

10-1-2014

Exploring The Illusion Of Transparency When Lying And Truth-Telling: The Impact Of Age, Self-Consciousness, And Framing

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EXPLORING THE ILLUSION OF TRANSPARENCY WHEN LYING AND TRUTH-
TELLING: THE IMPACT OF AGE, SELF-CONSCIOUSNESS, AND FRAMING

By

JASON MANDELBAUM

A dissertation submitted to the Graduate Faculty in Psychology in
partial fulfillment of the requirements for the degree of Doctor of
Philosophy, The City University of New York

2014

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This manuscript has been read and accepted for the
Graduate Faculty in Psychology in satisfaction of the
Dissertation requirement for the degree of Doctor of Philosophy

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Abstract

EXPLORING THE ILLUSION OF TRANSPARENCY WHEN LYING AND TRUTH-TELLING: THE IMPACT OF AGE, SELF-CONSCIOUSNESS AND FRAMING

by

JASON MANDELBAUM

Adviser: Dr. Angela Crossman

Individuals often overestimate the ability of others to accurately determine their internal states. This *illusion of transparency* has been shown to manifest itself in everyday scenarios, including when people are asked to estimate if others can tell when they are lying. Yet it has not been observed when truth-telling, nor investigated developmentally. The current experiments tested for an illusion of transparency when individuals were truth-telling and lying and investigated how a participant's age, dispositional self-consciousness, situational self-awareness and how questions were framed impacted the strength and prevalence of the illusion of transparency.

In Experiments 1 and 2, children and adolescents (ages 9 to 17; $n = 34$) and undergraduates ($n = 91$) participated in a lie/truth-telling game, during which participants made true and false statements corresponding to past real-life events. Half of their statements were mock video recorded to alter their state of situational, public self-awareness. Participants estimated the transparency of their statements while other players judged the veracity. When estimating transparency, participants were asked to determine the number of other players who thought they were telling the truth or the number of others who thought they were lying. In Experiment 3, 135 undergraduate students played the same lie/truth-telling game, but the

situational self-awareness manipulation varied between subjects and a mirror condition was added to investigate situational, private self-awareness.

Results from the studies provide evidence that an illusion of transparency exists among truth-tellers. Participants in all three studies overestimated the number of others who would believe them when telling the truth. However, an illusion of transparency was not observed when participants were lying. There was a consistent interaction between statement veracity and framing. When telling the truth, participant's predicted more transparency when questioned with the truth frame than the lie frame, but when lying participant's predicted more transparency when questioned with the lie frame. Differences in the illusion were not impacted by the grade level of participants, likely due to an absence of developmental differences in self-consciousness. Child and adolescent participants experienced a greater illusion of transparency when self-aware; however this did not replicate with adults. Implications and directions for future research are discussed.

Acknowledgments

I would like to thank and dedicate this dissertation to the two most important women in my life, my mom, Enid Mandelbaum and my fiancée, Liza Lipstein. Thank you for your love, support, patience, and understanding, even when it was extremely difficult to deal with me and my stress. Thank you to Angela Crossman for your tremendous help and guidance with this project and throughout my graduate school career, and to my research assistants Charles Leps and Danielle Nesi, without whose hard work in data collection I might never have completed these studies. Thanks to Saul Kassin and Maria Hartwig, whose input vastly improved this dissertation and to Ken Savitsky and Victoria Talwar for graciously volunteering to serve on my committee. Finally, I would like to thank all the family and friends who helped and supported me along the way to this degree. I never could have done it without you.

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CHAPTER 1: INTRODUCTION

False confessions occur at alarmingly high rates. The Innocence Project database shows that out of over 300 DNA exonerations, false confessions contributed to wrongful convictions in nearly 30% of the cases (<http://innocenceproject.org>; Garrett, 2011). Empirical research designed to investigate the causes of false confessions has focused on several key variables. One such factor is that innocent suspects can be misidentified during the early stages of an investigation and then placed in an interrogation setting, during which various interrogation tactics can be employed to increase the likelihood of a false confession. A reason that innocent people are often misidentified is that a police officer believes the suspect is lying during an initial interview. During this initial interview, police officers are often biased and rely on non-diagnostic cues to deception, which result in erroneous deception detection decisions (Kassin, Meissner, & Norwick, 2005).

