for lie detectors to use), it has not sufficiently integrated this research with the other deception theories to understand how memory processes mediate deception performance. Dual process theories of memory suggest that people rely on two different sources of declarative (conscious) memory—memory for events (episodic) and for facts and knowledge (semantic; Tulving, 1984). Liars may rely strictly on one of these sources, or on a combination of both; however, the role of memory processes on deception has not been fully explored. The current research explores the explanatory role of strategies employed by liars and the impact of memory reconstruction processes therein as factors that may inform research on deception.

1.1 Lying

Lying, as defined by Vrij (2008), is “a successful or unsuccessful deliberate attempt, without forewarning to create in another a belief which the communicator considers to be untrue” (p. 15). Lies are told about thoughts, feelings, attitudes, and actions. While deception is often considered to be a selfish and disruptive behavior (DePaulo, Kashy, Kirkendol, Wyer, & Epstein, 1996; Schweitzer, Hershey, & Bradlow, 2006), it is commonplace in society. In fact, in a study conducted by Hample (1980), three-fourths of participants claimed to have experienced a situation that required lying. Studies using self-report methods such as journaling have found that individuals tell at least one to two lies per day (DePaulo et al., 1996) and deceive in approximately 25% of social interactions (Lippard, 1988).

While there appears to be a disconnect between the fact that lying is considered a socially undesirable behavior yet it is routine practice, this can partially be explained by the wide range of motivations for deception. One dimension of motivations that research has investigated involves orientation of the lie towards one’s self versus others. Although the stereotypical view of lying is that of a selfish act (Schweitzer et al., 2006), lies can also be told to benefit other individuals (e.g., to protect a friend; Perkins and Turiel, 2007). In addition to this dimension, Vrij (2008) discusses how lies can be told in order to gain an advantage or avoid a loss, as well as for materialistic (e.g., to avoid a monetary penalty) versus psychological purposes (e.g., to avoid embarrassment).

Just as motivations for deception vary, lies also range in the severity of consequences for both the liar and the target of the lie. An individual might tell a minor lie in a social context with no intention to harm (often referred to as a “white lie”). For example, a person might tell a friend that an outfit looks attractive even when s/he believes otherwise. This type of lie is often

told to spare hurt feelings rather than to harm anyone and is often perceived as having mild, if any, consequences (Bussey, 1999). Lies can also be told in order to conceal a misdeed or transgression. These lies are typically considered more severe than white lies (Bussey, 1999). Lies of transgression told in social situations may or may not have significant consequences; however, a domain that frequently encounters lies in a more serious form is the criminal justice system. Individuals guilty of a transgression may lie in order to avoid suspicion for committing that act. Innocent suspects may also lie to avoid unwarranted suspicion or to protect another person. In the wake of the 9-11 terrorist attacks, researchers and practitioners have become particularly interested in lies told in intelligence-gathering situations given the potential impact of successful deceit on the lives of millions of people. Deceit encountered in this field ranges from lies regarding transgressions, to affiliations (e.g., whether an individual is a part of a particular organization), to knowledge (e.g., whether an individual possesses information about an event or person). They can include lies about past activities or future plans (Granhag, 2004). Deception in forensic and intelligence-gathering contexts often involves much greater consequences than those of everyday, social lies. Deception in these contexts is therefore often the focus of deception research.

1.2 Strategies of Lying

While many issues related to deception such as those discussed above have been thoroughly explored in research, less is known about *how* people create lies. Granhag and Stromwall (2004) noted that the research community has largely neglected strategies that are invoked by liars. A small body of research has begun to examine this issue, typically by simply asking participants to provide the general strategies they implemented while generating truthful or deceptive statements. Primary strategies for liars include telling as much truth as possible

(Hartwig et al., 2007), using real world components in their statements (Stromwall et al., 2007), and keeping their stories simple (Stromwall et al., 2006).

In another self-report study of lying strategies, Lippard (1988) asked college students to track all instances of deception that they used over a three-week period. He found six distinct categories of deception: exaggerating, withholding information, telling half-truths/distorting, lying (i.e., explicitly stated lying with commission), cheating, and stealing. The latter two categories will not be discussed for the purposes of this research which is focused on lying, not deception through actions only.

Exaggerating. Exaggeration is an intentional attempt to overstate the degree of truth in order to create a belief in another individual that the communicator knows to be untrue (Lippard, 1988). Examples of exaggeration may include presenting oneself as more capable than is true in a job interview or as more excited for an upcoming event than is actually the case.

Withholding information. People may also withhold portions of the truth from a statement. These lies are often referred to as lies of omission (e.g., Van Swol, Braun, & Malhotra, 2012). A teenager using this strategy may attempt to deceive his parents by being forthcoming about his plans to go to the movies with friends, but exclude his plans to go to a party afterwards.

Telling half-truths. Lippard's (1988) conceptualization of half-truths involves providing statements that contain a certain degree of truth, while altering some details to deceive. One way that this can be accomplished is by interjecting truthful information from one context into the context surrounding the lie. Malone, Adams, Anderson, Ansfield, and DePaulo (1997; as cited in DePaulo et al., 2003) found this strategy to be the most frequently cited lying strategy used in romantic relationships. Individuals based their lies on prior experiences, altering only what was

necessary. Similarly, in a study of deception in the legal context, Wang, Chen, and Atabakhsh (2004) found that criminals often alter only small portions of their identity. Bond and Speller (2010) agreed that most people lie by interspersing deceptive statements with truth—an act the researchers labeled “displacement.” These researchers highlighted three specific types of displacement people can use: temporal, spatial, and affective displacement. A teenager may temporally displace when asked by a parent what he did the previous night by recounting his exact experiences from a different night. This same individual could alternatively spatially displace by detailing his actions at one friend’s house as if they happened at a different friend’s house. Affective displacement occurs when feelings for one person or situation are transposed and applied to another person or situation. If someone who does not support Barack Obama is asked how she feels about the President and wishes to appear supportive towards him, this individual could take her positive feelings for someone she does endorse and apply them to Obama.

Most recently, Leins, Fisher, and Ross (2012) interviewed participants with the intention of investigating liars’ decision-making processes in greater detail than previous studies. They asked participants to lie about a specific two-hour window of a particular evening. Interviewees were free to adopt any strategy they felt appropriate in order to successfully deceive. Following the lie, they were asked to explain their strategy in general and were then directly questioned as to whether they used a previous experience for each major detail in their statement. In two similar studies, the authors found that a majority of liars (67% and 86%) relied upon prior experiences. Leins et al. (2012) concluded that because people use past experiences to lie, purported indicators of deception that are based on memory processes that distinguish true

experiences from imagined events may not be as useful for a majority of lies as literature had indicated.

Lying (novel lies). Finally, individuals may choose to create an entirely novel lie. This would involve fabricating details that have not actually happened in order to create a story. If someone needs to lie about going to the ballet and has never been before, with no prior experiences to use in order to displace, that person would likely need to fabricate a new story.

Critique of the literature. The literature concerning lying strategies is sparse. Additionally, most of the studies that have examined these strategies have done so only in a general sense, with surveys asking participants to freely report how they lie (e.g., Lippard, 1988; Stromwall, Hartwig, Granhag, 2006). This method only allows for a general understanding of strategic approaches to lying. This method has not allowed for a full understanding of strategies and individuals' motives behind choosing these strategies.

Although Bond and Speller (2010) did provide a more detailed taxonomy of lying strategies, the categories they conceptualized (e.g., temporal, spatial, and affective displacements) were based entirely upon speculation regarding the different ways liars *could* displace, not on experimental or observational accounts. While these assumptions appear sensible, it is imperative to have empirical support for these strategies. Another weakness of this taxonomy is that novel lies may be more plausible than the authors indicated. If an individual must lie about something that they have not experienced, they may be unable to use displacement. In the example of the individual who has never been to the ballet, s/he is unfamiliar with this context and will be unable to temporally displace, therefore requiring a new, fabricated story. Furthermore, individuals may not have a strong memory of an experience to

draw upon that fit the demands of the situation. In this case it may be easier for them to create a novel story (albeit one still based on familiar situations).

Leins et al. (2012) attempted to fill this gap in research by using an interview to examine lying strategies; however, their study did not solve the issue that plagued the self-report surveys discussed above—lack of depth. After asking participants to report their general strategy, the interviewers asked participants if they had ever previously experienced each detail that they referred to in their lie. Results indicated that 67% of participants chose a strategy involving at least one experienced event and 84% of all reported details were previously experienced. The authors concluded that people rarely use conceptual knowledge in lies and instead rely on their memories of prior experiences (i.e., displacement). However, it is plausible that this conclusion is unjustified and a result of not probing participants' responses deeply enough. Participants may have used conceptual knowledge based on previous experiences, but reported to the researchers that they used an actual prior experience. For example, if someone lied by saying that they had eaten dinner with a friend, s/he may have reported this to researchers as a prior experience despite using conceptual knowledge accumulated from several experiences of dinners with friends. Even in the most in-depth study examining lying strategies, questions about this issue remain unanswered.

Finally, no research investigating strategies of lies has attempted to integrate these strategies with other theories of deception in order to understand exactly how strategies impact both the act of deception and perceptions of the statement. The importance of integrating deception theories with strategies will be discussed further below.

1.3 Cues to Deception

One potential effect of using various strategies to lie is that these strategies will differ with regard to their impact on content of the statement and behaviors of the liar. In order to successfully distinguish between lies and truths, there must be detectable differences between them. Observable differences in behaviors or impressions are referred to as “cues” to deception or truthfulness. Researchers have thoroughly examined these cues and generally place them into three categories: verbal, nonverbal, and vocal (DePaulo et al., 2003). *Verbal* cues are cues derived from the actual content of the speaker’s statement (e.g., level of detail, admitted lack of memory, negative statements). *Nonverbal* cues are those that can be observed solely from the physical behavior of the speaker (e.g., eye contact, fidgeting, posture). *Vocal* cues involve characteristics of speech (e.g., voice pitch, response latency).

Many studies have attempted to identify differences between lies and truths by recording statements, coding them for selected cues, and comparing the two groups for the presence or absence of those cues. Unfortunately, results across such studies are inconsistent (DePaulo et al., 2003). Nevertheless, research has developed a sufficient knowledge base to determine which cues are and are not predictive of deception and truth.

Diagnostic versus non-diagnostic cues. A meta-analytic review conducted by DePaulo and colleagues (2003) investigated 158 purported cues to deception or truthfulness from 120 independent samples. The general finding from this review was that there is no one, perfect cue (or combination of cues) to deception that, through observation, can indicate with high accuracy whether an individual is lying or telling the truth. While numerous cues are diagnostic of differences between liars and truth tellers, these cues tend to have relatively small effect sizes.

Whereas a commonly held belief is that nonverbal cues are most helpful in detecting deception (Global Deception Team, 2006), DePaulo et al. (2003) determined that, in general, these are the least reliable cues. Instead, verbal cues tend to be more diagnostic of deception. In total, 20 significant cues were identified with effect sizes larger than $d = .20$. Just three of these cues were nonverbal, three were vocal, and the remaining 14 were verbal. These findings have led researchers to focus on the verbal content of deceptive and truthful statements rather than nonverbal and vocal behaviors.

An individual's knowledge of these cues (or lack thereof) has critical implications for detecting deception. If the appropriate cues are attended to, detection should improve. Numerous studies have attempted to train both lay persons and professionals on these cues in order to improve detection accuracy (e.g., Vrij & Graham, 1997; DePaulo, Lassiter, & Stone, 1982; deTurck, 1991). Unfortunately, these studies have found limited improvements in accuracy, in part due to the fact that the effect sizes associated with these cues are small (Hauch, Sporer, Michael, & Meissner, 2010).

1.4 Theories of Deception

Researchers have developed and assessed multiple theories that use various psychological processes to explain why cues differ between lies and truths. These theories are often categorized into three types: affective, behavioral control, and cognitive complexity theories (Vrij, 2008). While researchers acknowledge that no theory or process alone is likely to account for all differences, little empirical research has investigated how these processes work interdependently. Additionally, theoretical perspectives from a fourth body of research—memory reconstruction—may help to explain differences between lies and truths. While deception research has investigated issues related to memory processes, it has done so with a focus on

practical implications by using this knowledge to create tools to improve deception detection. Integrating memory-related processes with other psychological processes relevant to deception, in light of divergent lying strategies, should provide a more comprehensive understanding of deception.

Affective theory. Affective theory involves two components: emotional responses related to the subject matter of a statement and arousal caused by actually providing that statement. Ekman (1989) suggested that liars, compared to truth tellers, experience different levels of certain emotions regarding their attitudes toward the issue or event in question. For example, liars may feel guilt for a transgression they committed, whereas truth tellers should not experience guilt when providing their account. Negative emotions such as guilt can result in nonverbal behaviors related to withdrawal, and verbal behaviors such as negative statements and statements that distance the liar from the content of the lie (Vrij, 2008). Zuckerman, DePaulo, and Rosenthal (1980) suggested that, apart from emotions relevant to the lie, the act of lying itself should lead liars to experience higher levels of psychological arousal. Liars may be fearful of being caught or excited at the possibility of duping the target of the lie (Vrij, 2008). Greater physiological arousal accompanying these emotions is predicted to result in increases in certain nonverbal (e.g., blinking) and vocal behaviors (e.g., voice pitch).

Behavioral control theory. DePaulo (1992) asserted that liars and truth tellers have much in common—both are concerned with the consequences of not being believed and will only succeed if they present themselves as sincere. The distinction between these groups is that only a truthful individual's sincerity is genuine. While both could be aware that observers may evaluate their words and behaviors in order to assess their credibility (Buller & Burgoon, 1996), liars are generally more cognizant of their performance and impressions. This is because liars

are less likely to take their credibility for granted (Kassin & Norwick, 2004). Therefore, more often than truth tellers, liars will attempt to appear credible by controlling behavior (Buller & Burgoon, 1996). While some behaviors are difficult to control (e.g., voice pitch), others are easily manipulated (e.g., hand and arm movements, posture). As a result, attempted control of some nonverbal behaviors may be fruitless (Ekman, 1989), but the resulting effect from controllable cues may give statements a flat and monotonous appearance (DePaulo et al., 2003). Attempting to control verbal behaviors in order to demonstrate credibility could result in less detailed (less opportunities to be caught) and more consistent stories (Vrij, 2008).

Cognitive complexity theory. The cognitive complexity perspective rests on the finding that lying requires more cognitive resources than telling the truth. Compared to truth tellers, liars more often monitor their stories to ensure consistency (Vrij, 2008), monitor both their own and the interviewer's behaviors to appear credible (Buller & Burgoon, 1996), expend effort suppressing the truth, and do not take their own credibility for granted (Kassin & Norwick, 2004). Each of these tasks requires cognitive resources. Vrij and colleagues (e.g., Vrij, Semin, & Bull, 1996; Mann & Vrij, 2006; Vrij, Fisher, Mann, & Leal, 2006) have confirmed the notion that lying is more cognitively demanding than telling the truth. Because of the cognitive effort required to lie and the fact that humans have a limited supply of cognitive resources available at any given time (Fitoussi & Wenger, 2011), liars should have fewer resources to allocate towards creating an involved, consistent, and believable lie. This could result in differences between liars and truth tellers in speech content (e.g., level of detail) or memory failures. Additionally, research in other domains has found that people performing high versus low cognitively demanding tasks differ in nonverbal behavior (e.g., less blinking, fewer hand and arm

movements, more gaze aversion; Bagley & Manelis, 1979; Ekman, 1997). Similar results could be predicted for liars (high cognitive demand) and truth tellers (low cognitive demand).

Memory reconstruction processes. Although not traditionally discussed in this context, dual process theories of memory that distinguish between episodic memory (memory for personal experiences) and semantic memory (memory for facts, ideas, and concepts; Tulving, 1984) may have implications on differences between lies and truths. Whereas truths regarding autobiographical events should rely extensively on episodic memory, lies of this nature may or may not depend more on semantic memory. This issue will be discussed in greater detail below.

Information in semantic memory is often organized through schemas (mental frameworks for organized knowledge; Bartlett, 1932). Of particular interest is the schematic representation of a *script*—a structure that describes appropriate sequences of events in a particular context (Hudson, 1992). An individual may have a script for a night at the bar and could use this information to describe a typical evening in this context. The script may include props (e.g., tables and chairs, drinks, menus, etc.), players (e.g., employees and customers), scenes (e.g., ordering, drinking, conversations), and results (e.g., have fun, meet new people). Greater experience in a particular situation leads to more elaborately developed schemas and scripts, and quicker organization of statements (Pryor & Merluzzi, 1985).

One specific dual process theory of memory is fuzzy-trace theory (FTT), which models the relationship between memory and higher-level reasoning (Brainerd & Reyna, 2002). This theory distinguishes between two distinct forms of memory that are processed in parallel to each other and are retrieved via dissociated pathways—gist and verbatim. Gist (a non-recollective form of memory) involves understanding an event’s meanings, patterns, and relations, whereas verbatim (a recollective form of memory) refers to vivid recall of the surface traits and

contextual cues of an experience. While gist and verbatim are dissociated in both encoding and retrieval stages, Brainerd and Reyna (1988) asserted that both can be held in working memory at one time. Further, gist traces can vary in their level of abstraction from verbatim information (Reyna & Brainerd, 1991). Brainerd and Reyna (1990) therefore proposed a fuzzy-to-verbatim continuum that ranges from the most basic essence of encoded information to verbatim which has preserved the exact perceptual details of this information. While humans may have access to information at any point on this continuum, we prefer to rely on as much gist as possible for tasks in large part because of the lower levels of processing complexity associated with these traces (Brainerd and Reyna, 1990). For the purposes of the current research, certain lying strategies will be referred to as relying upon either gist or verbatim, but it is important to note that these strategies would be found on a continuum, either toward the verbatim or basic gist ends.

FTT has been used in the study of false memories, finding that false memories often appear from details that are consistent with the gist of an experience (Brainerd & Reyna, 2002). For example, an individual might recall seeing the word “sleep” in a list of words that are semantically related to sleep. False memories are more likely to occur when the gist of an event is highly incorporated (Roediger & McDermott, 2000).

In related work, Johnson and Raye (1981) found that memories of past experiences differ in quality from those of imagined events due to the fact that memories from experiences are formed through perceptual processes (e.g., sensory and contextual information), whereas those from imagined events are produced by cognitions (e.g., thoughts and reasoning). These researchers found that memories based on actual experiences contain more sensory characteristics, cognitive operations, and contextual attributions (time and place) than imagined

events. This distinction relates to the dual process theory of memory as memories from past experiences will likely rely heavily on episodic memories, while those of imagined events will draw more from semantic memory. Johnson and Raye (1981) labeled the process by which individuals attribute a memory to an experienced or imagined event Reality Monitoring (RM).

While initially used to help determine whether a memory was true or false, in recent years researchers (e.g., Sporer, 1997; Sporer, 2004) have applied RM to the deception detection domain, making the association that truths are memories of experienced events and lies are comparable to imagined events. Sporer (1997) created a set of eight criteria on which to rate deceptive and truthful statements: clarity, spatial information, temporal information, perceptual information, reported affect for the event, realism, reconstructability of the story, and reported cognitive operations at the time of the event. Truthful stories were expected to contain greater levels of each of these criteria. Several studies have examined the effectiveness of using RM as a tool for individuals to use in order to aid deception detection (e.g., Granhag, Stromwall, & Landstrom, 2006; Sporer, 1997, Stromwall & Granhag, 2005). These studies found an average truth accuracy rate of 72% and average lie accuracy rate of 66% (Vrij, 2008)—both well above the 54% global accuracy rate found by Bond and DePaulo (2006).