Since people, including trained and experienced interviewers, often have difficulty telling truths from lies (Meissner & Kassin, 2002), it seems as though the safest and smartest thing any innocent suspect could do when arrested would be to invoke his/her *Miranda* rights and remain silent. However, research has shown that innocent people often waive their rights and place themselves in a potentially freedom-risking situation (Kassin & Norwick, 2004). It has been shown that people waive their *Miranda* right to silence because they feel as though they have nothing to hide and believe by talking, their innocence will be apparent to investigators (Kassin & Norwick, 2004). This oft-cited reason for *Miranda* waivers is an element of an *illusion of transparency*—a belief that one's internal state is more visible to others than it truly is. However, research investigating this phenomenon in lie/truth-telling scenarios has only found the illusion of transparency to exist among liars, but not among truth-tellers. Therefore, a primary purpose of

this series of experiments was to investigate the illusion of transparency when speaking both truthfully and deceitfully.

An additional focus of this research was to explore the development of this phenomenon among older children and adolescents because it is not clear how or when the illusion of transparency appears. Its emergence has yet to be investigated developmentally, despite the fact that the illusion might contribute to the prevalence of false confessions among youthful suspects. There are many documented cases of false confessions made by children and adolescents. Fourteen-year-old Michael Crowe falsely confessed to the murder of his twelve-year-old sister, Stephanie, as did Aaron Hauser, an innocent friend that Crowe had implicated. Twelve-year-old Anthony Harris, thirteen-year-old Tyler Edmonds, eleven-year-old Lacrecha Murray, ten-year-old B.M.B., all five of the teenagers suspected in the Central Park jogger case, and many others have given false confessions. Though the details in each of these cases differ, the fact that these children and adolescents were no match for the coercive psychological techniques used by police in their interrogations is something they all have in common. Though anyone can be vulnerable to the pressures of an interrogation, young suspects appear to be significantly more at risk. In a study describing 328 exoneration cases, 44% of juveniles gave a false confession, compared to 13% of adults. Among the youngest juveniles (12–15 years old), 75% falsely confessed (Gross, Jacoby, Matheson, Montgomery, & Patil, 2005). Similarly, Malloy, Shulman, and Cauffman, (2014) recently examined true and false admissions of guilt among serious male adolescent offenders. Of the adolescent incarcerated males included in this sample, 35% reported a false admission, and almost half of the sample claimed to have done so more than once. Additionally, a majority of youths reported that they had experienced high-pressure techniques when

interrogated, including some that might render a confession inadmissible in court (e.g., use of force, explicit threats, refusals; White, 2001).

Though Supreme Court cases have recognized the immaturity associated with youth (*Roper v. Simmons*, 2005) and their vulnerability in interrogations (*Gallegos v. Colorado*, 1962), research demonstrates that police use many of the same strategies and techniques when interrogating children as they do with adults (Redlich, Silverman, Chen, & Steiner, 2004). The Reid Technique for interrogations, a system employed by over 300,000 law enforcement personnel (http://reid.com/success_reid/r_success.html) teaches that the principles discussed with respect to adult suspects are as applicable for use with young suspects (Inbau, Reid, Buckley, & Jayne, 2013). However, developmental research explains that adolescents differ from adults in many ways that may make them more vulnerable in an interrogation or interview setting. Since the psychologically coercive tactics used during interrogations can potentially lead to a false confession, a goal of these studies was to examine the development of a reason why youths might be willing to subject themselves to a police interrogation—*the illusion of transparency*.