Limitations of current theoretical approaches. Although the processes described above make logical predictions about behavioral differences between liars and truth tellers, research has identified a few noteworthy concerns. One problematic limitation is that the theories sometimes offer opposing predictions (Vrij, 2008). For example, affective theories suggest a greater number of body movements when lying, whereas behavioral control and cognitive complexity theories predict that liars' body movements should decrease. Another limitation specific to the affective perspective is that the emotions predicted to occur as a result of deception can occur in

the absence of deception. For example, a truthful individual may reasonably be just as fearful about being judged as deceptive as a liar. A truthful individual experiencing guilt, fear, and/or excitement could appear deceptive if the detector is relying on cues purported by the affective theory.

Integrating psychological processes with strategies. As documented above, although theories of deception have made reasonable predictions regarding expected differences between lies and truths, studies examining cues to deception have found inconsistent and discouraging results. A more sophisticated theoretical understanding of the relationship between lying strategy and cues to deception may help explain these findings. Various lying strategies may be differentially associated with the deception-related processes. These relationships could then impact cues evinced by a liar.

For example, a few studies have found that lower levels of guilt accompany lies of omission (withholding of information) versus those of commission (DePaulo et al., 2003). The deceiver rationalizes a lie of omission with the fact that s/he did not explicitly lie to the target(s). This difference in feelings of guilt between these lying strategies could in turn affect the cues that are elicited, with individuals using lies of omission displaying fewer cues indicative of guilt than those relying on lies of commission. Jung and Lee (2012) examined the impact of lie types (e.g., memorized lies vs. self-created lies) on a physiological measure (i.e., alpha desynchronization) of cognitive activity. They found that this measure could differentiate between these types of lies, as well as the truth. These findings support the notion that differences in lying strategies can result in varying reactions by the liar via cognitive and emotional processes.

For the purposes of the present research, differences between temporal displacements and novel lies will be examined in relation to these processes. Just as lies of omission may reduce levels of guilt, individuals telling displacements (compared to novel lies) may experience less fear and excitement. Given that they are relying upon prior experiences, they may feel more confident that their lies will be judged as credible, thus resulting in lower arousal levels. Similarly, they may also feel less excited about potentially duping the interviewer if they believe that it is less of a challenge to convince someone of a lie that is mostly true.

Lies require more cognitive effort than truths in part because liars must expend effort to formulate their statements and keep the details consistent. This increased effort is not required of truth tellers since they retrieve stories from memory and therefore generally have fewer problems maintaining consistency. A similar pattern of differences in cognitive effort may exist between novel lies and displacements. An individual who provides a displaced lie suggesting that s/he did something that actually happened, just at a different time (*who*, *where*, and *what* are the same, but the *when* is different), should expend less cognitive effort than someone who creates a story in which details are fabricated and pieced together in a logical order.

Bond and Speller (2010) asserted that liars rely predominantly upon episodic memory because displacements, which the researchers claim are used in a majority of lies, concern an event that the liar actually experienced. One implication of this is that cues such as those used in Reality Monitoring, which depend on lies being constructed from imagined experiences, may not be as helpful as previously believed. However, novel lies may not be as difficult and uncommon as Bond and Speller (2010) claimed. Someone with a particularly elaborate script may have little trouble recounting a novel, deceptive story involving that script. As such, the notion that novel

lies are much more difficult to create and tell, and therefore are rarely used may not be completely justified.

While there is reason to expect that lying strategies could moderate the relationship between psychological processes and perceptions of lies, further research is needed to understand how these processes might be associated with different lying strategies and to assess how lying strategies in turn impact the display of cues to deception and perceptions of veracity. Knowledge of strategies that liars use and the best cues to focus on for each of these strategies would be useful information for practitioners. Further, it may be possible to leverage this knowledge into more effective investigative interviewing techniques.

1.5 Current Studies

The purpose of the current research was to gain greater insight into various lying strategies, how these strategies relate to the psychological processes described above, and their impact on cues to deception and deception detection. The few studies that have examined lying strategies have failed to fully integrate them with existing theories of deception, or to thoroughly understand their impact on subsequent perceptions of the lie. This goal was accomplished through three related studies.

In order to obtain a more comprehensive understanding of the strategies that people use to lie, the decision process behind those strategies, and the role psychological processes play, participants in Study 1 were recruited to undergo a Protocol Analysis and Cognitive Task Analysis (explained below). Participants planned a deceptive statement about an autobiographical event without restrictions on how to accomplish this. Half were then systematically interviewed regarding their thought processes during the planning phase, including the strategies they planned to enact in order to appear truthful. Other participants

provided their statement and were then interviewed with a nearly identical set of questions about this process. Of particular interest was the degree to which liars displaced and/or fabricated novel stories. Other variables such as reliance upon semantic (gist) and episodic memory (verbatim), affect, attempted behavioral control, and cognitive complexity, were probed as well. In Study 2, a new group of participants told a truth and a lie using either displacement or novel lying strategies. Recordings of these statements were then coded for diagnostic cues to deception and truthfulness in order to examine potential differences between types of lies. Finally, Study 3 explored similarities and differences in individuals' abilities to detect these types of lies with a third group of participants judging the veracities of these statements.

Chapter 2: Lying Strategies and Their Impact on Psychological Processes (Study 1)

2.1 Introduction to Study 1

As previously noted, there is a shortage of research examining the strategies people use when lying. While a few studies have assessed certain strategies in a very general sense (Stromwall, Hartwig, Granhag, 2006; Stromwall, Granhag, & Langstrom, 2007; Hartwig, Granhag, & Stromwall, 2007; Lippard, 1988), it would be beneficial to fully explore the act of lying. The one known study (Leins et al., 2012) that examined strategy choice in an interview context failed to do so with sufficient depth. A major weakness of this study was that researchers concluded that participants used prior experiences (displacement) when lying and not semantic memory, even though their interview questions likely did not successfully enable them to observe this distinction. This interview was limited to one open-ended question regarding the strategies participants used and a follow up question for each major detail as to whether they had experienced it before. Therefore, a study was needed to probe this process in the detail and determine the extent to which individuals rely on verbatim versus gist traces of experiences. In addition to better understanding these strategies, it is also important to know how these strategies might influence psychological processes related to cues to deception (i.e., affective, cognitive complexity, behavioral control, and memory reconstruction), and to determine how these processes work concurrently, as well as differentially as a function of lie strategy. No known studies have investigated these relationships together.

Probing strategic decision making. Researchers have created systematic interviewing methods to closely examine decision-making processes. The two methods that were used for the present study included Protocol Analysis (PA; Ericsson & Simon, 1993) and Cognitive Task Analysis (CTA; Crandall, Klein, and Hoffman, 2006). Both have been previously used across a

multitude of disciplines (e.g., marketing research, system analysts, program managers, military decision making; Crandall et al., 2006) and are often used in applied psychology to probe the cognitions of experts in a particular domain. Experts are typically first confronted with a situation that requires a decision to be made and are then observed and/or interviewed about their decision process. There are benefits and costs associated with these methods and techniques within each method. Decisions regarding the use of a particular method and technique are typically made based on the specific interests of the research questions (Crandall et al., 2006).

The primary distinction between these two techniques is that PA uses undirected probe questions that allow the interviewees to freely report their cognitive processes through real-time and/or retrospective verbal reports. CTA, on the other hand, uses a structured interview where specific prompts are directed toward key research questions. A limitation of directed interviews is that considering a specific question may bias participants' interpretations of their thought processes (Ericsson & Simon, 1993). However, structured interviews can also provide a rich source of data in comparison to PA.

A retrospective protocol is a specific technique that requires participants to think back over a past experience and reflect on their thought processes. One common criticism of this approach is that it assumes participants are both honest and aware of their cognitive operations, which research has shown is not always the case (Crandall et al., 2006; Nisbett & Wilson, 1977). Additionally, if an individual is unaware that their cognitions will be probed, they may not successfully encode this information. However, research has indicated that if cognitions are recalled shortly after the related experience, information can have good reliability (Crandall et al., 2006). In order to take advantage of the strengths of PA and CTA, both were used in the study.

2.2 Study 1 Methods

Participants. Thirty-six undergraduate students from the University of Texas at El Paso (UTEP) were recruited to participate in this study from Introduction to Psychology courses. Individuals participated in exchange for course credit. Four participants were excluded from analyses. Three of these exclusions were due to low language proficiency resulting in difficulties in understanding the task instructions and in communication throughout the interview. The fourth exclusion involved a participant who was uncooperative, providing minimal responses throughout the tasks. Therefore, the final analyses consisted of 32 interviewees (56.3% female and 78.1% Hispanic) with a mean age of 19.88.

Design. Interview timing was manipulated between-subjects as half of the participants were interviewed immediately after the planning phase and half after providing the statement. This manipulation was included due to findings in the PA and CTA literature that information becomes less reliable over time. It may be difficult for participants to provide full and accurate information regarding their thought processes during the planning phase when time has passed and they have engaged in an activity that may have caused interference (i.e., providing the statement). This distinction is particularly important given potential differences in the roles of various processes at the planning versus providing stages. For example, individuals who recently planned a statement may be more aware of processes related to memory reconstruction as this phase requires them to think through their narrative. However, individuals who provided the statement may be more cognizant of affective, behavioral control, and cognitive complexity issues that may be more salient and impactful during this stage.

Materials. A set of interview questions was produced using Ericsson and Simon (1993) and Crandall et al.'s (2006) recommended questions (see Appendix A). The questions were

altered to fit the context of an interview regarding lying strategies, as well as to enable the investigation of specific variables of interest (e.g., memory reconstruction, cognitive complexity). Other than slight changes in the wording appropriate for participants in the plan versus provide conditions, scripts for these conditions were kept consistent with one another in order to collect comparable data.

Procedure. Upon arrival to the experiment, participants were greeted by a researcher and provided informed consent. They were then randomly assigned to be interviewed following the planning or providing stage and were given with instructions on how they should lie (see Appendix B). Participants were instructed to create a deceptive account of their whereabouts for the previous Friday evening from 6:00 pm to 11:00 pm that would convince an interviewer that they were telling the truth. These instructions were created so that participants would be unrestricted in their strategy choice. In addition, participants were given \$5 and told that they would be interviewed by an individual who had been trained to detect deception (i.e., a confederate) and would not know whether their statement was truthful or deceptive. Participants were told that if they were able to convince the interviewer that they were truthful, they would keep the money. In reality, all participants were allowed to keep the money. The purpose of this cover story was to create a more realistic scenario by increasing incentive and motivation for the task. Studies with lower stakes and less experimental realism may risk not invoking affective, behavioral control, and cognitive processes. Given that the intentions of the study were to observe these processes, it was important to take considerable efforts to increase experimental realism.

Following the instructions, participants were given five minutes to prepare their statement, after which half of the participants were told that the true purpose of the study was to

obtain a better understanding of their thoughts and feelings while planning the lie. This information was not given to them beforehand to ensure that their thought processes were not influenced by this knowledge. The other half of participants were interviewed by the confederate beginning with the following statement: “Tell me everything that you can remember about your whereabouts on Friday night between the hours of 6:00 and 11:00 pm.” All interviews were video recorded. After the interview, participants in this condition were also told the true purpose of the study.

Led by the researcher, the PA/CTA interview protocol began with unguided PA questions. Individuals in the planning condition were asked to report everything that they remembered thinking during this phase and those who provided their statement were interviewed primarily about their experiences while actually providing the statement, but were allowed to discuss experiences from the planning session as well.

Following the undirected PA section, individuals who provided the autobiographical statement were shown the videotape of their statement. Participants were told that watching this recording may trigger their memory for issues that they were thinking about and they should give a ‘play by play’ summary of their thoughts and feelings while providing the statement. The recording was paused each time participants spoke. If they did not spontaneously report their thoughts regularly throughout the video, the researcher prompted them to provide introspection at major shifts in the story.

Finally, all participants were interviewed using the scripted CTA questions. See Appendix A for PA/CTA interview questions. Throughout these questions, participants were also asked to respond to a series of Likert scale questions (on a 7-point scale) regarding their perceptions of their emotions, task difficulty, impression management, use of gist versus

verbatim, and comfort level with how they lied (see Appendix C). Each scaled question was given to participants after their response to a corresponding question in the CTA interview. The entire interview was audio-recorded. Interviews lasted between 15 and 32 minutes.

Coding. Based upon the research questions and trends observed in the interviews, a coding scheme was developed to encompass a majority of the information that participants provided. For example, when discussing their strategies, participants often mentioned attempting to create either a complex or simple statement. Others mentioned using an event that was familiar to them. See Appendix D for full coding scheme. Rather than creating categories of responses for each question, themes were distilled from responses across the interview. For instance, using a situation familiar to the participant could have been part of responses to a number of questions and discussed in a variety of ways. The coding scheme merged all of these responses together into one common theme. Coders also tracked whether responses were discussed in the open-ended Protocol Analysis or closed-ended Cognitive Task Analysis sections.

Interviews were coded by two independent coders. Once the coding scheme was initially developed, they coded one interview together and discussed responses for each theme. The coding scheme was then altered based on issues that arose from this discussion. Next, three interviews were coded independently. Coders then compared responses for these interviews and further refined the scheme based on disagreement or thoughts regarding potential future issues. Finally, the coders independently coded the remaining videos and re-coded the first four interviews using the finalized coding scheme.

2.3 Study 1 Hypotheses

The primary research questions of interest involved the strategies that liars use and the relationships between these strategies and various psychological processes. While, due to low power, hypothesis testing was not used to analyze differences across conditions, several trends in responses were expected.

Hypothesis 1. All participants were expected to report using (or planning to use) strategies similar to those reported in previous studies—telling as much truth as possible, using real world experiences, and keeping the story simple (e.g., Hartwig et al., 2007; Stromwall et al., 2006; Stromwall et al., 2007).

Hypothesis 2. In response to CTA questions attempting to differentiate verbatim (episodic memory) and gist (semantic memory), liars were expected to acknowledge relying more heavily on gist than verbatim compared to the levels that some researchers have recently suggested (e.g., Bond & Speller, 2010; Leins et al., 2012).

Hypothesis 3. Consistent with theories of deception, participants were expected to report experiencing cognitive demand, affect (e.g., fear, guilt, and excitement), and efforts to control their behavior in order to appear credible. However, given that truthful participants were not interviewed, levels of these processes cannot be compared to a truthful baseline.

Hypothesis 4. Assuming that both novel lie and displacement strategies were reported, participants who created novel lies were expected to report higher levels of cognitive demand than those relying on displacement.

2.4 Study 1 Data Analysis

Percentages of participant responses in each category identified in the coding scheme were calculated to examine trends in responding. It is important to note that reported

percentages in certain categories do not necessarily imply that no other interviewees considered that issue. It is possible (and likely in some situations) that more individuals considered some issues than was actually reported in the interview. Furthermore, in certain themes, participants could have responses placed in two seemingly opposing categories. For example, participants might mention both trying to use a typical, everyday situation, but also report that they wanted to make their story unique. Categories were not mutually exclusive. Therefore, some of the percentages of responses for certain categories add up to greater than 100%.

2.5 Study 1 Results

Reliability. Reliability was calculated for all major coding themes using Cohen's Kappa. Using Fleiss' (1981) guidelines for reliability, a majority of the themes achieved either fair-to-good (.40-.79) or excellent reliability (.80-1.00). Poor agreement was found for "Chose strategy because of believability by interviewer" (.218) and "Made it personal" (.310). Disagreements on the former were caused by different interpretations of themes that were not resolved in the four interviews coded together, but were easily resolved once coders agreed on definitions. "Made it personal" and "Sound nice/innocent" (which achieved good reliability) themes both referred to building rapport with the interviewer. When these similar categories were combined, good reliability was attained. Disagreements for each theme were discussed until a mutual decision was agreed upon by both raters. See Table 1 for reliability for all major categories in the coding scheme

Responses. The primary variable of interest in this study was the strategies that individuals used in order to lie. Specific questions investigated the extent to which participants used (or planned to use) actual experiences (i.e., verbatim) versus memories distilled from multiple previous experiences (i.e., gist). Use of actual experiences was considered a

displacement and the use of conceptual knowledge a novel lie. In addition to reported memory strategies, the coding scheme revealed themes regarding participant motivation, cognitive complexity, impression management, and emotions. The sample quotations provided below were chosen as prototypical responses for each theme.

As indicated above, CTA questions risk biasing responses. For example, an individual in the planning session who had not previously considered controlling nonverbal behavior may have indicated otherwise upon direct questioning, either due to the feeling that s/he should have considered this strategy or that s/he actually would have if given the opportunity to provide a statement. This concern is one reason that PA questions were used in the interview.

Additionally, before the interview, it was emphasized to participants that they should only report what they actually thought and felt at the time, not what they believed the interviewer wanted to hear. They were told that their credit was in no way impacted by their responses. Additionally, following appropriate questions, participants in the planning condition were asked whether they actually considered the issue at the time or simply believed that they would have if they had provided the statement.

See Tables 2 through 8 for percentages of participants whose responses fit major themes. These themes and associated percentages are discussed in further detail below.

Memory and narrative construction strategies. One focus of participants in responses to both PA and CTA questioning involved how they created their story. See Table 2 for percentages of responses related to each issue of memory and narrative construction that is discussed below.

Simplicity versus complexity. Participants chose to use a variety of sometimes conflicting strategies in creating the content of their statement. A majority (65.6%) believed it was best to

create a complex, more detailed story, sometimes even creating evidence such as witnesses to support it (31.3%). They wanted “*a lie with a lot of substance*” (Interviewee 25). As one individual put it, “*I started to make it more like complex so it would be more believable. So I just kept adding and adding and adding*” (Interviewee 7). The most frequently reported reason for this strategy was to keep the story busy so that there was no room for other (deviant) activities (25%).

Conversely, consistent with Stromwall et al. (2006), a significant proportion of the participants also reported attempts to keep the story simple (34.4%). The primary reason for this approach was that too much detail would seem made up (21.8%). For example, one individual said that “*If I do it too complex it’s going to be like if I’m lying or, you know, I think that whenever someone says a lot of things and adds a lot of details it’s because they’re nervous and want to make a point*” (Interviewee 27). Another (Interviewee 34) reported that he “*tried not to give the exact time*” for this same reason. A few interviewees took a middle ground, one commenting that he wanted to make it “*complex for the interviewer, but simple for me*” to remember (Interviewee 21) and another stating, “*I wanted to be as detailed as possible, but not overly detailed because nobody remembers exactly when and where and how something happened. So I was going to give general statements like ‘I got to dinner around 6:20ish.’*” (Interviewee 11).

Typical versus unique. In another example of contrasting strategies, while a sizable majority (84.4%) of individuals reported using (or planning to use) a familiar situation by incorporating either typical events (68.8%) or the truth (75%) into their statements (consistent with previous research; Hartwig et al., 2007; Stromwall et al., 2007), several interviewees (18.8%) felt it important to create a unique story.

Responses such as “*everyone knows I do that sort of thing*” (Interviewee 23) and “*something that more than likely would have happened on the weekend anyway*” (Interviewee 32) referred to participants’ use of typical events. Interviewee 26, another individual who chose to create a seemingly commonplace situation, said, “*...the reason I picked it was because it was pretty ideal. If I did pick a true scenario where I did something crazy, I would leave that out.*” Another stated, “*You’re going to be like ‘oh’ well that makes sense. People do that. You know everybody does that...That seems like a typical Friday night, what people would do. Nothing out of the ordinary*” (Interviewee 15). While participants frequently referred to everyday situations with which they had personal experience, it was sometimes the case that they chose a story (or detail) because it was something that the average person would do even if it was not an activity that they engaged in themselves. For example, in referring to the part of her story where she described ‘checking guys out’ in Barnes & Noble, Interviewee 15 explained, “*I don’t really check guys out, but that’s something that an average girl might do.*”

Others took the use of a familiar situation a step further, claiming that they inserted truth into their statements. They reported that they “*formulated the story from past memories*” and tried to be “*as truthful as possible, but still lie*” (Interviewee 23). Interviewees reported using this strategy because they “*didn’t want to come up with an actual lie*” (Interviewee 25), “*it’s more natural and believable because (they’ve) done it before*”, “*you’re not lying, you’re being truthful*” (Interviewee 2), and “*it’s the truth so why wouldn’t they believe it?*” (Interviewee 35).

However, some participants did choose to create stories that deviated from ordinary events. For instance, Interviewee 8 used a story that “*was kind of like an extravagant thing we are going to do tonight*”. Then in discussing why she chose something extravagant rather than an everyday situation, she explained, “*I thought that would be too normal.*” Another said, “*I was*

going to say something normal like some normal person would do on an average Friday night, but I was like that was too obvious...It's not as believable because everybody does that"

(Interviewee 25).

Gist versus verbatim. A majority of participants reported incorporating both familiar things and truth into their stories. Further probing of their memories for the stories, revealed that, as predicted, interviewees relied upon varying levels of gist and verbatim. A slight majority (59.4%) reported using (or planning to use) primarily gist, with one-third of this group of interviewees (21.9% total) relying (or planning to rely) on verbatim for small details or in response to specific follow up questions. One interviewee in the latter group said *"It's definitely a general storyline...You wanna leave room for, you know, like variability. You can add things in there if you want to. I feel like if you give an exact experience that doesn't leave room for anything like that. So yeah, a general storyline is more appropriate for that I think."* However, in talking about potential follow up questions, he went on to say: *"I definitely would have used some small details that I had experienced, but I don't think that you could use a whole story that was experienced"* (Interviewee 13). Another, after providing a story using gist said that *"if they were to ask what I ordered at Olive Garden, that would be pretty easy. Just remember what I ate last time"* (Interviewee 21).

Although a majority of participants did rely primarily on gist, 18.8% reported using (or planning to use) only verbatim and 21.9% used (or planned to use) gist for one or more major parts to the story while relying on verbatim for other major part(s). An interviewee using verbatim said, *"That all happened once. That has happened to me before"* (Interviewee 11). Some made a conscious effort not to change a single detail because *"that would mess (them) up"* (Interviewee 26). Someone using a combination said her story mostly used a *"general*

storyline”, but also said that one significant portion of her story was verbatim: “*When I went to Craze, I remember what my friend got. I remember what I paid*” (Interviewee 23).

Structure and sequence. Another major focus for many (62.5%) in creating these stories was getting the timing and sequence of the story straight. Half (50.0%) of participants reported wanting to fill-up the time frame as much as possible and 40.6% reported specific consideration of story sequence and logical structure. Interviewee 15 stated that “*Location and time were my big things. Because I actually am familiar with the area, I know how much time it takes. So if you do want to check up on that, ok, go ahead. You can do that.*” Another interviewee (23) had plans to “*be more specific with hours if they don’t believe me.*”

Once their story was devised, many interviewees (31.3%) reported wanting to stick closely to this plan as a major focus of the task. However, several (21.8%) participants who provided statements reported that they failed to tell the story as planned. In describing this, one individual said her “*thought process was, okay, I know what I want to say, but then when you actually say it, I forgot this and this*” (Interviewee 18).

Rationale behind strategies. In regards to the rationale behind their choices in strategies, 56.3% reported making decisions based specifically on perceived believability on the part of the interviewer as opposed to how participants normally lie or the first thing to come to their mind (43.8%). An example from this latter rationale came from Interviewee 2 who said “*I just kinda like grasped the fastest thing that I could make up and just used that. Like, I never second guessed myself or said like what if I used this story or a different story. No, I just whatever popped in my head first I just used that.*” Those in the latter group may have been forced into this choice by the task’s time constraints.

Impression management. General impressions. Participants attempted to use a variety of general and specific strategies in order to manage the impressions they left with the interviewer. These responses can be viewed in Table 3. Many (40.6%) mentioned trying (or planning to try) to appear natural, casual, and/or to treat the interviewer like a friend. Interviewee 15 stated, “*I wanted to make a tie to a friendship. And when you’re my friend, you’re more likely to believe me,*” and Interviewee 10 explained, “*You don’t just tell strangers your whole lie. So if you put yourself in the mentality like he’s just your friend, then things just come out more easily.*” Somewhat contrarily, 25% mentioned attempting (or planning to attempt) to hold a serious demeanor. Interviewee 34 said that his goal was to “*try to be serious. Like not laugh and just take everything seriously*” and later stated that he tried to make sure that he maintained this appearance with his facial expressions. A slight majority (53.1%) discussed their (planned) attempts to remain calm throughout the process. For instance, “*I was thinking about how a relaxed person would look*” (Interviewee 31), and “*I tried to keep, um, I guess my composure ‘cause if you’re gonna tell a lie then you need to be at ease. People who are lying tend not to be*” (Interviewee 11). Finally, 31.3% of individuals discussed (planned) efforts to build rapport or trust with interviewers by exhibiting innocence and kindness in order to appear truthful. Some sought to accomplish this through the details of the story: “*I thought of an innocent thing – babysitting my brothers. More childish, more good, like of a good person*” (Interviewee 31). Other times it was done through the interaction between interviewer and interviewee. One person wondered, “*if I’m friendly will they believe me more?*” and said “*I would try to be more friendly and giggle and in my speech be more cutesy*” (Interviewee 22). Another said, “*I tried to sound nice like a good girl so I wouldn’t seem guilty. So I smiled there and was like [twirls hair]*” (Interviewee 30).

Behavioral control. Table 4 below provides percentages of participant responses related to behavioral control. Consistent with research on individuals' preconceptions of behavioral cues, participants reported attempting (or planning to attempt) to control nonverbal cues (e.g., hand/arm movements, facial expressions, eye contact; 87.5%) to a greater extent than verbal/vocal cues (e.g., contradictions, tone, fluency; 71.9%). A related finding to this focus on nonverbal cues was that 34.4% of interviewees reported having accurate knowledge of which cues (all nonverbal) they needed to control from television shows (e.g., *Lie to Me*) or other forms of media. An interesting example of the focus on and misconceptions related to nonverbal cues came from Interviewee 27 who said, "*Well the verbal, I thought that I was going to be pretty good, but it, but the nonverbal since you told me that the person had some classes on detecting lies or something, I didn't know if he was going to catch my eyes or something, my arms, my fingers, my feet were moving a lot. I was quite a bit worried about my nonverbal behavior.*" While serious attempts were made by most interviewees to control these behaviors, 68.8% of participants who provided statements still reported noticing that they were displaying a cue (e.g., eye contact, contradicted self, fidgeting) that they believed was indicative of deception.

Monitoring of interviewer. In addition to monitoring their own behavior, 65.6% of individuals made (or planned) efforts to consider the interviewer's behavior, such as questions they might ask (37.5%) or facial expressions (34.4%). However, in order to prevent differential treatment of interviewees which could potentially influence statements, the confederates were instructed to be virtually nonreactive to participants. Out of the six participants in the 'provide' condition who said that they attempted to 'read' the interviewer, three reported giving up because they were unsuccessful in gathering information from the interviewer's reactions.

Affect. Due to difficulties in assessing the degree of affect experienced by interviewees using qualitative data, frequencies below are taken from participants who reported experiencing any level of the emotions in question. Percentages of participants reported experiencing these emotions can be seen in Table 5. Additionally, scaled questions examined in a later section help quantify these emotions. Consistent with research on this theory, a large number of participants reported experiencing nervousness and excitement; however, fewer interviewees reported any level of guilt. Out of the 84.4% of interviewees reporting nervousness, 68.8% stated that this feeling was due to the situation (e.g., uncertainty, being in a smaller room and interviewed by someone whom they did not know), whereas just 28.1% felt nervous about potentially not being believed. While 25% reported feeling guilty, another 21.9% also reported that they would have felt guilty if the situation was real. Interestingly, two interviewees who relied on verbatim reported not feeling guilty because they had experienced their the events from their story before. One stated that she didn't experience guilt "*as much since I had experienced those events. It was just on a different day*" (Interviewee 3). Another said that she "*felt little to none because it happened...I felt guilty towards the end because I didn't plan what I was saying. I was coming up with things off the top of my head and from there on nothing I was saying was truthful*" (Interviewee 15). This participant inferred that she only started to feel guilty towards the end of her statement because she began to provide details that had not happened before. Finally, a large majority (81.3%) reported at least some level of excitement for the interviewer to believe them (43.8%), for them to be a good liar (21.9%), and/or for extrinsic motivations (money; 15.6%).

Cognitive complexity. As with emotions, it was also difficult to measure level of task difficulty using qualitative responses. Participants often (56.3%) reported at least a minimal level of difficulty at some point during the task due to having to create details (37.5%), keep

details straight (53.1%), get the timing straight (18.8%), or consider/answer follow-up questions (18.8%). These responses can be seen in Table 6.

Reported relationships between theories. Strategies such as using the truth (associated with verbatim) were perceived to be easier (62.5%), and similarly, more comfortable for participants to use (40.6%) than alternatives. One individual commenting on the issue of cognitive effort said that she chose the strategy because “*using these two events that were true would help make things easier...if you had asked me, um, who I was with or anything like that I could provide truthful statements, so it was just easier*” (Interviewee 16) and another that “*If I tell you the truth it’s going to be easier for me to remember everything*” (Interviewee 27). In discussing comfort, another interviewee (Interviewee 22) felt that using truthful events “*was about making (herself) feel comfortable in her lie*” and that she “*would get anxious if (she) had to completely make it up.*” Another said that she “*included the part that was semi-true so that way I feel more comfortable telling someone the truth rather than lying the entire time*” (Interviewee 18).

Motivation. A final theme that interviewees often referred to was related to their motivations in performing this task. Percentages of responses related to this theme can be found in Table 7. Overall, 84.4% appeared to generally care about successfully completing the task. Extrinsic motivation in the form of money was mentioned by 34.4% of the participants, although 15.6% mentioned it in terms of cause for added excitement in completing the task. For example, one individual stated “*Well yeah, that would have been pretty cool because I would get five dollars and that means it would have been a good lie...I felt it (excitement) at the time. I was like ‘okay, this is a really solid lie.’*” (Interviewee 25). Only one person stated that they would not have cared as much if not for the monetary incentive. Conversely, intrinsic motivation, from

the desire to either test or prove their abilities to lie successfully, was explicitly mentioned by 37.5% of participants. Interviewee 27 was one such individual as he said “*I always tell my friends that I’m a good liar...So, like, alright if I can prove myself to be a good liar I can tell them that.*” Finally, 15.6% of individuals felt the desire to get the task over with as quickly as possible. However, in every case, this desire was associated with nervousness or anxiety rather than a complete lack of motivation. For example, “*I had a more detailed story in my mind but when I was telling it I just wanted to get it over with as soon as I could because I got really uncomfortable*” (Interviewee 2).

Attitudes toward lying. While CTA questions did not directly explore interviewees’ feelings on lying in general or their beliefs regarding their performance in this specific task, many provided responses related to these issues. These findings are displayed in Table 8. In reporting their feelings about lying, 15.6% of participants said that they did not like lying and 31.3% reported being poor liars. Those who did not like to lie made comments such as, “*I get uncomfortable when I lie,*” (Interviewee 2) and “*I know people know when I’m lying; I don’t really like to lie*” (Interviewee 18). Others (15.6%), though, were confident in their lying abilities: “*I have some experience acting and I’ve been able to tell lies before when I need to, so I figured even if my story wasn’t well planned out, I still would be able to tell good lie given the questions asked and stuff. So yeah, I have high confidence in my ability to tell a good lie*” (Interviewee 13). Of individuals who actually provided statements, 25% believed that they had been successful after the interview and 25% believed that they had failed and would be judged deceptive.

Responses to protocol analysis questions only. As discussed above, one advantage of PA over CTA is that the latter risks influencing participants’ responses simply by referencing a

particular issue in a question. Therefore, while PA questions may have produced less overall information than what was acquired from the CTA section, this information is more reliable. However, it is also likely that participants waited until CTA questions to report some thoughts, feelings, or motivations because they did not realize that it was important enough to mention in the free recall.

In general, there were few differences in trends for responses to PA questions only versus the entire interview. For example, similar to responses across both PA and CTA sections of the interview, 62.5% of interviewees mentioned incorporating an everyday situation into their lies, with 28.1% reporting the use of typical and familiar events and 40.6% reporting use of the truth. The dilemma between complexity and simplicity was still apparent when looking at just PA questions as 12.5% of individuals referred to each dimension. Issues related to timing were also reported to be important for a sizable number of individuals (37.5%).

As far as managing impressions, interviewees still mentioned the desires to appear credible and honest (43.8%) and calm (15.6%). One slight change in these trends was that 34.4% mentioned planning to control at least one nonverbal cue compared to 12.5% who planned to control a verbal or vocal cue. This is a greater difference between the two than was the case across the entire interview (87.5% vs. 71.9%).

When examining emotions, nervousness was reported in 68.8% of PA questions (vs. 84.4% total), while only two people mentioned guilt and none mentioned excitement in this portion of the interview. Finally, in examining cognitive complexity theory, 15.6% of participants freely recalled difficulty with at least one part of the task.

Key differences between plan and provide conditions. The results above discussed trends in responses across plan and provide conditions. However, there were a few interesting

differences in responses between each of these conditions. In general, it appears that their strategy shifted when providing the statements (compared to planning) in order to make the task easier. Providers reported using simpler statements and relying to a greater extent on familiar events and the truth (i.e., verbatim). Due to small sample sizes, findings were reported when differences in responses between groups was three or more interviews. These differences in percentages can also be found in Table 9

Those who planned, but did not actually provide statements more often reported attempting to create a complex statement (81.3%) than did those who provided statements (50.0%). Providers, on the other hand, were more likely to report using everyday situations (96.2%) than planners (75%). Planners used more gist than providers (75% vs. 50.0%), while providers more often used a mix of both gist and verbatim (43.8% vs. 6.3%). Sticking to the planned story was a focus of more participants in the providing condition (56.3%) compared to the planning condition (6.3%); however, many providers (43.8%) reported being unsuccessful with this goal because they failed to say everything that they had planned.

There were also a few differences related to the primary theories of deception. ‘Providing’ interviewees (81.3%) were more often concerned with controlling verbal cues than ‘planning’ interviewees (62.5%). In terms of emotions experienced, planners more often reported being nervous (96.2% vs. 75% of providers), particularly about being judged as deceptive (43.8% vs. 12.5%), and fearful (37.5% vs. 12.5%).

Scaled measures. The scaled measures were developed in order to supplement qualitative measures. While the qualitative information provides a greater depth with which to understand of lying, Likert scale questions succinctly describe participants’ emotions, motivations, and cognitions throughout the task. Responses to these questions demonstrated

that these psychological processes were all engaged, to a certain degree, during the task.

Correlations between measures of these theories, as well as memory reconstructions, suggests that these theories are interdependent.

All questions were measured on a 7-point Likert scale (see Appendix C). Participants rated their excitement ($M = 4.53$, $SD = 1.93$), attempted behavioral control ($M = 4.75$, $SD = 1.65$), perceived cognitive complexity ($M = 4.25$, $SD = 1.76$), and comfort lying ($M = 4.19$, $SD = 1.62$) all significantly greater than the midpoint (i.e., 3.5), $t's(31) \geq 2.382$, $p's \leq .024$. They also reported feeling less guilty ($M = 2.63$, $SD = 1.45$) than the midpoint, $t(31) = -3.405$, $p = .002$. No other measures differed significantly from the midpoint ($p's > .05$). See Table 10 for all scaled measure means and standard deviations.

It would be reasonable to hypothesize that levels of emotion, impression management, and cognitive complexity would increase when moving from planning to providing; however, t -tests comparing responses from participants in these conditions only found differences in excitement (Plan $M = 5.31$, $SD = 1.78$, Provide $M = 3.75$, $SD = 1.81$), $t(30) = 2.47$, $p = .02$, $d = .87$, and comfort level (Plan $M = 5.07$, $SD = 1.28$, Provide $M = 3.38$, $SD = 1.50$), $t(30) = 3.37$, $p = .002$, $d = 1.21$.

Examining correlations between these measures could provide interesting insight into how the theories of deception (including memory reconstruction) and participant level of comfort are interrelated. It is important to note that all correlations are exploratory and have low power. They should only be used as support for other findings and as a tentative guide for future research questions. Only significant correlations will be reported in this section (see Table 11 for all correlations). The measure of gist versus verbatim was negatively correlated with reported cognitive complexity ($r = -.484$), suggesting that the more verbatim that was included, the easier

the task became. In terms of impression management, the degree to which participants monitored the interviewer was positively correlated with both level of guilt ($r = .409$) and cognitive complexity ($r = .427$), and was negatively correlated with participants' comfort levels with lying ($r = -.502$). Guilt was also positively associated with fear ($r = .368$) and negatively associated with level of comfort in lying ($r = -.386$). Finally, cognitive complexity was negatively correlated with level of comfort ($r = -.437$), indicating that the more difficult participants perceived the task to be, the more uncomfortable participants were in completing the task.

2.6 Study 1 Discussion

Participants in the current study showed significant insight into their thought processes during the lying process. There are several examples throughout the interviews that highlight the meta-cognitive skills participants used. One individual reported, “...*if I said I went out with some friends, that makes it seem like I could have committed a crime because friends when they were together get into some mischief more than anything else, so I said I was with my girlfriend so it was more believable*” (Interviewee 13). This individual recounted carefully weighing the benefits and consequences of perceived believability to determine exactly who he should include in his statement. Another reported “*I wanted to be as detailed as possible, but not overly detailed because nobody remembers exactly when and where and how something happened. So I was going to give general statements like I got to dinner around 6:20ish.*” (Interviewee 11). This commitment that most participants displayed to the study provides credibility to the conclusions drawn below.

Hypothesis 1. Somewhat consistent with Hypothesis 1, the results of Study 1 replicated some previous findings on the strategies of liars. A considerable percentage tried to make the

statements as truthful as possible (Hartwig et al., 2007) and incorporated real world situations (Stromwall et al., 2007). In contrast to Stromwall et al. (2006), a greater number of participants reported attempting to make their stories more complex rather than simpler. However, this strategy of using a complex statement was less common for participants who actually provided their statement (compared to reports from planners). When it came time to present their statement, they appear to have attempted to simplify it. This is likely in part due to the findings that some (15.6%) participants wanted to get the interview over with due to discomfort, while others reported forgetting to say everything that they planned (21.8%).