The illusion of transparency occurs when one expects his/her internal states to be more visible to or detectable by others than they actually are. Thus, the two components that make up an illusion of transparency in a deception/truth-telling context are internal feelings of transparency and the inability of others to accurately determine the veracity of true and false statements. However, besides our recent study investigating the illusion of transparency among young children (ages 6 to 11; Mandelbaum, Nesi, Carmel, Segovia, & Crossman, 2014), the illusion has only been explored in adult samples. The first of three studies investigated what develops to create an illusion of transparency in older children and adolescents (ages 9 to 17). The first study focused on children and adolescents for several reasons. Adolescents are

particularly at risk for false confessions due to their youthfulness (Kassin, 1997). Also, during late childhood and early adolescence, self-consciousness is developing and children's lie-telling abilities are growing and improving. These factors are explored because they may impact both feelings of transparency and the detection accuracy of others.

To examine the two facets that create an illusion of transparency, Study 1 investigated factors that impact children's and adolescents' feelings of transparency, specifically dispositional self-consciousness and situational public self-awareness, along with elements that influence lie/truth detectability, focusing on developmental growth in lie-telling effectiveness. Study 1 was conducted with older children and adolescents, and then replicated in Study 2 with an adult sample to compare differences in the illusion of transparency as a function of age. Study 3 was then conducted, concentrating on situational public and private self-awareness, while replicating the manipulation of potential predictors and correlates related to the illusion of transparency, such as the veracity of the statement made and how prediction questions are framed.

In the following sections, I review the current research on the illusion of transparency, the illusion of transparency among liars and truth-tellers, the role the illusion of transparency plays in police interviews/interrogations, and why it is particularly important to investigate this phenomenon among adolescents. Then, I briefly discussed the literature on deception detection, focusing on the development of children's and adolescent's effective lie-telling and on how the age of the speaker may impact deception detection accuracy. This is followed by a review of the literature on the development of self-consciousness and how self-consciousness and self-awareness may impact the strength and prevalence of the illusion of transparency. Finally, I consider how word choice and question framing can potentially impact one's predictions of the transparency of their statements.

CHAPTER 2: THE ILLUSION OF TRANSPARENCY

The *illusion of transparency* is a term used to describe the tendency to overestimate the extent to which others can accurately determine one's internal states (Gilovich & Savitsky, 1999; Gilovich, Savitsky, & Medvec, 1998). Though an individual is the only one who is truly aware of his or her inner thoughts and feelings, research in a variety of contexts has demonstrated that individuals believe that their internal states are more available to others than they actually are. It is not uncommon for individuals to claim that they are terrible liars because they believe that the person they are attempting to deceive will be able to "see right through them." Experiencing the illusion of transparency has been tied to social anxiety (Savitsky & Gilovich, 2003), may contribute to interpersonal conflict due to misunderstandings about how obvious one's feelings are to another (Gilovich et al., 1998), and plays a powerful role in negotiations, wherein even experienced negotiators consistently overestimate the transparency of their preferences (Van Boven, Gilovich, & Medvec, 2003). Additionally, and most applicable to the current research, the illusion of transparency is tied to expectations about whether or not one's lies will be detected and one's true statements believed. Thus, the illusion has the potential to impact the behaviors of individuals when their honesty is being scrutinized, such as in an interrogation (Hartwig, Granhag, & Strömwall, 2007). Indeed, variations of the illusion of transparency have often been cited as a reason that innocent people wave their *Miranda* rights, believing their innocence will be obvious to investigators (Kassin & Norwick, 2004).