Hypothesis 2. The results also provided support for Hypothesis 2. Leins et al. (2012) and Bond and Speller (2010) contended that not only do individuals use as much truth as possible, but in the context of an autobiographical account, they most often use an experience that has happened before. While it appears that individuals do use familiar situations and frequently report using truthful information, upon closer inspection, only 18.8% of participants primarily relied on one or more exact experiences (verbatim) for their statements. Another 21.9% used verbatim for some of the activities in the stories and gist for others. A majority (59.4%) of individuals relied mainly on gist traces for their stories. When asked general questions regarding their strategies, participants frequently responded that they incorporated actual experiences. Other studies (e.g., Stromwall et al., 2007; Leins et al., 2012) stopped their analyses of strategies at this point. However, upon more comprehensive questioning, it became clear that participants were often not actually relying on vivid, episodic memories (i.e., verbatim). Instead they were simply using scripts of events with which they were quite familiar. Therefore, concern from Leins et al. (2012) regarding the utility of tools such as Reality Monitoring may be less problematic than it appeared.

While it may appear that use of verbatim would be most effective for liars, interviewees suggested logical reasons for why creating a story with gist might be most beneficial.

Interviewee 13 wanted to leave his story open and be flexible in order to avoid being ‘boxed in’ a lie during follow-up questioning. Then, if asked specifics, he said that he would rely on verbatim so he could think quickly, and add logical and sufficient detail on the spot.

Additionally, individuals may not have (good) memories of an experience for every situation.

Situational constraints for a lie may not allow an individual to use a displacement strategy.

Novel lies could afford individuals more flexibility in comparison to displacements—something that previous researchers did not consider when evaluating the use and value of novel lies.

An interesting yet perplexing finding regarding memory is that when comparing planners to providers, planners were more likely to primarily rely on gist, whereas providers more often used a mix of both gist and verbatim. It could be that as interviewees were put on the spot and began to provide a statement, they reverted to using stories for which they have vivid memories in order to make the task easier.

Hypothesis 3. While it is difficult to quantify the degree of success the study had in invoking the processes outlined in the three main theories of deception, participants did report the presence of these processes to a certain degree.

Impression management. Impression management was a strong focus for many participants. They wanted to portray general impressions such as honesty, calmness, seriousness, and friendliness/innocence. Friendliness and innocence were impressions not considered prior to the study and do not appear to have been discussed or examined in the literature. These impressions were not necessarily based upon the content of the lie, but rather were used in order

to build rapport with the interviewer and make the interviewee appear like a person who would not be deceptive.

Participants also made concerted efforts to leverage their understanding of deception detection by attempting to control a variety of specific behaviors. For many, these attempts were based on incorrect information acquired from television shows or other media sources. Not surprisingly given research findings that the average person incorrectly believes many nonverbal cues to be diagnostic of deceptions and does not tend to consider verbal cues, participants in this study reported attempting to control nonverbal behaviors more frequently than verbal or vocal behaviors. These differences increased when only examining responses to the more reliable, unguided PA questions. Highlighting these misconceptions, one participant actually cited a diagnostic verbal behavior but was incorrect in how it was related to deception. After spontaneously correcting himself (a cue to truthfulness) in his statement, he said “*but when I came back (to correct himself), I was ahh, like, I guess I failed*” (Interviewee 34). Conversely, the finding that participants considered more verbal and vocal cues in the providing condition than in the planning suggests that participants may indeed consider verbal cues nearly as often as nonverbal, just at a later stage in the process.

A final way that interviewees attempted to (or planned to) manage their impressions was by monitoring the interviewer. A majority of interviewees considered this in some fashion, mainly by observing the interviewer’s facial expressions in order to determine if s/he believed their stories, or by considering what the follow up questions might be and how they might be asked. For those who only planned the statements, it was difficult to explain exactly what information they would look for and how they would use it to their advantage. A sizable percentage of individuals who provided their statements reported that they were unsuccessful at

reading the interviewer's reactions. A likely reason for this is that the confederate was instructed to be unreactive so as not to influence the interviewees' statements. While these instructions did prevent participants from making use of the interviewer's reactions, similarities may exist between this situation and forensic contexts in which interviewers may likewise want to avoid providing participants with such information.

These efforts by interviewees to influence the situation illustrate an often overlooked phenomenon in the investigative interviewing literature. Interviewing techniques are focused on how the interviewer can manipulate the situation in order to obtain the desired information. However, it is clear that interviewees play an important role in this process. They are not simply a static character that is under the influence of the interviewer; they play an active role in this interaction.

Affect. A majority of participants experienced both nervousness and excitement. While excitement was not mentioned in the more reliable PA section, it is plausible that this is because participants did not consider this as an emotion when asked about their emotions in general. When directly asked about it, most participants readily recounted their excitement in trying to trick the interviewer and win the money. Guilt was only experienced by 25% of individuals and for most of these interviewees the level of guilt appeared relatively low. One likely reason for this finding is that while part of the guilt in liars is expected to stem from the act of lying, another predicted cause of guilt is from the situation about which they are lying to conceal. For instance, if someone is lying to cover up a crime they committed, affective theory predicts that they will feel guilty for committing that crime (Ekman, 1989). However, participants in the current study did not commit a transgression that would produce feelings of guilt. Interestingly, according to both qualitative and quantitative analyses, participants who provided their

statements were no more likely to be nervous than planners. In fact, planners mentioned being nervous more often in the interviews than providers. Furthermore, a higher rate of these planners reported that having to lie and potentially being judged as deceptive was a cause for this nervousness. It may be that participants were more nervous when first confronted with the task and the idea of an unknown interaction with the interviewer, but that they settled into the task once they began providing their statements, and the nervousness was therefore alleviated and sometimes forgotten.

Cognitive complexity. A majority of participants reported exerting cognitive effort at some point during the task; however, as with the affective responses, it is difficult to determine how this level of perceived difficulty compares to that of a real world situation. Participants referred to some of the issues that research has demonstrated make lying more difficult than telling the truth (Vrij, 2008): creating and keeping details of the story straight and consistent, and monitoring the actions of the interviewer.

Hypothesis 4. One major purpose of the study was to investigate whether strategies such as relying on gist versus verbatim would differentially influence theories of deception. The strongest evidence for this can be found when examining gist and verbatim strategies alongside perceptions of cognitive complexity. Many of the participants explained how using truthful events made it easier to create and remember details (62.5%), and more comfortable (40.6%) than alternatives. Additionally, when examining individuals who reported that the task was somewhat difficult, 75% (compared to 62.5% overall) used gist. Only 12.5% (compared to 18.8% overall) of these individuals used verbatim. The significant correlation between perceived cognitive complexity and level of gist versus verbatim supports this hypothesis as well. Given the support in deception research for cognitive complexity theory over the affective and

behavioral control theories, this relationship could have significant implications with regard to cues displayed by liars and in turn, deception detection.

Other exploratory findings. A major goal of qualitative research is not only to use findings as support for quantitative results in testing theories, but also to serve as a guide for future research. Qualitative studies can often uncover relationships that may not have been considered or examined otherwise. The current study discovered several trends that were not related to primary objectives of the study, but could have important and interesting implications.

Variation in responses. In general, not only were there many misconceptions regarding issues such as verbal and nonverbal behavior, but there also appears to be general disagreement in terms of strategies to use when lying. One-third of participants reported that they wanted to keep their stories simple, whereas two-thirds attempted to make them complex. A minority (18.8%) reported trying to make their stories unique, while 84.4% chose to create statements based on everyday/typical situations. As mentioned previously, a majority relied primarily on gist, others on verbatim, and still others on a mix of the two. Twenty-five percent reported attempting to maintain a serious mannerism and 40.6% treated the situation casually, as if the interviewer was a friend.

Some of these issues are not mutually exclusive. As discussed above, some participants mentioned wanting to make their statements detailed, but not too detailed. Other differences might be matters of perspective. For example, an individual wanting to keep the story simple might have a different perspective than someone reporting that they valued complexity, in terms of the degree of detail required for a story to be considered simple versus complex. While their intentions differ, these individuals might, in reality, create similarly detailed stories. However, even with this caveat, it appears that there is significant disagreement as to the best way to

formulate a deceitful autobiographical statement. Only one person explicitly said that they “*didn’t know how to formulate a believable lie*” (Interviewee 22), and many professed that they were good liars or knew how to lie from sources such as the media. Given the level of diversity and misconceptions found in responses, it appears that fewer people should have been so confident in their abilities.

Excusing lies. Responses regarding the motivations behind and benefit of using truthful details in statements were striking to note as well. Using truth in their statements seemed to make many participants feel like they were absolved of blame for lying. Two participants explicitly stated that they felt less guilty because what they were saying was at least partially true. One “*felt little to none because it happened*”, but then “*felt guilty towards the end because I didn’t plan what I was saying. I was coming up with things off the top of my head and from there on nothing I was saying was truthful*” (Interviewee 15). Many others made comments such as “*I didn’t want to come up with an actual lie*” (Interviewee 25), “*you’re not lying, you’re being truthful*” (Interviewee 2), and “*that’s why I thought it was really honest*” (Interviewee 35). It appears that adding truthful details to statements made participants perceive their accounts as less deceptive and therefore, less taboo. This may help to explain why people lie with regularity even when lying is condemned by society. People can create statements that are not entirely deceptive, and this relieves some of the responsibility they would otherwise feel for lying.

Experimental realism. One frequent criticism of deception research is that laboratory settings do not closely enough mimic actual forensic contexts where participants would have high motivations for lying and experience intense pressure while doing so. Therefore, lies may differ significantly between the two settings. Based on responses, it appears that participants in the present study were motivated to create successful deceptive statements. However, it is

important to note that the motivations reported in the present research (e.g., to test/prove lying abilities) may differ from those found in real life scenarios (e.g., to not to get caught). Therefore, even if participants' levels of motivation began to approach that of an individual in an actual forensic or social setting, the difference in how they were motivated could result in divergent behaviors. A slight majority of participants reported choosing strategies that they believed would most likely lead them to be judged as credible, and a sizable percentage also reported being intrinsically motivated to prove or test their abilities. All but one explicitly mentioned a desire to be believed in their interview. While several did mention money as an extrinsically motivating factor, typically this did not appear to be the primary motivation. Money as a motivator was mentioned just once in the more reliable PA section, and only one interviewee explicitly said that he would not have cared if it was not for the money. Additionally, as indicated above, a vast majority of participants reported experiencing at least some level of nervousness/anxiety and excitement in completing the task, with 25% reporting guilt. While the degree to which they experienced these emotions may be less than a forensic interviewing context, participants in the present study did feel the same emotions that would be expected in the real world. Furthermore, in examining responses regarding nervousness, 68.8% of participants reported being nervous about the situation of the interview rather than at the prospect of lying or being judged a liar (28.1%). Given these results, it could be inferred that a majority of truth tellers would also experience nervousness if they were in the same situation (i.e., being interviewed by a stranger in a small room and uncertain of how the interview would unfold). This finding supports a major criticism of the affective theory of deception—truth tellers can experience similar emotions as liars. This becomes problematic given that it is extremely

difficult, if not impossible, to discern the difference between nervousness due to a situation versus that caused by lying.

There were other interesting findings related to the time constraints of the task. Forty percent of participants reported using the first strategy and story that they considered. Real world situations would vary greatly in the time that individuals have to create truthful and deceptive statements. If participants were given more time, it is possible that strategies may have changed. On a related issue, half of participants who provided statements had the goal of sticking closely to their story, but very few were able to accomplish this goal. Most of these individuals noted leaving out some portion of their story. This may have been due in part to the amount of preparation time participants were given. If they had more time to prepare and practice their statement, they may have had fewer memory failures. Of course, if they had less time to prepare a lie, as would sometimes be the case in forensic contexts, participants may not have had time to come up with a strategy and statement, much less concern themselves with 'sticking to the story'.

Relationships between theories. Finally, while the relationship between memory and each of the primary theories of deception was of great interest in this study, it is also important to understand how the primary theories are interrelated. It was difficult to extract relationships using frequencies in the qualitative data; however, the exploratory correlations do indicate that these theories are related. Higher levels of impression management (i.e., behavioral control) appeared to make the task more difficult. Another form of impression management, monitoring of the interviewer, was associated with greater levels of guilt. Both task difficulty and guilt were in turn associated with level of comfort in lying. While these findings do not eliminate the

limitations to affective and behavioral control theories, using these relationships to work toward a more integrative approach should improve the overall understanding of deception.

Chapter 3: Influences of Lying Strategy on Cues Evinced (Study 2)

3.1 Introduction to Study 2

While cues in deceptive versus truthful statements have garnered much interest in the research, cue differences as a function of lie strategy have been virtually ignored. The findings from Study 1, that psychological processes are differentially associated with various lying strategies, could have considerable implications on cues to deception. Understanding the effects of these relationships on cues to deception could be beneficial in research aimed at improving deception detection abilities. Practitioners who have an idea of how someone may be lying could rely more heavily on diagnostic cues related to that specific strategy. Alternatively, a particular cue to deception may be an indication that an individual is using a particular strategy. This knowledge could then allow investigators to focus their questioning techniques appropriately.

Compared to lies of displacement, novel lies may be expected to contain higher levels of cues related to gist traces and semantic memory, and greater cognitive demand. Additionally, while it was difficult to extract associations between strategies and affective or behavioral control theories in Study 1, differences in cues associated with these processes may be found between these types of lies as well. If differences in cues between various lie strategies are found, this may explain some of the inconsistent findings in the cue literature where a particular cue is often found to be diagnostic of deception in one study but not in another. Those studies may vary in terms of the situational demands of the lie and therefore result in unique patterns of cues.

One of the few studies concerning linguistic differences between types of lies examined outright lies, omissions, and truths (Van Swol, Braun, & Malhotra, 2012). Each participant in

this study told an outright lie, a lie by omission, or the truth to a partner regarding an amount of money s/he had been given to share with the partner. Partner interactions regarding the allocation of money were transcribed and coded for linguistic cues. The researchers found that, compared to individuals telling outright lies, those who were deceived by omitting facts used fewer overall words, words of causation, third-person pronouns, numbers, and profanity.

Bond and Speller (2010) conducted the one other known study examining cue variation as a function of lie strategy. Participants, both felons and university students, first committed a mock crime. They were then asked to provide a truthful statement, a completely fabricated (novel) lie, a temporal displacement (i.e., describe what they had done earlier in the day for the time period in question), and a spatial displacement (i.e., describe their actions but claim to have been in a different location at the time of the crime). The participants also completed a mock job interview in which they told the truth about their job history, fabricated their work history, committed a temporal displacement (i.e., changed job timeline), and spatially displaced (i.e., changed locations of the jobs). Finally, to examine affective displacement, participants told the truth and lied about their feelings toward a person they disliked.

Analysis of the above statements found the felon population to have a higher voice pitch when affectively displacing compared to telling the truth. University students displayed a higher voice pitch when fabricating a statement compared to temporally displacing, and both of these strategies resulted in a higher pitch compared to when they told the truth. Verbal qualities of the statements (RM cues) were analyzed as well, but no differences were found. Bond and Speller's (2010) conclusion was that displacements, specifically temporal displacements, are different from novel lies, falling in between novel lies and truth on a perceived credibility scale.

There were, however, a few weaknesses to this study relevant to Study 2 of the current research. First, it is not known how participants created these “complete fabrications.” Participants each told a total of seven lies, but they were not debriefed regarding how they formulated any of these statements, nor were their statements analyzed to examine this. There was also no way of determining if participants actually followed the directions for each lie strategy. For example, it is unknown whether or not some levels of displacements were used in these lies. It is also not known if the displacements were complete displacements and that the participants did not use any fabricated details.

Second, voice pitch and reality monitoring cues (see below) were the only cues analyzed. While it was reasonable to hypothesize that these cues would differ among types of lies, examining a wider range of diagnostic cues would help to determine exactly how, if at all, lying strategies differ. Specifically, the present research examined cues associated with affective, cognitive, and behavioral control perspectives, in addition to those related to memory reconstruction (i.e., Reality Monitoring).

Diagnostic cues to deception. The present study analyzed cues to deception and truth that have been identified in the literature as diagnostic cues, and that are supported by affective, behavioral control, cognitive complexity, and memory reconstruction processes. For example, while affective processes might suggest that lying would affect gaze aversion, because research has determined that this cue is not indicative of deception, it was not included in this research.

DePaulo et al’s (2003) meta-analysis of the cue literature identified a number of diagnostic cues that are associated with one or more of the theories of deception. Negativity and nervousness are two cues that, according to affective processes, differ between liars and truth tellers. Negativity is defined as the judge’s overall positive or negative impression of an

interviewee's verbal, nonverbal, and vocal cues. Nervousness refers to the overall impression gained from verbal, nonverbal, and vocal cues regarding an individual's comfort level..

Attempted behavioral control processes suggest differences in spontaneous corrections and admitted lack of memory. A spontaneous correction occurs when a person corrects a detail in his/her story without prompting from another individual while admitted lack of memory refers to the act of simply admitting that one cannot remember a detail from the story. Finally, cognitive complexity processes predict differences regarding how hard the interviewee appears to be thinking, as well as logical structure (i.e., degree to which it is possible to reconstruct a statement on the basis of the provided information) and plausibility (i.e., how realistic a story is).

Reality Monitoring also identified several cues that are related to memory reconstruction: clarity/vividness, sensory information, spatial information, temporal information, logical structure, plausibility and cognitive operations. Clarity/vividness refers to the degree to which a statement is clear, sharp, and vivid as opposed to dim and vague. Sensory information involves the presence of information such as sounds, smells, physical sensations, and visual details. Spatial information criteria refer to information about locations or spatial arrangement of people or objects, and temporal information includes details about when an event happened or descriptions of a sequence of events. Finally, cognitive operations refer to inferences made by the speaker at the time of the event.

Study 2 investigated cue differences between two types of lies that people can potentially use. Participants were videotaped providing both truthful and deceptive (via one of two strategies) statements regarding their whereabouts on a particular evening. Two coders were then trained on the cues discussed above and coded both lies and truths for the presence or absence of these cues.

3.2 Study 2 Methods

Participants. Thirty-seven participants were recruited from Introduction to Psychology courses at UTEP to provide truthful and deceptive autobiographical narratives. Twelve of these participants were excluded due to manipulation check failures (i.e., participants failed to follow the instructions regarding the specific way they were to lie). Five others were excluded due to an extremely short truthful or deceptive statement (i.e., less than 45 seconds). This left 20 usable pairs of statements from participants (75% female, 90% Hispanic, with a mean age of 24.5).

Design. The current study implemented a nested design. Veracity (truth vs. lie) was a within-subjects variable as all participants provided both truthful and deceptive autobiographical accounts. Lying strategy (temporal displacement vs. novel lie) was nested within the lie condition of veracity. Half of the participants were assigned to use the displacement strategy for their lie and half the novel strategy. After exclusions, there were ten participants in each condition.

Materials.