One possible explanation for the illusion of transparency is that individuals experience the world through their own perspective and their own feelings are uniquely salient. People are acutely aware of and focused on their internal states, especially when they are strong, and have difficulty adjusting their phenomenology to the perspective of an observer. Even though people

are usually aware that others do not share the same perspective, and they attempt to adjust when estimating another's perspective, the anchoring and adjusting process is biased by their own subjective experience, leading to insufficient adjustments (e.g., Tversky & Kahneman, 1974). For example, the illusion of transparency has been found among adults attempting to disguise distaste after drinking something unpleasant (Gilovich, et al., 1998, Study 2a), and among those witnessing a staged emergency who believe their concern is discernible to onlookers (Gilovich, et al., 1998, Study 3). The illusion of transparency has been shown even in scenarios in which no statements are made. A study by Barr and Kleck (1995), in which participants' facial expressions were secretly recorded while they watched a humorous video, demonstrated that participants believed their expressions were more obvious than observers rated them to be. Participants were shocked at how inexpressive they were when they watched their own videos, relative to how they described their internal states. Thus, their highly salient internal feelings did not match their outward presentation and biased their perceptions.

The Illusion of Transparency When Lying

As noted above, it is possible that the illusion of transparency plays a role in forensic contexts—such as when a guilty suspect lies and law enforcement attempts to detect those lies. Gilovich et al. (1998) investigated the illusion of transparency in the context of deception detection and found consistent support for its existence in a series of experiments. Across three studies (1a, 1b, & 1c), lying participants consistently overestimated the proportion of observers who would be able to detect their deception. In the first of these variations, participants played a lie detection game in groups of five, in which players each received a question to be answered and a veracity requirement (to truthfully answer the question or to lie about the answer). The other participants in the group acted as lie detectors. The liar and the truth-tellers completed a

questionnaire after every round of five statements (which included one lie). Liars were asked how many participants would correctly determine that they were the liar, while truth-tellers tried to identify the liar among the other participants. The results showed that participants expected an average of 48.8% of other players to detect their lies, but only 25.6% of the lie detectors were actually correct. Analyses revealed this difference to be highly statistically significant, and the authors attributed the results to the illusion of transparency: liars felt as though their deception would leak out. A follow up study obtained similar results, yielding significant overestimations of observers' ability to detect lies (50% of liars believed they would be detected, but only 27% of observers were correct).

However, there are some elements of these studies (Gilovich et al., 1998) that require additional investigation. First, the research focused primarily on the illusion of transparency among liars, but not among truth-tellers (post-hoc analyses revealed no illusion among truth-tellers), and second, the participant-speakers were asked to estimate the likelihood they would be identified as the liar, when both lying and truth-telling. It is possible that the way the question was framed increased the salience of lying among liars, creating a stronger illusion of transparency among lie-tellers than truth-tellers. In order to explore these potential limitations, the current series of studies examined the illusion of transparency when both lying and truth-telling and varied whether participants are asked to make estimates of the transparency of their truths or their lies.

The third study conducted by Gilovich and colleagues (1998, 1c) was designed to dispute possible alternative explanations for the findings of the previous two studies. Possible alternate explanations of the findings were that liars' overestimates of how often they would be detected stemmed from either the perceived ease of lie detection tasks or the *curse of knowledge*, but not

the illusion of transparency. The curse of knowledge is the idea that when an individual possesses specific knowledge, it is difficult to put that knowledge aside when taking another's perspective (Keysar, Ginzel, & Bazerman, 1995). In this instance, the liars' knowledge was that they were lying, and if they projected that knowledge onto others, they may overestimate the detectability of the deception. Though this explanation is similar to the illusion of transparency, it differs substantially from the perspective of the liar because the illusion of transparency includes underlying feelings of leakage and transparency (Gilovich et al., 1998).

In this third experiment, a specific observer was yoked to each potential liar. The observer was given the same information as the participant, thus he or she was in possession of the same knowledge as the speaker. All participants and the observers then estimated the number of people who would be able to detect the deception. The authors hypothesized that because the observers do not speak, they would be immune from any personal feeling of transparency. Since the knowledge of the task and condition were identical for liars and observers, any differences found between observers and liars would demonstrate an illusion of transparency. Again, liars overestimated how often they would be detected (44.3%, when in fact only 32.4% were detected). Of more interest in this context, the yoked observers predicted only 25.3% of the deceptions would be detected, significantly fewer than the 44.3% prediction by the liars, giving strength to the idea that the illusion of transparency is behind the overestimates of the detectability of lies (Gilovich et al., 1998). However, once again, the illusion of transparency when truthful was largely ignored in this study, even though it may play a substantial role in applications of the illusion of transparency research, such as in police interrogations and negotiations. Due to the potential real-life consequences of the illusion of transparency in

interviews and interrogations, it is critical to study the illusion of transparency among truth-tellers as well.

The Illusion When Truthful

Though the studies above robustly indicate an illusion of transparency in the domain of lie detection, these data only allow for a test of increased feelings of detectability when lying, not offering much of an explanation regarding the prevalence of the illusion of transparency when individuals are telling the truth. In fact, Gilovich and colleagues specifically doubt that the illusion of transparency exists among truth-tellers. Citing Ekman (1985), the authors state that when telling the truth, there is no strong internal experience on which to anchor one's judgments of leakage, and that the act of lying generates a host of emotions that can leak out. They conclude that, in the absence of a strong internal sensation from which to anchor and adjust, there is no illusion of transparency (Gilovich et al., 1998).¹ However, truth-tellers also may experience emotion during a deception detection situation (DePaulo, 1992; DePaulo et al., 2003). For example, truth-tellers may feel uncomfortable in interview settings when their veracity is questioned, such as in a police interrogation. Truth-tellers may make efforts to appear convincing, because they too face negative consequences if they are deemed liars. If the process of truth-telling is emotional, it may create a strong enough internal experience from which to anchor and adjust. Indeed, there is laboratory and "real-world" evidence suggesting that the illusion does impact truth-tellers, as well as liars, in applied settings. Differences in feelings of transparency between liars and truth-tellers may also stem from differences in motivation. Truth-

¹ The authors note that data regarding the illusion of transparency among truth-tellers in this study should be interpreted with caution because they were created by reverse scoring participants' estimations of the detectability of their lies.

tellers are motivated to convey information whereas liars are motivated to conceal information (Cameron & Vorauer, 2008). Therefore, the illusion of transparency when lying involves an estimate of how much concealed information is leaked out to others, whereby the illusion of transparency when truthful involves an estimate of how much others will believe the information conveyed. Additionally, when truthful, participants may simply expect to be believed as a result of a truth bias, which will be discussed in following sections.

In the realm of interrogations and deception detection, Kassin and Fong (1999) asked adult participants to predict whether an interrogator would be able to accurately judge them as guilty or innocent in an experimental context. Thirteen of their 16 suspects believed the interrogator would judge them correctly (78% and 86% of guilty and innocent suspects, respectively). These results demonstrated that mock suspects believed that interrogators would be able to accurately assess their guilt or innocence. Although this finding does not specifically examine the illusion among truth-tellers, it does provide some empirical support for the possible existence of the illusion of transparency in a forensic context.

Further support for the illusion among truth-tellers comes from research on strategies innocent suspects employ when interrogated. For instance, the innocent suspects in a study by Strömwall, Hartwig, and Granhag (2006) most frequently used a strategy of “telling it like it happened” to appear credible in their interrogations. This seems to reflect the belief that their innocence would be apparent to observers. Similarly, in their investigation of strategies employed by suspects during police interrogations, Hartwig, Granhag, and Strömwall (2007) gave participants ten minutes to strategize before their interrogations. When later asked to describe what strategies they had employed during their interrogations, more than half of the innocent suspects reported variations of telling the truth like it happened. That is, innocent

suspects did not report reliance on alternative strategies to make their stories sound credible because they were telling the truth. Another fifth of the innocent suspects reported intentionally using no strategy, in order to sound less rehearsed. Overall, 85% of the innocent suspects in this study reported that, during the interrogation, their basic strategy was to tell the truth about what occurred, clearly assuming that their truthfulness would be apparent to interrogators.