Stimuli collection. A Canon Vixia HG21 HD Camcorder was used to record autobiographical statements.

Cue rating tool. Scales of cues from RM (Sporer, 1997) and the Psychologically-based Credibility Assessment Tool (PBCAT; Evans, Michael, Meissner, & Brandon, 2013) were adapted to create a composite scale on which to rate each of the cues of interest. These cues included: sensory details, spatial details, temporal details, admitted lack of memory, spontaneous corrections, cognitive operations, clarity, plausibility, logical structure, cognitive effort, negativity, and nervousness. See Appendix E for the RM and PBCAT measure and instructions, and Figure 1 for cues predicted to differ between groups based on each deception theory. Both

RM and PBCAT scales are relatively straight forward, reliably coded, and have been validated in prior research (Sporer, 1997; Evans, Michael, Meissner, & Brandon, 2013).

Procedure. Participants were greeted by a researcher and, after providing informed consent, were randomly assigned to either the temporal displacement or the novel lie condition as well as to an order in which to provide their statements (truth then lie, or lie then truth). They were then provided with instructions appropriate for their condition (see Appendix F). Both truthful and deceptive statements addressed the participants' actions on a particular evening from 6:00 pm to 11:00 pm. Those in the novel lie condition were told to create a story that, while it could involve events with which they were familiar, should not include any accounts that they had exactly experienced before. Displacement participants were instructed to take one exact experience from their memory to use for their autobiographical account and not to use any details that they did not remember actually experiencing. As with Study 1, participants were given \$5 and told that their interviewer was trained in detecting deception and that s/he would not know whether both statements were truthful, both deceptive, or one truthful and the other deceptive. If participants were able to convince the interviewer that both statements were truthful, they would keep the money. All participants kept the money at the conclusion of the task.

In order to minimize differences among participants in terms of the length of delay between the nights in question and the day of the interview, stimuli were collected on Monday and Tuesday. Individuals participating on Monday provided statements regarding Thursday and Friday evenings, and those participating on Tuesday did so for Friday and Saturday evenings.

Participants were given five minutes to prepare their statement and were then interviewed on camera beginning with the question: "Tell me everything that you can remember about your

whereabouts on *Thursday/Friday/Saturday* night between the hours of 6:00 and 11:00 pm.” After providing the lie (or truth), this procedure was repeated for the truth (or lie). Following both statements, individuals were debriefed to ensure that they had properly followed the statement instructions (i.e., appropriately used displacement or novel lies to lie and told the truth in the truthful statement). Questions 19-23 from the CTA interview questions in Study 1 (see Appendix A) were used for this debriefing. If an individual did not properly follow instructions, they were excluded from the stimulus set. After participation, individuals were debriefed, thanked, and given research credit.

Coding of cues. Autobiographical statements were coded for the presence of cues in deception and truth. Two independent coders were trained on the cues included in the measure. For RM cues, they read Sporer (1997), Vrij (2008; pp. 261-279), Masip et al. (2005), Vrij et al. (2004), and Sporer (2004). Additionally, coders read the training materials that explained the cues and their relation to truth or deception and were provided instructions on using the rating system (see Appendix E). They coded all statements for these cues blind to experimental condition (truth vs. displacement vs. novel lies).

3.3 Study 2 Hypothesis

It was hypothesized that truthful statements would contain the highest levels of cues to truthfulness (i.e., sensory details, temporal details, spatial details, admitted lack of memory, spontaneous corrections, cognitive operations, clarity, plausibility, and logical structure) and lowest levels of cues to deception (i.e., thought hard, negativity, and nervousness), followed by lies of displacement, and finally, novel lies.

3.4 Study 2 Data Analysis

First, given that the goal of the present study is to examine differences between lies by forcing participants into a particular lying strategy, it was important to see if there were differences between types of lies in terms of how comfortable participants felt lying. If differences in comfort were found, it would be possible that cues differences found between statements were based on participants' comfort and ability to use the particular strategy, rather than theoretical differences between the lies. Therefore, a *t*-test compared participants' reported comfort levels in lying. Next, a series of multivariate analyses of variance (MANOVA) was conducted to test whether statement veracity of lying strategy affected the ratings of the cues. Only reliable cues were included in the analyses.

3.5 Study 2 Results

Reliability. Inter-rater reliability was calculated using Cohen's Kappa for details, admitted lack of memory, spontaneous corrections, and cognitive operations and correlations were examined for the remaining cues. Examination of reliability using Cohen's Kappa revealed fair to good reliability for each cue except spatial details (Fleiss, 1981). None of the correlations were significant. See Table 12 for reliabilities. There are a few potential factors that may have impacted reliability. First, given that there were only 40 videos, insufficient power was likely one limitation to these ratings. Second, five out of the six cues that had a more objective rating system were found to be significant. These cues had specific criteria for a rating in each of the three options. Conversely, none of the more subjective cues (e.g., clarity, negativity) which were rated on 9-point Likert scales attained sufficient reliability. These subjective cues are likely inherently more difficult to reliably code than cues that can be objectively measured. Coders' ratings were then averaged to obtain one rating for each cue.

Cue differences between strategies. The *t*-test comparing participants' level of comfort using each strategy was conducted. Comfort level did not significantly differ between strategy (Displacement $M = 3.80$, $SD = .68$; Novel Lie $M = 4.30$, $SD = 1.89$), $t(18) = 0.55$, $p = .587$.

Due to poor reliability for seven of the 12 cues and the fact that these same cues tended to demonstrate high collinearity, only effects of sensory details, temporal details, admitted lack of memory, spontaneous corrections, and cognitive operations were examined in these analyses. Additionally, averages of sensory and temporal detail ratings were summed to provide an overall measure of detail.

Given the manipulation of lies, not truths, if differences in cues should emerge between groups, they would be expected to be found between lies. Between- and within-subject MANOVAs were used in order to see if lie condition had an effect on cue ratings. As expected, one-way between-subject MANOVAs indicated a non-significant effect between truths, $F(4, 15) = .37$, $p = .826$, Wilks' $\Lambda = .91$, partial $\eta^2 = .09$ but a significant multivariate effect for lies, $F(4, 15) = 4.74$, $p = .011$, Wilks' $\Lambda = .44$, partial $\eta^2 = .56$. Follow-up univariate tests revealed significant effects for cognitive operations, $F(1, 18) = 6.52$, $p = .020$, partial $\eta^2 = .27$, and details, $F(1, 18) = 5.41$, $p = .032$, partial $\eta^2 = .23$. See Table 13 for cue means. The directions of these effects were consistent with predictions. Just as truthful individuals tend to display greater levels of cognitive operations and details than liars, liars in the displacement condition were rated as having higher levels of these cues (Cognitive operations: $M = .550$, $SD = .41$; Details: $M = 2.25$, $SD = .82$) than those in the novel lie condition (Cognitive operations: $M = .050$, $SD = .16$; Details: $M = 1.4$, $SD = .81$).

Repeated measures MANOVAs to investigate differences in veracity on these cues for each strategy condition revealed a non-significant difference for the displacement condition, $F(4,$

6) = 2.23, $p = .182$, Wilks' $\Lambda = .40$, partial $\eta^2 = .60$. Truths and displacements did not differ on these cues. There was a marginally significant effect between lies and truths in the novel lie condition, $F(4, 6) = 3.32$, $p = .093$, Wilks' $\Lambda = .33$, partial $\eta^2 = .69$.

3.6 Study 2 Discussion

As expected, truths did not differ between conditions in terms of the cues interviewees displayed on any of the analyses conducted. This demonstrates that telling a displacement versus novel lie did not influence how people provided their truthful statement. In comparing cues displayed in each type of lie, individuals in the displacement condition provided significantly more details and cognitive operations. Both of these findings are consistent with hypotheses based on cognitive complexity theory and reality monitoring. Higher levels of these cues would be expected in statements that were easier to create and relied heavily on the truth (i.e., displacements). While an individual who makes up a story (i.e., novel lie) may be able to create a plausible and logical story, it would likely be difficult for that person to generate a level of detail equivalent to that of an individual who actually experienced an event (i.e., displacement). Additionally, creating references to thought processes may not be something that people consider when fabricating a novel lie. However, discussing thought processes at the time of the story as individuals recount an actual experience may be more natural.

There are a few potential causes for the limited findings in Study 2. First, the poor reliability attained for the subjective cues meant that potential differences on these cues could not be analyzed. Second, the study was severely underpowered. A majority of the cues examined with the measure used had small to medium associated effect sizes ($.2 > d > .42$). However, only 20 truths and 20 lies (10/condition) were examined. A study either examining more stimuli with two coders or using a larger number of raters with the same amount of stimuli could solve this

problem. Third, it is possible that there were other differences between these lies that the measure in the current study did not address. Given the differences that were found and these possible factors listed above, it is still plausible that there would be noticeable differences between displacements and novel lies that could influence the lies' detection rates.

Chapter 4: Influences of Lying Strategy on Deception Detection Performance (Study 3)

4.1 Introduction to Study 3

Research has observed improvements in deception detection abilities when individuals pay attention to diagnostic cues to deception (e.g., DePaulo, Rosenthal, & Zuckerman, 1980; Hauch et al., 2010). While the hypotheses for Study 2 were not all supported, given the caveats discussed above, it is plausible that these novel lies and displacements differ and that these differences may affect individuals' deception detection abilities.

Deception detection should be more difficult in situations where cues to deception are less frequent and less amplified (i.e., displacements) than those eliciting more frequent and stronger cues (i.e., novel lies). Moreover, if a detector focuses on the cues surrounding the truthful portion of a displaced lie (e.g., what a person did for dinner), neglecting those from the deceptive part (e.g., when they actually went to dinner), the statement should be more likely to be judged as truthful (Vrij, 2008). Given the effects of strategy on evinced cues, individuals should be able to better discriminate between novel lies and truths than displacements and truths.

Deception detection. Considering its potential implications, particularly in law enforcement and national security contexts, successful assessment of credibility would be a useful skill to possess. In contrast to the shortage of research examining strategies and decision-making processes of liars, decisions of lie detectors have been studied in greater depth. Unfortunately, this research has consistently and overwhelmingly found that deception detection is a task at which humans are not particularly adept.

A meta-analysis by Bond and DePaulo (2006) determined that, on average, humans detect deception with approximately 54% accuracy (only slightly greater than chance performance). Furthermore, individuals are more accurate in detecting truth (61%) than

deception (47%). This can partially be explained by a tendency of the lay person to trust that others are telling the truth (known as a truth bias). Meissner and Kassin (2002) found that experienced and trained individuals, such as law enforcement officials, are no more accurate than lay persons in detecting deception, but that they do exhibit a lie bias (a tendency to judge statements as deceptive) in comparison to the average individual's truth bias.

Given the fact that the choice of lying strategy has received little attention in research to date, it is not surprising that there is also very limited research examining differences in deception detection ability for different lying strategies. In the only known study to investigate this, Vrij and Baxter (1999) compared elaborations (extensive statements) to denials (limited verbal information), finding no differences in overall lie detection accuracy. They did, however, discover a truth bias for elaborations and a lie bias for denials.

Study 3 sought to determine whether differences in detectability existed between displacements and novel lies. Participants viewed the same videotaped statements from Study 2. They then made veracity judgments for each statement and indicated which cues (from those examined in Study 2) were most useful in their decisions.

4.2 Study 3 Methods

Participants. A power analysis with an estimated effect size of $d = .4$ (Bond & DePaulo, 2006), power = .80, and $\alpha = .05$ suggested that 156 participants were needed to detect a difference in accuracy between these types of lies if a difference existed. This effect size is a conservative estimate compared to that found in a meta-analysis of detection accuracy (Bond & DePaulo, 2006). This conservative estimate was used because the current study compared two types of lies, which should be more similar than a truth and a lie. One hundred and sixty participants (Age $M = 20.67$, $SD = 4.73$) were recruited to participate in the study from

Introduction to Psychology courses at UTEP. The sample consisted of 63.8% females and 81.3% Hispanics.

Design. Study 3 implemented the same design as Study 1. Lying strategy (temporal displacement vs. novel lie) was nested within veracity (truth vs. lie). All participants watched both truthful and deceptive videos. Half of these participants watched displaced lies, whereas half viewed novel lies.

Materials. The 40 usable autobiographical statements (20 lies and 20 truths) were divided into four groups. For the displacement condition, each individual's lie and truth were separated and five lies were grouped with five truths. This was repeated for the novel lie condition. The result was four sets of ten videos each, with two sets containing displacements and two containing novel lies. No set of videos had a deceptive and truthful statement from the same participant. Video orders were randomized and counterbalanced to control for order effects. A 32-inch television was used to display the videotaped statements.

Procedure. Upon arrival, participants provided informed consent and completed a demographics questionnaire. They were then seated in front of a television and presented with a set of ten videos. Following each video, they answered a series of three questions. First, "Do you believe that this individual was lying or telling the truth?" (Response: lie vs. truth). Second, on an 11-point Likert scale, "How confident are you that your response to the question above is actually correct?" (0%: *not confident at all, a complete guess*; 100%: *I am absolutely positive in my judgment*). Third, on an 11-point Likert scale, "What percentage of the statement do you believe was deceptive?" (0%: *the statement was not deceptive at all*; 100%: *the statement was completely deceptive*). Given that the present research views lies and truths on a continuum rather than a dichotomy, the percentage deceptive measure is more relevant to the task than a

measure that forces participants into a binary decision. Use of a continuous measure such as this has not been reported in any known previous deception studies. Participants were also asked to report if they knew any of the interviewees; however, judgments of these cases were included in the analysis because in all eleven cases the interviewee was just familiar to the participant, not a friend. After making judgments on all ten videos, participants rated their reliance on each of the cues from those examined in Study 2 to determine if untrained individuals could determine any cue differences. In addition to the scale (see Appendix G), participants were given definitions and examples for each cue. Finally, individuals were debriefed, thanked for their participation, and given research credit.

4.3 Study 3 Hypotheses

Hypothesis 1. Because the strategy manipulation (displacement vs. novel lie) was nested within the lie, differences between strategy conditions were expected for lie, not truth, accuracy. Novel lies were hypothesized to be identified more accurately than displacements.

Hypothesis 2. It was also predicted that perceived differences between truths and novel lies on the question “What percentage of the statement do you believe was deceptive?” would be greater than between truths and displacements. In essence, on a continuum, displacements would appear more like truths than novel lies.

4.4 Study 3 Data Analysis

Given that the experimental manipulation was expected to only affect on lie, not truth, accuracy, the recommended technique of using signal detection theory estimates to analyze accuracy in deception judgments (Meissner and Kassin, 2002) was not relevant for the present study. These estimates would only be important to use when hits (i.e., lies correctly identified as lies) and false alarms (i.e., truths incorrectly classified as lies) may differ. In the case of the

current study only hits would be expected to be influenced by the manipulation. Therefore, accuracy rates for both lies and truths were averaged for each participant for analysis.

Percentage deception and confidence ratings were also averaged for lies and truths. A series of 2 (Veracity: Truth vs. Lie) x 2 (Lie condition: displacement vs. novel lie) ANOVAs was then used to examine the effect of these conditions on both dependent variables. Simple effects were then examined for any significant interaction. *T*-tests were then used to compare individuals in the displacement and novel lie conditions on their reliance upon the cues examined in Study 2.

4.5 Study 3 Results

Analysis of accuracy revealed a main effect for veracity, $F(1, 158) = 97.46, p < .001, \eta_p^2 = .38$, but no main effect for lie condition, $F(1, 158) = 1.79, p = .183, \eta_p^2 = .01$. A significant interaction qualified these results, $F(1, 158) = 4.58, p < .034, \eta_p^2 = .03$. Simple effects revealed higher truth than lie accuracy in both the novel lie condition (Truth Accuracy: $M = .610, SD = .21$; Lie Accuracy: $M = .400, SD = .25$), $t(158) = 5.483, p < .001, d = .91$, and displacement condition (Truth Accuracy: $M = .638, SD = .21$; Lie Accuracy: $M = .311, SD = .22$), $t(158) = 8.471, p < .001, d = 1.52$. These findings demonstrate a truth bias that is often found in samples with little experience or training in detecting deception. Additionally, as would be expected, since instructions for the truths were identical for each condition, there was no significant effect between novel lies and displacements, $t(158) = 0.810, p = .419, d = .13$, on truth accuracy. However, a significant difference was found for lie accuracy in that novel lies were more accurately identified than displacements, $t(158) = 2.398, p = .018, d = .38$. See Figure 2 for accuracy rates.

The ANOVA for the percentage deceptive measure found a significant main effect for veracity, $F(1, 156) = 6.84, p = .010, \eta_p^2 = .04$, where lies were rated as containing a greater

percentage of deception ($M = 35.5$, $SD = 22.0$) than truths ($M = 30.8$, $SD = 15.0$), and a significant main effect for lie condition, $F(1, 156) = 5.63$, $p = .019$, $\eta_p^2 = .04$, with statements in the novel lie condition being rated as more deceptive ($M = 36.0$, $SE = 1.7$) than those in the displacement condition ($M = 30.3$, $SE = 1.7$). The interaction was not significant, $F(1, 158) = 97.46$, $p = .349$, $\eta_p^2 = .01$. However, given that the predictions for the current study involved differences in lie accuracy only, follow up tests examined differences between conditions in lie and truth accuracy. As expected, tests revealed no significant difference for truthful statements (Percentage Deceptive in Novel condition: $M = 3.283$, $SD = 1.38$; Percentage Deceptive in Displacement condition: $M = 2.882$, $SD = 1.59$), $t(156) = 1.691$, $p = .093$, $d = .27$, but found that novel lies were rated more deceptive ($M = 3.907$, $SD = 2.50$) than displacements $M = 3.182$, $SD = 1.75$), $t(156) = 2.112$, $p = .036$, $d = .34$. See Figure 3 for percentage deception ratings.

No significant differences were found for between-group or within-subjects tests on participants' confidence ratings (p 's $> .05$). See Figure 4 for confidence estimates.

There were no specific hypotheses regarding differences between novel and displacement conditions on cues that participants relied upon in making their judgments given that participants had not been exposed to these cues until after all judgments were made. Furthermore, apart from findings in Study 2 regarding level of detail and cognitive operations, coders who were actually trained to use these cues were not particularly successful at differentiating between novel lies and displacements. Nonetheless, it is important to know if participants relied more on certain cues when exposed to novel lies versus displacements. T -tests found no significant differences between groups (p 's $> .05$). See Table 14 for means and standard deviations for each cue.

4.6 Study 3 Discussion

As noted above, because instructions for truths were identical for each lying strategy condition, perceptions of truths were not expected to differ between conditions. The non-

significant findings of truth accuracy for novel lie versus displacements supports this notion. If a difference on this test had been found, it would suggest that the act of telling one lie or the other first (as half of the participants did) changed the way that participants told the truth. As predicted, significant differences for both accuracy and the percentage deceptive measure were found when comparing the lies in each condition. Participants were able to identify novel lies more often than displacements and also rated these lies as appearing more deceptive than displacements. The within-subjects comparisons on the percentage deceptive measure showed that participants successfully distinguished between lies and truths for novel lies, but not displacements. Finally, while the significant main effect of veracity also illustrates the truth bias in that, consistent with previous research, participants had a propensity to judge statements as truthful (i.e., truth bias).

While Study 2 did not find as many differences in behavioral cues as expected, Study 3 showed that participants were able to perceive either the differences that were found (i.e., level of detail and cognitive operations), or differences in cues that Study 2 did not investigate. As expected, novel lies were easier to identify than displacements. This is likely due to the fact that displacements, which contain higher levels of truth than novel lies, contain fewer cues to deception (more details and cognitive operations), making them appear more like truths.

Chapter 5: General Discussion

The purpose of the current research was to gain a better understanding of the strategies individuals use to lie, the relationships between these strategies and psychological processes underlying deception, and the implications of these interactions on perceptions of deceptive statements. Taken together, the results of the three studies indicate that people do use various strategies to lie, and that these strategies can affect both perceptions of behavioral cues and detectability of lies.

Study 1 demonstrated that people use a wide variety of strategies in creating deceptive statements. One major strategic focus of participants involved using familiar details in their statement. However, the degree of familiarity (i.e., an actual experience/verbatim vs. gist) varied among participants. While previous researchers (e.g., Leins et al., 2012; Bond & Speller, 2008) suggested that individuals frequently use exact experiences in their lies, the focused questioning in Study 1 revealed that a majority of participants still used non-recollective (i.e., gist) rather than recollective memory (i.e., verbatim). Two frequently reported benefits of relying on familiar situations were that they made lies easier to create and helped participants feel more comfortable telling them. Although individuals referred to this advantage regardless of their use of gist versus verbatim, the negative correlation between the use of verbatim and cognitive complexity suggests that the more a story relies on truth (not merely familiar details), the easier lying becomes.

While there was no baseline group (truth tellers) to compare liars to in order to validate the primary theories of deception, interviewees did report emotions, behaviors, and cognitions related to these theories. More importantly, interview responses illustrated relationships among these theories. For example, as participants put forth greater efforts to control their behavior,

lying became more difficult, and these individuals felt more guilty. In the first part of this relationship, putting forth efforts to control their behaviors may have the indirect effect of evincing reliable cues to deception that are associated with cognitive complexity. Vrij, Mann, Leal, and Fisher (2010) took advantage of this relationship by requiring participants to maintain eye contact with interviewers (behavioral control) as a way of increasing cognitive load. This manipulation improved detection accuracy. However, in part due to the promise of cognitive complexity theory approaches to deception, recent research has been dismissive of affective and behavioral control theories. It is important not to ignore these latter two theories and their relationships with each other, as well as with cognitive complexity theory.

Study 1 also revealed interesting findings that were unrelated to the primary research questions. For example, whereas research has examined impression management while lying in terms of specific behavioral cues, participants indicated considerable focus on general impressions such as calmness, seriousness, friendliness, and innocence. These impressions could have a significant impact on the dynamics of an interaction. If participants' justification in using these strategies is correct, these impressions could increase the likelihood of a statement being judged truthful. Furthermore, much of the research on behavioral cues has examined their utility in actually distinguishing between lies and truths. Research has attended less to the impact that these cues and general impression management strategies have on interactions with, and perceptions of judges.

Another interesting finding was that many participants made reference to the fact that basing their lies on the truth seemed to alleviate some of the responsibility associated with deception. Only two of these comments were made when specifically addressing the issue of guilt; however, this could be a subject worthy of further investigation. Individuals who use

displacement strategies may feel less guilty about their lies, approaching the level of guilt felt by truthful individuals. This decrease in feelings of accountability for lies that incorporated the truth could help to explain the motivations for and propensity of deceptive behavior found in the real world. People seem more willing to lie when they can include more truthful information in their statements.

Study 2 examined truths and two types of lies that interviewees reported using in Study 1. While results did not support the hypotheses that these lies would differ on many of the cues that the literature has found to be diagnostic of deception, there were a few differences between these conditions in terms of cues evinced. Liars using displacements provided more details and cognitive operations than those telling novel lies. These results supported predictions based on both cognitive complexity theory and memory construction. Because participants in Study 1 who relied on truthful details (i.e., displacement strategies) reported lower task difficulty than those who did not use an actual experience (i.e., novel lie strategies), cognitive complexity theory suggests that these individuals should display more cues related to truthfulness (e.g., level of detail) than novel liars. Similarly, reality monitoring suggests that statements based on actual experiences will contain more details and references to cognitive operations than those based on imagined events (Sporer, 1997). Since verbatim is a memory of an actual experience, it makes sense that these statements would include greater levels of detail and cognitive operations.

Study 3 then demonstrated that, perhaps partly due to these differences in cues, lying strategy can affect detection abilities. Displacements, which rely on verbatim, appeared less deceptive, and were significantly more difficult to identify than novel lies relying on gist. DePaulo, Rosenthal, and Zuckerman (1980) found that accuracy improves when participants pay attention to diagnostic cues. Since both level of detail and cognitive operations have been found

to be indicators of truthfulness, participants assessing credibility in the displacement condition would have fewer diagnostic cues to attend to than those in the novel lie condition, thus making it a more difficult task.

Considered as a whole, these studies show that liars take a variety of approaches in order to successfully deceive. These approaches can result in differences in terms of cues displayed and, in turn, affect the decisions of judges. One common approach, which previous research has referred to (e.g., Stromwall et al., 2004) is that individual use familiar experiences in their stories. These familiar experiences can make it easier for individuals to create and provide lies, particularly when the experience is something that has actually happened. While Studies 2 and 3 only explored lying strategies differentiate by level of gist and verbatim, other strategies, including some discussed in Study 1, could have similar effects on speaker behavior. It is clear that lies should not be viewed in the overly simplistic manner with which much past research has tended to use.

5.1 Practical Implications

The results from the three current studies have significant implications for deception detection in contexts such as the criminal justice system. First, it is important to understand that people do lie in different ways. The fact that lies are often combined into one category in research may be one reason for the variation and inconsistency in findings regarding cues to deception. If the type of lie an individual uses can be identified, it may be possible to determine the most important cues to which a detector should attend during deception detection tasks.

While it would be difficult to discern specific strategies used in every lying situation, through certain interviewing techniques, it may be possible to either determine a likely implemented strategy or develop a set of techniques that together could more effectively identify

a wider range of lies. For example, questions focused on cognitive operations of senders at the time of the story may be particularly helpful in identifying novel lies, whereas questions intended to detect temporal displacements could focus on the extent to which the suspect's story matches the timeline of the period in question (since these displacements require that participants fit an already existing memory around a specific time frame).

Another questioning technique that could be particularly effective for displacements is the Strategic Use of Evidence (SUE) technique (Hartwig, Granhag, Stromwall, & Kronkvist; 2006). This interviewing method forces suspects to provide a statement before strategically introducing evidence throughout the interview that the suspect is then required to account for in his/her statement. As one individual from Study 1 who used gist framed it, *"You wanna leave room for, you know, like variability. You can add things in there if you want to. I feel like if you give an exact experience that doesn't leave room for anything like that. So yeah, a general storyline is more appropriate for that I think."* Depending on the details provided in displacements, these lies may be less flexible once told and it could therefore be easier for participants to get trapped into a lie when confronted with a technique such as SUE.

While there may be ways to improve detectability of each type of lie, it may also be possible to conduct interviews in a manner that will compel individuals to use more a novel approach to lying rather than displacement. Future research could investigate this possibility.

5.2 Limitations

While this research supports the ideas that 1) people use multiple techniques to lie about autobiographical accounts, and 2) differences in these strategies can lead to differences in perceptions of the lies, there are a few important caveats that should be noted.

First, Study 1 classified these strategies by reliance on gist, verbatim, or ‘half and half’. Studies 2 and 3 then forced participants to use only complete gist or complete verbatim. Perhaps the most important finding from Study 1 was that there is a wide spectrum of lying strategies that individuals use. Nearly half (46.9%) of participants in Study 1 used a mix (classified as either ‘half and half’ or ‘gist with verbatim for small details’) of gist and verbatim. However, as discussed above, information in working memory exists on a fuzzy-to-verbatim continuum (Brainerd & Reyna, 1990). Therefore, dichotomizing this variable for the purpose of a manipulation is overly simplistic, but also necessary first step in this research.

Another limitation to the present research relates to the applicability of displacements in the way that they were manipulated in Studies 2 and 3. Apart from having to report information from a single past experience, participants in the displacement condition were unrestricted in the way that they could lie. They could draw from any experience they chose. As a result, some may have used experiences that, had there been an opportunity to investigate their stories (as is frequently the case in forensic or general social contexts) might have been easy to disprove. For example, it could be easy to disprove the statement of a displacement participant who recounted a story about a large party with many witnesses. While a similar argument could be made for the novel lie condition, this factor may differentially influence the two types of lies because novel lies, compared to displacements, may be more flexible. Novel liars may find it relatively easy to piece together stories that would be difficult to disprove. Conversely, those using displacements may have greater difficulty thinking of actual previous experiences that would survive further investigation. Individuals’ memories for events that contain no disprovable facts may offer fewer vivid details and therefore, would appear less truthful. A related issue is that individuals may simply either not have a memory to draw on to fit every particular situation, or

may only have a memory from the distant past. In the latter scenario, individuals may have forgotten many details of the experience, which Study 2 suggested was a differentiating factor for displacement versus novel lies. Research finding faster rates of forgetting for verbatim, compared to gist traces (Brainerd, Reyna, Kneer, 1995; Gernsbacher, 1985) suggests that the temporal effects on memory accessibility would be an important factor in both choice and effectiveness of a novel lie versus displacement strategy. For all of these reasons, the fact that participants in the displacement condition were not as limited in their choices as is likely the case in the real world may have resulted in an underestimation of lie accuracy.

Finally, a frequent criticism of much of the deception research is that laboratory simulations do not closely enough mimic real world circumstances. In the present studies the use of a confederate interviewer appeared to successfully increase the arousal level of participants and they appeared to take the task seriously. A majority of participants reported feeling nervous and excited during the task. They also appeared to be sufficiently motivated based upon responses detailing their thought processes while planning or providing the statement (Study 1). While conditions still may not have reached the extent of an actual police interview, the above measures that were taken clearly improved the external validity of the research.

5.3 Future Research

While many people lie with relative regularity, great variability exists in the abilities of liars (Vrij, Granhag, & Mann, 2010). Therefore, many of the participants in Study 1 may have been poor liars. In fact, nearly one-third of participants in Study 1 confessed that they did not believe they were good liars. It would be interesting to perform this same interview with a sample of expert liars (such as criminals who are often considered experts; Bond & Lee, 2005) in order to discover strategies that the most effective liars use. Since these are the people that

detectors most struggle to identify, knowledge of their strategies would be particularly beneficial. Research across a variety of domains has found differences between experts and novices on information processing and decision making. For example, compared to novices, experts use more intuition-based strategies and declarative knowledge in decision making than novices (Ericsson, 2006). Spreading activation principles also suggest that experts, who have more developed networks and patterns to hold their knowledge, can more easily draw connections and patterns from information in order to make decisions more effectively (Feltovich, Prietula, & Ericsson, 2006).

As discussed above, the present research is just one early step in examining differences between lies. While it compared two different types of lies, further work is needed to examine the middle ground of these lies where people use either multiple verbatim experiences or a mix of gist and verbatim (in the middle of the fuzzy-to-verbatim continuum).

Certain situation factors may also influence both the strategy chosen and effectiveness of that strategy. In addition to the potential temporal effects of memory accessibility discussed above, strategy might depend on factors such as the context or target of the lie (e.g., interviewer). For example, someone may choose to use gist traces in a social lie where there is likely a lower chance of someone carefully scrutinizing the statement as would be the case in a forensic context. One strategy may also be more attractive than the other depending on if the target of the lie is someone that the liar either does or does not know well.

There are also other dimensions on which lies can differ. For example, there was disagreement among participants in terms of the level of complexity that a lie should contain, as well as how mundane versus extravagant the events surrounding a story should be. Further, lying via omission is another lying strategy that research has identified. These are lies grounded

in an actual experience and could be formed from any point on the fuzzy-to-verbatim continuum depending on how the information was processed and retrieved. Its categorization as a lie rests in the fact that the liar is attempting to give the target an impression that is untrue by omitting a crucial piece (or pieces) of information. Finally, although this study's aim was to investigate lies regarding autobiographical statements, people can also lie about beliefs, attitudes, and emotions. Rather than combine all of these lies, exploration of strategies within each type of deception, and the effects therein, could greatly advance the field.

Findings regarding the influence that interviewees attempt to exert through impression management during questioning has not been thoroughly studied. Some of these attempts, such as maintaining an appearance of innocence, seem to have been overlooked in research. Future research could investigate specific impression management strategies used by certain types of people or particular impressions individuals attempt to make in various situations. It would also be useful to determine what impact, if any, these efforts by interviewees have on the interviewer and subsequent interactions. For example, research could investigate if behaving casually and treating the interviewer like a friend makes a person's story appear more or less credible than one who displays a serious demeanor.

The purpose of Study 1 was to gain greater insight into the lying process, while Studies 2 and 3 sought to determine if different approaches to lying (gist vs. verbatim memory in this case) led to differences in perceptions of these statements. It is important to obtain a comprehensive understanding of the variety of ways that people choose to lie and how these lies impact cues evinced and detection of deception. Once the behaviors, cognitions, emotions, goals, and motivations of liars, as well as their impact, are better understood, research focusing on deception detecting and investigative interviewing can be most effective.

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Tables

Table 1

Study 1 Inter-rater Reliability (Cohen's Kappa)

Cue	Kappa	Cue	Kappa
Extrinsic motivation	.873	Unique situation	.613
Intrinsic motivation	.410	Everyday situation	.711
Appear truthful	.734	Make it personal	.310
Sound nice/innocent	.671	Timing of story	.602
Appear natural/casual	.887	Something logical	.529
Stay calm	.814	Influence of strategy	.592
Chose strategy because of believability	.218	Gist	.741
Delivery of story	.625	Verbatim	.796
Nonverbal cues (Yes)	.871	Half and half	.697
Nonverbal cues (No)	.890	Verbatim only for small details	.904
Verbal cues (Yes)	.655	Nervous	.784
Verbal cues (No)	.904	Fear	.760
Realized they were displaying a cue	**	Guilt	.818
Did things because of knowledge of lying	.778	Excitement	.714
Simple/complex	.540	Difficulty	.429

**one coder did not code 'yes' for any interview and Kappa could therefore not be calculated

Table 2

Study 1 Frequencies of Memory and Narrative Construction Strategies

Theme	%
Complex story	65.6
Simple story	34.4
Mix (complex and simple story)	21.9
Fabricated evidence	31.3
Too much detail would seem made up	21.8
Everyday situation	84.4
Familiar/typical events	68.8
Truth	75.0
Unique situation	18.8
Gist	59.4
Verbatim	18.8
Half and half	21.9
Get timing straight	62.5
Stick to story	31.3
Forgot details that were planned	21.8
Chose strategy for believability	56.3
First thing to mind	43.8

Table 3

Study 1 Frequencies of Impression Management: General Impressions

Theme	%
Appear casual	40.6
Appear serious	25.0
Remain calm	53.1
Appear Innocent/friendly	31.3

Table 4

Study 1 Frequencies of Behavioral Control

Cue	%
Legs/feet	9.4
Posture	9.5
Facial expressions	31.3
Arms/hands	46.9
Eye movement	50.0
Eye contact	40.6
Breathing	9.4
Contradictions	21.9
Speech fluency	34.4
Voice clarity	37.5
Ums/uhs	18.8
Tone	21.9
Rate of speech	15.6

Table 5

Study 1 Frequencies of Affect

Theme	%
Nervousness	84.4
Nervousness due to situation	68.8
Nervousness about lying	28.1
Guilt	25.0
Excitement	81.3
Excited for interviewer to believe	43.8
Excited for money	15.6
Excited for self	21.9

Table 6

Study 1 Frequencies of Cognitive Complexity

Theme	%
Required at least minimal difficulty	56.3
To create details	37.5
To keep details straight	53.1
Timing events in story	18.8
Follow up questions	18.8

Table 7

Study 1 Frequencies of Motivation

Theme	%
Generally cared about the task	84.4
Extrinsic motivation	34.4
Intrinsic motivation	37.5
Get task over with quickly	15.6

Table 8

Study 1 Frequencies of Attitudes toward lying

Theme	%
Don't like lying	15.6
Bad liar	31.3
Good liar	15.6
Unsuccessfully lied (provide only)	25.0
Successfully lied (provide only)	25.0

Table 9

Study 1 Differences in Responses between Plan Versus Provide Conditions

Cue	Plan condition (%)	Provide condition (%)
Complex	81.3	50.0
Everyday situation	75.0	96.2
Gist	75.0	50.0
Mix of gist and verbatim	6.3	43.8
Stick to the planned story	6.3	56.3
Behavioral control (verbal)	62.5	81.3
Nervous	96.2	75.0
Nervous about being judged deceptive	43.8	12.5
Fearful	37.5	12.5

Table 10

Study 1 Scaled Measure Descriptive Statistics (7-point Likert scales)

Measure	<i>M (SD)</i>
Gist (1) vs. verbatim (7)	3.72 (1.59)
Guilt	2.63 (1.45)
Fear	3.44 (1.70)
Excitement	4.53 (1.93)**
Behavioral control	4.75 (1.65)***
Cognitive complexity	4.25 (1.76)*
Monitoring of interviewer	3.58 (1.89)
Comfort lying	4.19 (1.62)*

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 11

Study 1 Scaled Measure Correlations

	Guilt	Fear	Excitement	Control	Monitor	Cognitive Complexity	Comfort
Gist/Verbatim	-.033	.249	-.065	.009	-.224	-.484***	.188
Guilt	–	.368**	.085	.283	.566***	.409**	-.386**
Fear	–	–	.270	.109	.070	.129	.060
Excitement	–	–	–	.225	-.015	.206	.315*
Control	–	–	–	–	.333*	.160	-.055
Monitor	–	–	–	–	–	.427**	-.502***
Cognitive Complexity	–	–	–	–	–	–	-.437**

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 12

Study 2 Interrater Reliability

Cue	Reliability
Sensory details	$\kappa = .580$
Spatial details	$\kappa = .054$
Temporal details	$\kappa = .587$
Admitted lack of memory	$\kappa = .513$
Spontaneous corrections	$\kappa = .636$
Cognitive operations	$\kappa = .500$
Clarity	$r = .146$
Plausibility	$r = .149$
Logical structure	$r = .191$
Nervousness	$r = .238$
Negativity	$r = .012$

Table 13

Study 2 Average Cue Ratings for Type of Lie MANOVA

Cue	Novel M (SD)	Displacement M (SD)
Details	1.40 (.81)	2.25 (.82)
Admitted Lack of Memory	0.30 (.42)	0.30 (.26)
Spontaneous Corrections	0.50 (.41)	0.60 (.70)
Cognitive Operations	0.55 (.60)	0.05 (.16)