The illusion of transparency is also mentioned throughout the false confession literature as a possible reason that suspects waive their *Miranda* rights and speak with police officers. Kassin and Norwick (2004) experimentally investigated this phenomenon and found 58% of all participants were willing to sign a *Miranda* waiver. Analyses comparing the interaction between guilt condition and willingness to waive *Miranda* showed a dramatic difference in agreeing to waive *Miranda* rights between guilty (36%) and innocent (81%) suspects. Among the high percentage of innocent suspects (i.e., truth-tellers) who were willing to waive their right to silence in this study, over 72% mentioned an explanation that could be interpreted as a belief in the illusion of transparency (e.g., “I didn’t have anything to hide,” or “I did nothing wrong”) (Kassin & Norwick, 2004). Innocent people are more willing to waive their rights because they believe others will clearly recognize their truthfulness. Thus, the illusion of transparency may lead adults to talk to police investigators and face a possible minefield of dangerous police tactics to follow. The illusion of transparency may be also what is triggering guilty suspects to invoke their rights, afraid if they lied that it would be apparent. However, there is a paucity of empirical research about how children and adolescents would act in similar circumstances.

CHAPTER 3: ADOLESCENT MIRANDA WAIVERS AND FALSE CONFESSIONS

It is important to investigate the impact of the illusion of transparency on older children and teenagers for several reasons. In 2004, 2.4 million juveniles (aged 17 or younger) were arrested and 32% were aged 14 or younger. Many more juveniles interact with police but are not arrested (Snyder, 2002). These arrests usually begin with the questioning of suspects, before which the suspect must be made aware of their *Miranda* protections. However, even before a suspect is taken into custody and told of their *Miranda* rights, the police may begin a pre-interrogation interview. Structured as an information-gathering session, investigators may use this interview to determine the suspect's veracity based on verbal and non-verbal cues and behaviors (Kassin, 2005). Unfortunately, research has shown that even trained experts do not achieve high levels of accuracy in making judgments of truth or deception (Kassin & Fong, 1999), with accuracy rates typically at chance levels (Hartwig, Ganhag, Strömwall, & Vrij, 2004; Vrij, 2008). Nevertheless, if a suspect is deemed "deceptive," the interview transitions to an interrogation. This is the point during the investigative process at which a suspect may invoke his/her *Miranda* rights. However, the prevalence of an illusion of transparency may cause innocent suspects to waive these rights, placing them in a highly confrontational and psychologically coercive interrogation.

Though these procedures are potentially dangerous to any and all suspects, child and adolescent suspects are particularly at risk. Research shows that younger suspects often do not fully comprehend or know how to invoke their *Miranda* rights (Oberlander & Goldstein, 2001). A large body of research is dedicated to uncovering juveniles' understanding of *Miranda* and has consistently found that younger suspects frequently misunderstand some aspects of the *Miranda* warning (e.g., Redlich, Silverman & Steiner, 2003; Viljoen, Klaver, & Roesch, 2005). Youth is

clearly a risk factor in waiving *Miranda* due to a poor understanding of the warning, but even those juvenile suspects who grasp the factual meaning of *Miranda* warnings may still waive these protections for other reasons.

Studies have shown that adolescents under age 15 are more likely to believe they should waive their rights and talk with the police because they are taught to obey authority figures. Moreover, during this period of adolescence, self-consciousness is developing and increased self-consciousness has been associated with an increased likelihood of compliance and a greater susceptibility to coercion (Carver & Scheier, 1981; Deci & Ryan, 1985). In addition, they are more likely to base their decision on the immediate consequences (they can go home if they talk), rather than longer range consequences (Grisso et al., 2003). This may be related to differences in impulsivity. Research has demonstrated that adolescence is a period during which individuals are excessively prone to impulsive and risky behaviors (Chambers & Potenza, 2003). Abramovitch, Peterson-Badali and Rohan (1995) found that young adolescents were less likely to consider the seriousness of the charges or the amount of evidence against them when making hypothetical *Miranda* waiver decisions than older adolescents.