Table 14

Study 3 Judge Perceptions of Cues

Cue	Novel <i>M</i> (<i>SD</i>)	Displacement <i>M</i> (<i>SD</i>)
Sensory details	5.40 (1.37)	5.43 (1.12)
Spatial details	4.38 (1.33)	4.71 (1.42)
Temporal details	5.05 (1.48)	5.23 (1.40)
Admitted lack of memory	3.53 (1.33)	3.41 (1.28)
Spontaneous corrections	3.31 (1.26)	3.16 (1.13)
Cognitive operations	3.18 (1.06)	2.96 (1.23)
Clarity	5.74 (1.01)	5.50 (1.04)
Plausibility	5.31 (1.06)	5.55 (1.08)
Logical structure	5.18 (1.19)	5.39 (1.29)
Nervousness	4.29 (1.70)	4.52 (1.45)
Negativity	2.76 (1.28)	2.91 (1.34)

Figures

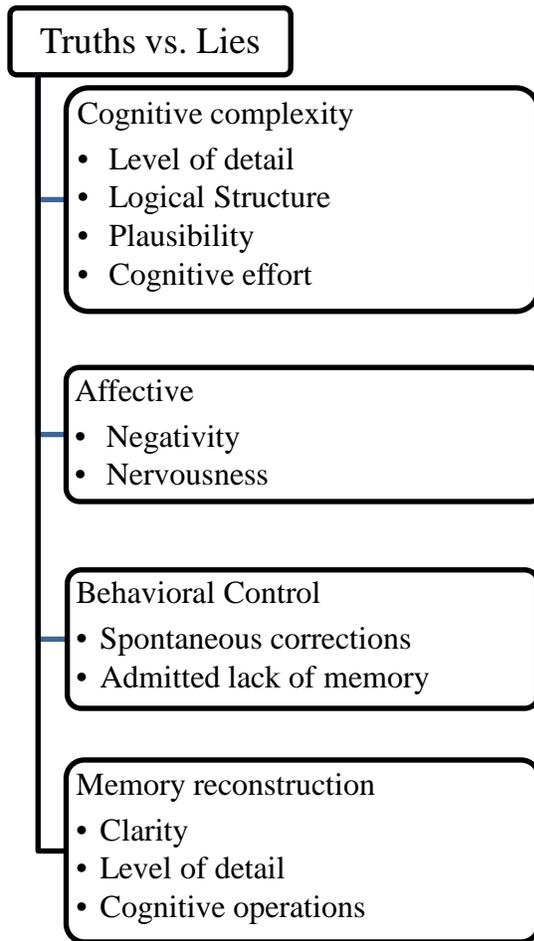


Figure 1: Cues to deception predicted to differ between groups based on theories of deception

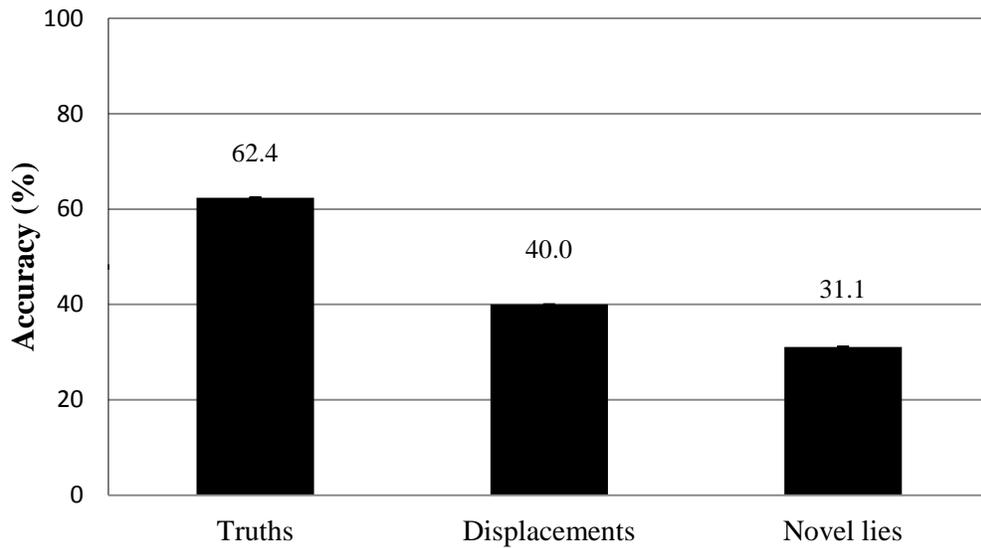


Figure 2: Mean accuracies for truths (averaged), novel lie, and displacement

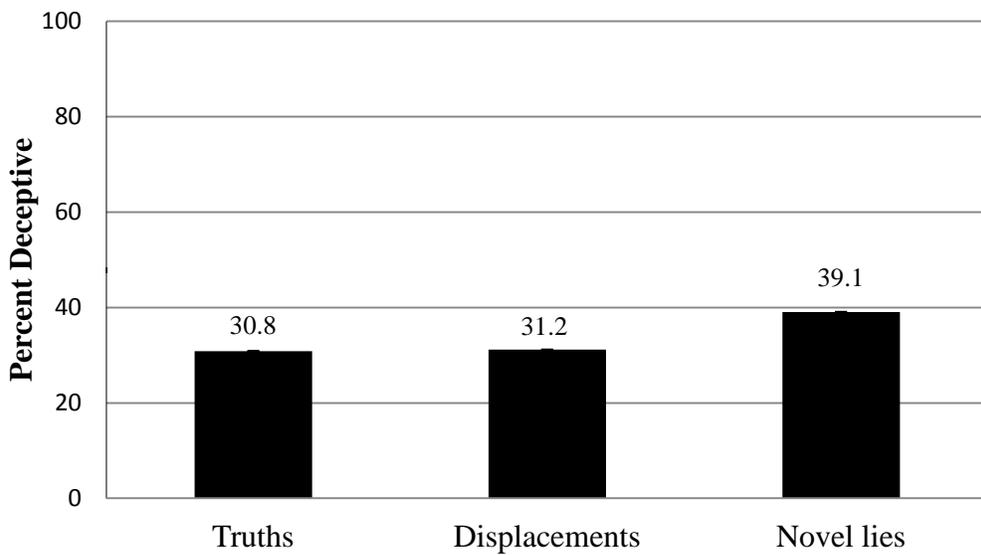


Figure 3: Mean 'percent deceptive' percentages of truth (averaged), novel lie, and displacement accuracies

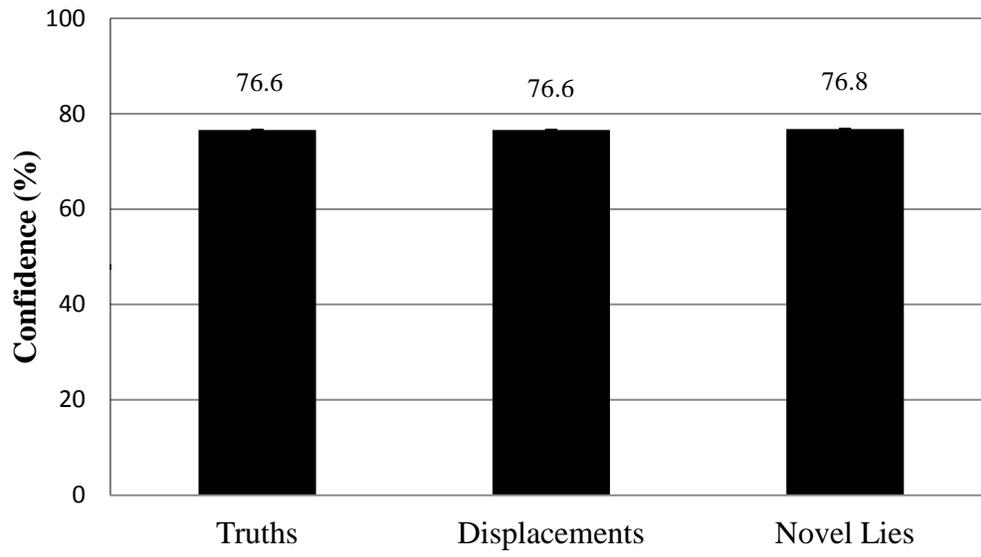


Figure 4: Mean confidence ratings for truths, displacements, and novel lies

Appendix A: Protocol Analysis and Cognitive Task Analysis Questions

Condition 1: Participants who planned their statement

PA undirected probe

- 1) “I am going to ask you to think aloud. This may be new and unfamiliar to you, but please know that there are no wrong answers, so you should not guess. I am only interested in knowing what is going through your mind. Your thoughts will help us learn about how individuals formulate autobiographical statements. Feel free to say anything that you’re thinking. I want you to close your eyes and think back to your planning session to provide your account. Take as much time as you would like to think about this time. As you are doing this, tell me out loud any thoughts that come to mind. Try to be as complete as possible.”
- 2) “Is that all? Okay, that was great. Now, people often provide additional information when repeating their thought processes for a second time. So I would like you to close your eyes again. Put yourself back into the context of planning your statement. Think of all the thoughts and emotions that came to your mind. Again, think out loud, reporting anything that comes to mind.”

Deepening (repeat back confusing points)

“Some of this may be repetitive, but please just try to answer the question fully. You may repeat yourself, but hopefully you can expand based on the specific question as well.”

- 1) Tell me about your goals and/or concerns during this process.
 - o *make sure they talk about goals AND concerns*
- 2) How long did it take you to decide how you wanted to provide your statement?
- 3) Tell me about the strategies you chose to use in order to come across as truthful and why you chose to use them.
- 4) Why did you choose to include the specific information you did?
- 5) What was it about the situation of this interview that made you believe the strategy and story you chose was the best one to use while providing the statement?
- 6) Did you consider other alternatives to your strategy to provide this statement?
- 7) What led you to reject this alternative?
- 8) Tell me about how hard you had, or did not have to think in order to create your statement to be believed by the interviewer.
- 9) Tell me about any emotions you experienced in having to create your account and anticipated experiencing when providing the account.
- 10) Specifically, to what extent did you experience guilt for having to providing your statement?
- 11) Fear or anxiety of potentially being judged deceptive by the interviewer?
- 12) Excitement at the possibility of leading the interviewer to believe you?
- 13) **Likert questions 1-3**
- 14) Tell me about your concerns regarding your perceived believability by the interviewer or other people who might judge your truthfulness.
- 15) To what extent did you consider controlling your behavior (verbal and nonverbal) in order to appear credible?
- 16) What specifically, if anything, did you plan to do in order to accomplish this?

- 17) **Likert question 4**
- 18) To what extent was monitoring the interviewer's behavior and reactions a concern?
- 19) **Likert question 6**
- 20) How hard did you have to work to keep the details of your story straight and consistent?
- 21) **Likert question 5**
- 22) Did you plan to rely on an exact previous experience as part of, or your entire statement?
- 23) *If yes:* Did you plan to rely on one specific experience or multiple experiences?
- 24) *If they report using a previous experience:* Were the details you planned on using in the story exactly how you previously experienced them or did you plan on using a general storyline you have for a "typical" scenario?
- 25) *If they referred to using scripts/gist/semantic memory:* Did you plan on using any details that did happen in a previous experience exactly as you planned to explain anywhere in your statement?
- 26) *If they referred to using verbatim:* Did you plan on providing any details that were not exactly as you experienced and, instead, were formed from your idea of a "typical example" of this part of your story?
- 27) Clarify their use of gist vs. verbatim. Was it one or the other for the entire story? A bit of each?
- 28) **Likert question 7 and 8**

Condition 2: Participants who provided autobiographical statement

PA undirected probe

- 1) "I am going to ask you to think aloud. This may be new and unfamiliar to you, but please know that there are no wrong answers, so you should not guess. I am only interested in knowing what is going through your mind. Your thoughts will help us learn about how individuals formulate autobiographical statements. Feel free to say anything that you're thinking. I want you to close your eyes and think back to when you provided your autobiographical account. Take as much time as you would like to think about this time. As you are doing this, tell me out loud any thoughts that come to mind. Try to be as complete as possible."
- 2) "Is that all? Okay, that was great. Now, I would like you to close your eyes again. Put yourself back into the context of providing your statement. Think of all the thoughts and emotions that came to your mind. Again, think out loud, reporting anything that comes to mind."

Video play-back

- 1) I'm going to play the video of you providing your statement. Please watch this and as it's playing, tell me what you were thinking or feeling. Consider it a play-by-play account of what's going on in your head for your statement. Please feel free to repeat yourself, but also expand on what you have previously reported.

Deepening (repeat back confusing points)

"Some of this may be repetitive, but please just try to answer the question fully. You may repeat yourself, but hopefully you can expand based on the specific question as well."

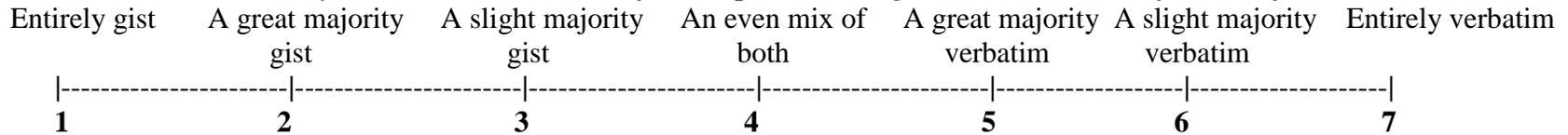
- 1) Tell me about your goals and/or concerns during this process.
- 2) What knowledge was necessary, helpful, or what would have been helpful in this situation?
- 3) Tell me about the strategies you used during the interview to come across as truthful and why you used them.
- 4) Did you change your strategy at any point during the interview?
- 5) Why did you choose to include the specific information you did?
- 6) What was it about the situation of this interview that made you believe the strategy and story you chose was the best one to use while providing the statement?
- 7) Did you consider other alternatives for your strategy to as you provided this statement?
- 8) What led you to reject this alternative?
- 9) Tell me about how hard you had, or did not have to think in order to provide your statement.
- 10) Tell me about any emotions you experienced in having to provide your account.
- 11) Specifically, to what extent did you experience guilt for having to providing your statement?
- 12) Fear or anxiety of potentially being judged deceptive by the interviewer?
- 13) Excitement at the possibility of leading the interviewer to believe you?
- 14) **Likert questions 1-3**
- 15) Tell me about your concerns regarding your perceived believability by the interviewer or other people who might judge your truthfulness in the future.
- 16) To what extent did you attempt to control your behavior (verbal and nonverbal) in order to appear credible?
- 17) What specifically, if anything, did you do in order to accomplish this?
- 18) **Likert question 4**
- 19) To what extent was monitoring the interviewer's behavior and reactions a concern?
- 20) **Likert question 6**
- 21) How hard did you have to work to keep the details of your story straight and consistent?
- 22) **Likert question 5**
- 23) Did you rely on an exact previous experience as part of, or your entire statement?
- 24) *If yes:* Did you rely on one specific experience or multiple experiences?
- 25) *If they report using a previous experience:* Were the details you used in the story exactly how you previously experienced them or did you use a general storyline you have for a "typical" scenario?
- 26) *If they referred to using scripts/gist/semantic memory:* Did you use any details that did happen in a previous experience exactly as you explained anywhere in your statement?
- 27) *If they referred to using verbatim:* Did you provide any details that were not exactly as you experienced and, instead, were formed from your idea of a "typical example" of this part of your story?
- 28) Clarify their use of gist vs. verbatim. Was it one or the other for the entire story? A bit of each?
- 29) **Likert question 7 and 8**

Appendix B: Study 1 Autobiographical Statement Instructions

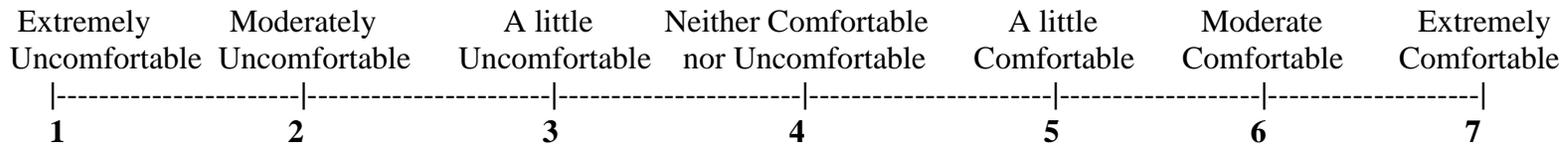
“Imagine that you are suspected of a crime that occurred between the hours of 6:00 pm and 11:00 pm on Friday night that you *did* commit. You want to do everything in your power to make your lie one that the interviewer will believe. You can lie in any way that will accomplish this. Use a strategy and story that will make yours believable.

Another individual who has been trained in detecting deception will be the one to interview you. This individual does not know whether you are lying or telling him the truth. It is their job to successfully determine which it is. It is your job to convince them that you are being truthful. If, after the interview, they judge you as truthful, you get to keep the \$5 I have given you. If, on the other hand, they correctly judge you as being deceptive, you have to give them the \$5. Do you have any questions?”

7. “Verbatim” is memory that consists of vivid, detailed representations of a past event. It contains sensory information (sights, smells, sounds, etc.). “Gist” is the general representation and “bottom line” memories you have of an event. This might involve memories of events, but those memories are based on your thoughts and reasoning of how the event took place, not an actual, vivid representation of it. If you are familiar with semantic and episodic memory, gist can be considered semantic memory and verbatim is episodic memory. *Please ask the interviewer for clarification if this does not make sense to you.* To what extent did you use/plan on using one or the other in your story?



8. To what extent did you feel comfortable lying in the way that you *did/planned to lie*?



Appendix D: Coding Scheme for Study 1

Video #: ____ Coder: ____

Motivators

- 1) Generally cared or didn't care about being caught/being believed (+I cared, -I didn't care) ____
 - 2) Extrinsic motivation – (+I yes, -I no) ____
 - a) Get money ____
 - b) Credit ____
 - 3) Intrinsic motivation – (+I yes, -I no) ____
 - a) Test abilities (see if a good liar, be best liar) ____
 - 4) Get it over with as fast as possible ____
- Other: _____
-

Impression Management/Behavioral control theory

- 5) General impressions
 - a) Appear truthful/honest ____
 - b) Sound nice/innocent ____
 - c) Appear natural (casual conversation) ____
 - d) Stay calm ____
 - e) Be serious ____
- 6) Chose strategy because believability by interviewer ____
- 7) Delivery of story ____
 - a) Don't make it repetitive ____
 - b) Stick to the story planned ____
 - i) Didn't say everything planned/forgot details ____
- 8) Non-verbal attempted control – *code "e" and "f" for if they mentioned it before or after prompt, respectively; code "g" if they are in the planning condition and say they would have thought about it when they provided their statements*
 - a) Yes ____
 - i) Hands/arms ____
 - (1) Crossed/in lap ____
 - ii) Legs/feet ____
 - iii) Eyes ____
 - (1) Contact ____
 - iv) Fingers ____
 - v) Facial expressions/mouth ____
 - vi) Touch head/hair ____
 - vii) Posture ____
 - b) No ____

- 9) Verbal/vocal attempted control – *code “e” and “f” for if they mentioned it before or after prompt, respectively; code “g” if they are in the planning condition and say they would have thought about it when they provided*
- a) Yes ____
 - i) Rate of speech ____
 - ii) Fluently/flowing ____
 - (1) No pauses ____
 - iii) Speak clearly/don’t stutter ____
 - (1) Ums/uhs ____
 - iv) Strong voice ____
 - v) Pitch/tone ____
 - vi) Contradict ____
 - b) No ____
- 10) Realized they were displaying a verbal or nonverbal cue while speaking (*provide only*) ____
- 11) Did things because they have knowledge of detecting deception (Lie to Me) ____
- 12) Monitoring of interviewer – *code “g” if they are in the planning condition and say they would have thought about it when they provided*
- a) Yes ____
 - (1) Questions they asked/would ask ____
 - (2) Facial expression ____
 - (3) Body posture/shifting ____
 - (4) Voice ____
 - ii) Started to but didn’t get any information ____
 - (1) Response would have depended on what they would say ____
 - iii) Actually changed strategy/behavior based on this ____
 - (1) Provide more detail/info ____
 - iv) Other _____
 - b) No ____
 - i) Would have been distracting ____
 - ii) Purposefully didn’t pay attention ____

Other: _____

Memory reconstructions

- 13) Formation of story
- a) Simple/complex (*+1 simpler, -1 complex*) ____
 - i) Simple/not detailed
 - (1) Don’t get blocked into a lie ____
 - (2) Story that would lead to few follow ups ____
 - (3) Too much detail would seem made up ____
 - ii) Complex/detailed

- (1) So it seems like I was there ____
- (2) Something that kept it busy ____
- (3) Create support for story ____
 - (a) Add witnesses, public ____
 - (b) Fabricate proof ____
- b) Unique/not too normal situation ____
- c) Everyday situation ____
 - i) Use familiar/typical things ____
 - (1) What I didn't do, but could have ____
 - ii) Use the truth ____
 - (1) Past memories/but not that day ____
 - (2) ½ truths ____
 - iii) Pieced together ____
- d) Make interview personal (for rapport with interviewer) ____
- e) Timing ____
 - i) Get timing straight, logical order ____
 - ii) Fit within time frame/take up the time (6-11pm) ____
- f) Something logical for story (e.g., students work) ____
- g) Repeat story to self ____
- c) Influence of strategy ____
 - i. Other strategy would be harder to create and remember details for ____
 - ii. More comfortable/less time to believe it themselves ____
 - iii. First thing to mind/fresh in mind ____

Other: _____

Gist/verbatim

- 14) Gist ____
- 15) Verbatim ____
 - a) One experience ____
 - b) Multiple experiences ____
- 16) Half and half ____
- 17) Verbatim for small details only ____
 - a) Verbatim for responses to specific questions ____

Other: _____

Emotional theory

- 18) Nervous/anxiety vs. calm (+1 calm, 0 not nervous, -1 nervous) ____
 - a) Anxious/nervous

- i) Situation ____
 - ii) Judged liar ____
 - iii) For self (challenge) ____
 - iv) When – planning, when he entered, beginning, follow-ups, when mess up (*circle one or more*) ____
- 19) Fear (+1 *fearful*, 0 *not*) ____
- 20) Guilt (+1 *guilty*, 0 *not*) ____
- a) Would have if real situation ____
 - b) None/less so since I had done it before ____
- 21) Excitement (+1 *excited*, 0 *not*) ____
- a) Yes
 - i) For person to believe story ____
 - ii) \$ ____
 - iii) For me to be a good liar ____
- 22) Other emotions (list) ____
- Other: _____
-

Cognitive complexity theory

- 1) Difficulty (+1 *easy*, 0 *neutral*, -1 *hard*) ____
- a) No/easy
 - i) Because it's familiar/the truth ____
 - ii) Lie a lot ____
 - b) Yes
 - i) For follow up questions/answers ____
 - ii) Details ____
 - (1) Creating them ____
 - (2) Keeping them straight ____
 - iii) Timing ____
 - iv) Planning vs. Providing (*provide participants only*) ____
- 2) Other:

Comments/notes:

Appendix E: Cues

Details	Not Present	Occasional	Frequent
Sensory Details	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spatial Details	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Temporal Details	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 	Not Present	Present (1 or 2 times)	Present (3 or more times)
Admitted Lack of Memory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spontaneous Corrections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cognitive Operations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 	Very Few Details/ Very Vague	Unsure	Numerous Details/ Very Clear
Clarity/vividness	----- ----- ----- ----- ----- ----- ----- -----		
 	Not at all Realistic	Unsure	Completely Realistic
Plausibility	----- ----- ----- ----- ----- ----- ----- -----		
 	Not at all	Unsure	Extremely
Logical Structure	----- ----- ----- ----- ----- ----- ----- -----		
 	Did Not Think Hard	Unsure	Thought Extremely Hard
Thought hard	----- ----- ----- ----- ----- ----- ----- -----		
 	Extremely Relaxed/ Comfortable	Unsure	Extremely Tense/ Nervous
Nervousness	----- ----- ----- ----- ----- ----- ----- -----		
 	Extremely Positive	Neutral/Unsure	Extremely Negative
Negativity/Complaints	----- ----- ----- ----- ----- ----- ----- -----		

Cue Information Materials

TRUTH Indicators

(a) Sensory Details:

-Are details provided regarding the *sounds* heard?

e.g., “It was really loud” “I heard a door slam shut” “Her dog was barking”

Please indicate whether there no auditory details provided (“Not Present”), there were several auditory details provided (“Occasional”), or whether there were many auditory details provided (“Frequent”).

(b) Spatial Details:

-Are details provided regarding *spatial* locations?

e.g., “The table was next to a window” “I turned right onto the highway” “I was sitting between Scott and Mike”

Please indicate whether there no spatial details provided (“Not Present”), there were several spatial details provided (“Occasional”), or whether there were many spatial details provided (“Frequent”).

(c) Temporal Details:

-Are details provided regarding *time*?

e.g., “I got there about 5 minutes later” “That was at about 10:25” “It was really late when I left”

Please indicate whether there no temporal details provided (“Not Present”), there were several temporal details provided (“Occasional”), or whether there were many temporal details provided (“Frequent”).

(d) Admitted Lack of Memory:

-At any point does s/he respond “I’m not sure” or “I don’t remember,” etc?

e.g., “I don’t remember what my mom ordered for dinner” “I don’t know when, but it was late”

Please indicate whether there was no admitted lack of memory (“Not Present”), lack of memory was admitted once or twice, or lack of memory was admitted three or more times.

(e) Spontaneous Corrections:

-At any point does s/he change his/her response or indicate a previous answer was wrong.

e.g., “Oh wait, Dave drove, not Eddie” “I said it started at 9, but I don’t think that’s right – it was earlier.”

Please indicate whether there were no spontaneous corrections (“Not Present”), there were one or two spontaneous corrections, there were three or more spontaneous corrections.

(f) Cognitive Operations (i.e., metacognition):

-At any point does s/he make inferences about their thoughts at the time of the event
e.g., “It appeared to me that she didn’t know the layout of the building.”

Please indicate whether there were no cognitive operations (“Not Present”), there were one or two cognitive operations, there were three or more cognitive operations.

(g) Clarity/vividness:

-Is the statement clear, sharp, and vivid (instead of dim and vague)?

Please indicate on a scale from “Very few details/Very vague” to “Numerous details/complete” how detailed the story was. If you are unsure, please mark “Unsure” in the middle of the scale.

(h) Plausibility

-Does the story make sense? Is it plausible? Is it believable? Or, are there any contradictions/discrepancies? Are you left feeling that something is off about the story?

Please indicate on a scale from “Not at all” to “Completely” how much sense the story made. If you are unsure, please mark “Unsure” in the middle of the scale.

(i) Logical structure

-Logical structure is present if the statement is coherent and does not contain logical inconsistencies or contradictions.

Please indicate on a scale from “Not at all” to “Completely” how well logically structured the statement is. If you are unsure, please mark “Unsure” in the middle of the scale.

DECEPTION Indicators

(a) Thought hard:

-Overall, how hard did s/he have to think to tell his/her story and answer the questions? Use verbal and non-verbal information.

Please indicate on a scale from “Did not think hard” to “Thought extremely hard” how hard the story-teller had to think. If you are unsure, please mark “Unsure” in the middle of the scale.

(b) Tension/Nervousness:

-Overall to you, does s/he appear anxious or is s/he comfortable? Consider both vocal and behavioral cues.

e.g., Is his voice tense? Is his posture rigid? Does he appear to be uncomfortable or nervous in the situation? Is he fidgeting? Does he avoid eye contact?

Please indicate on a scale from “Extremely relaxed/comfortable” to “Extremely tense/nervous” how nervous or tense the story-teller appeared. If you are unsure, please mark “Unsure” in the middle of the scale.

(c) Negativity/Complaints:

-Overall, does s/he leave you with a positive or negative impression? Consider his/her words and facial expressions.

e.g., If he complains, is difficult, or has a hostile tone of voice, this is more negative than if he is smiling, friendly and cooperative.

Please indicate on a scale from “Extremely positive” to “Extremely negative” what your impression of the story-teller was. If you are unsure, please mark “Unsure” in the middle of the scale.

Appendix F: Study 2 Autobiographical Statement Instructions

All:

“In this study, I will ask you to create two statements - one deceptive and one truthful. I will explain what I would like you to do for those statements in just one minute. Another individual who has been trained in detecting deception will be the one to interview you. This individual does not know whether you will be lying both times, telling the truth both times, or one of each. It is their job to successfully determine which each one is. It is your job to convince them that you are being truthful in each statement. If, after the interview, they judge you as truthful in both cases, you get to keep the \$5 I have given you. If, on the other hand, they correctly detect which one is a lie and which one is a truth, you have to give them the \$5. Do you have any questions?”

Truth:

“Imagine that you are accused of a crime that occurred between the hours of 6:00 pm and 11:00 pm on *Thursday/Friday/Saturday* night that you *did not* commit. You need to convince the interviewer that you are telling the truth. Think about everything you can remember from this time period. Remember, you are suspected of a crime, so you will want to do everything in your power to make your story convincing. Your story should be 100% truthful. Do not provide any information that is not truthful. Other individuals, in addition to the interviewer, will be watching this video and your job is to convince them that you are telling the truth.”

Temporal displacement:

“Imagine that you are suspected of a crime that occurred between the hours of 6:00 pm and 11:00 pm on *Thursday/Friday/Saturday* night that you *did* commit. You want to do everything in your power to make your lie one that the interviewer will believe. One strategy people use to lie that is very effective is to take what they did on a previous night and tell the story as if they did it on the night in question. I would like you to take your actual experience from a memorable night for which you remember the experience very well, and that would be believable on the night in question, and tell your story as if it happened on the night in question. Do not create details that you are unsure of. This is still a lie since you are claiming you did this at a different time than it actually happened. Therefore, you need to make sure to tell your story in a way that will be believable. This should be an event for which you have a strong memory. It should also be believable for the night in question. For example, if you are providing a statement about a Friday night, you should not describe your experience at a UTEP football game since those occur on Saturdays. Other individuals, in addition to the interviewer, will be watching this video and it is your job to convince them that you are telling the truth.”

Novel lie:

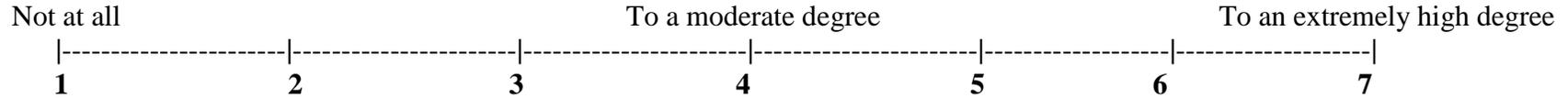
“Imagine that you are suspected of a crime that occurred between the hours of 6:00 pm and 11:00 pm on *Thursday/Friday/Saturday* night that you *did* commit. You want to do everything in your power to make your lie one that the interviewer will believe. One strategy people use that is very effective is to use their memories for what a typical weekend night might include. What I mean by this is that we all have scripts for how certain events go. For example, you might have a script of going to a bar where you first walk in the door and have your ID checked. Then you go up to the bar and order a drink and pay for that drink, etc. These are not

necessarily memories of a specific incident. They are frameworks that our memory has created to allow us to easily access and use it. Therefore, I would like you to use this type of memory to create a deceptive narrative. The story should not be something that you have exactly experienced. Remember, you are telling a story that needs to be believable, so make sure you think of and say everything you can to make it believable. Other individuals, in addition to the interviewer, will be watching this video and it is your job to convince them that you are telling the truth.”

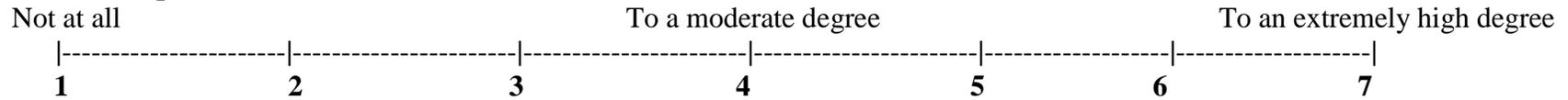
Appendix G: Cues Relied upon in Study 3

How much did you rely on the following cues to make your judgments in these videos?

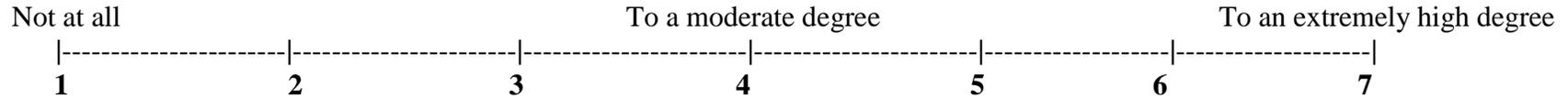
1) Sensory details



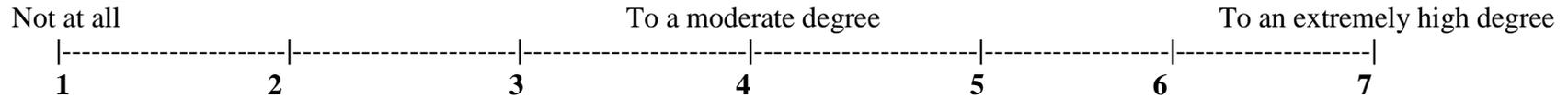
2) Temporal details



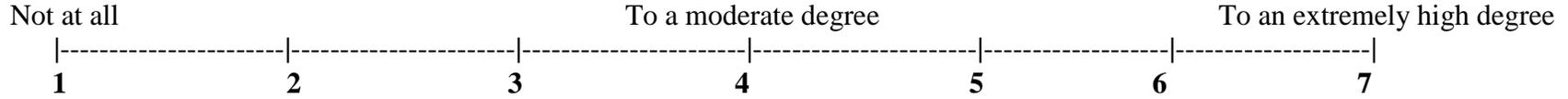
3) Spatial details



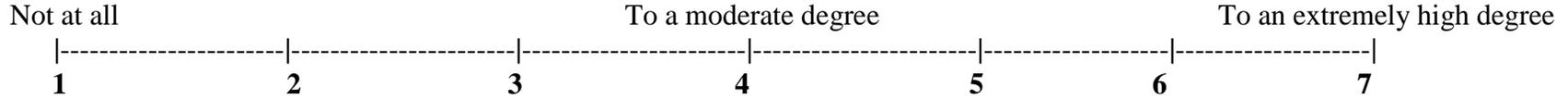
4) Spontaneous corrections



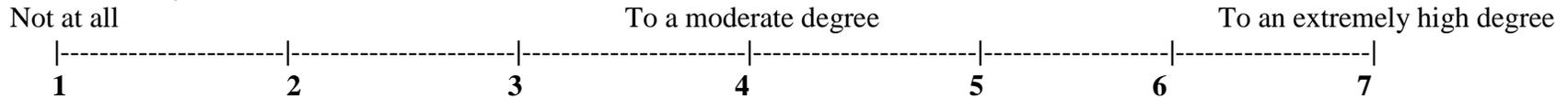
5) Admitted lack of memory



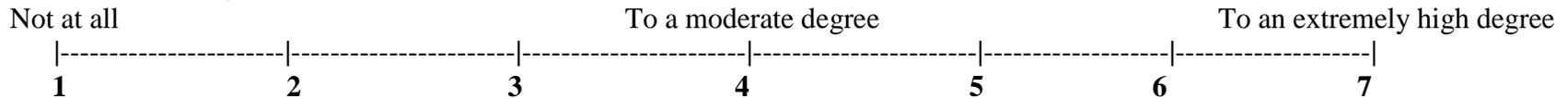
6) Cognitive operations



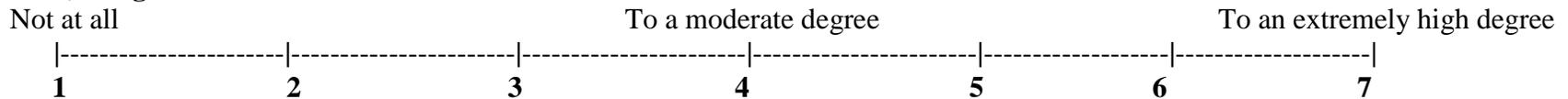
7) Clarity/vividness



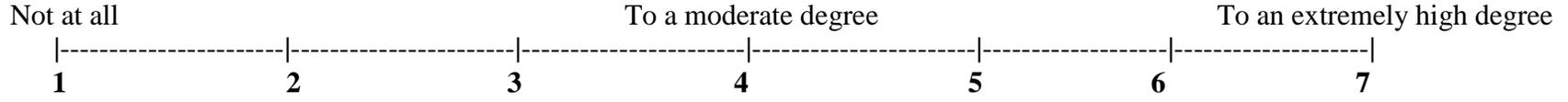
8) Plausibility



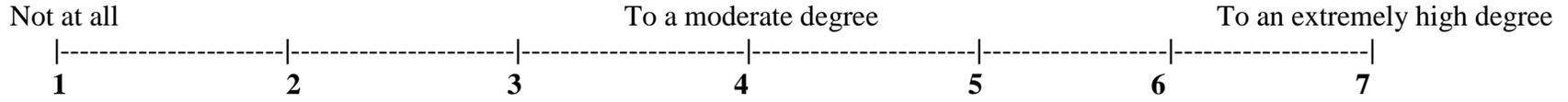
9) Logical structure



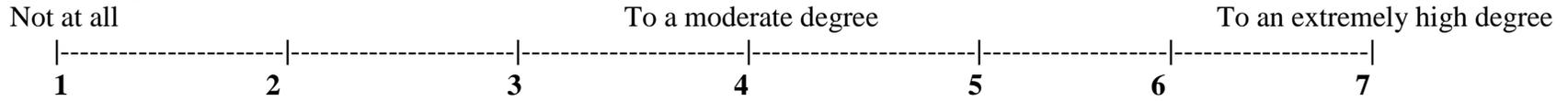
10) Thought hard



11) Nervousness



12) Negativity



Vita

Stephen Worth Michael was born on January 6th, 1986 in Conover, North Carolina. He is the third of four children by Douglas and Miriam Michael. In 2008, Stephen earned his Bachelor's degree in Psychology from Elon University in North Carolina. He entered the Psychology doctoral program (Legal concentration) at the University of Texas at El Paso in the fall of 2008, completing a Master's degree in Experimental Psychology in 2010. Upon graduation, Stephen will also receive a Certificate of Quantitative Methods in Psychology and a Certificate of College Teaching. In August of 2013, Stephen will join the Psychology Department at Mercer University in Macon, Georgia in 3-year Visiting Assistant Professor position.

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This thesis/dissertation was typed by Stephen Worth Michael.