Though a *Miranda* waiver alone does not cause a confession, whether true or false, research shows that there is a relationship between *Miranda* comprehension and the likelihood of false confessions (Clare & Gudjonsson, 1995). Kassin (2005) posits that this relationship is related to naive thinking that one's actual innocence will be evident. It is possible that this naive belief, an applied manifestation of the illusion of transparency, exerts a strong impact on adolescent false confessions. As noted above, once an innocent suspect waives their *Miranda* rights, the interview transitions to an interrogation, at which point the interrogator's job changes from "fact-finder" to "confession-obtainer." The youth may then be subject to various coercive

techniques to elicit a confession. Clearly, from the perspective of an innocent suspect, the illusion of transparency can have vastly detrimental consequences because the transparency is simply an illusion, and innocence (or truthfulness) is not reliably visible to others.

It is possible that the illusion of transparency is exacerbated by the power differential between interrogator and juvenile suspect. For example, Garcia (2002) demonstrated that less powerful individuals felt more transparent and suffered from the illusion of transparency to a greater extent than people with more power. The assumption was that less powerful persons, who usually have more at stake during a negotiation or interrogation, will feel more nervous, vulnerable, and therefore more transparent. This power dynamic was demonstrated by Garcia (2002) in a workplace setting, but may also be applicable in a police interview/interrogation scenario, especially a scenario in which an adolescent suspect is interviewed or interrogated by an adult police officer, heightening adolescent vulnerability.

Adolescent False Confessions

There is little doubt that adolescents are more likely to confess under interrogation than adults. Kassin and Gudjonsson (2004) report that between 42% and 55% of suspects confess in an interrogation. Though there is no precise way to determine how many of the confessions are false, Drizin and Leo's (2004) examination of 125 proven false confession cases between 1971 and 2002 demonstrated that younger suspects are particularly at risk of falsely confessing. Sixty-three percent of the cases involved suspects under age 25, and juveniles, aged 17 or younger, made up a third of the cases. Kassin and Gudjonsson (2004) also report that false confession rates are particularly high among juveniles aged 12–16. Experimental research has obtained results similar to the qualitative research of Drizin and Leo (2004). Redlich and Goodman (2003) found that younger participants were more likely to sign a false confession than those who were

older: 78% of the twelve- to thirteen-year-olds signed a confession; 72% of fifteen- to sixteen-year-olds signed; and 59% of college students signed. Among the participants that were shown false evidence, 88% of the fifteen- to sixteen-year-olds signed a confession.

Adolescents have been shown to be more likely than adults to confess in a variety of contexts. This age-related difference has been shown in proven exoneration cases (Drizin & Leo, 2004; Gross et al., 2005), laboratory experiments (Redlich & Goodman, 2003), self-report studies (Gudjonsson, Sigurdsson, Sigfusdottir, & Young, 2012), and hypothetical vignettes (Goldstein, Condie, Kalbeitzer, Osman, & Geier, 2003). Though developmental differences in impulsivity, susceptibility to social influence, and relatively lower status may partially explain why adolescents would be more likely to confess than adults, the impact of the illusion of transparency has yet to be investigated. Increased feelings of transparency can create a situation in which innocent adolescents submit themselves to questioning, during which they must rely on the accuracy of interrogators' abilities to detect that they are being truthful—which is a dangerous proposition.

CHAPTER 4: DECEPTION DETECTION

As mentioned above, people generally perform at chance levels when making veracity judgments (Vrij, 2008). Among the many reasons why deception detectors perform poorly is that it is not just suspects who put faith in the illusion of transparency. The flip side of the illusion of transparency is that people generally assume that they will be able to tell when someone is lying to them, believing that the other person's deception will be transparent. This is known as *observer's illusion of transparency* (Takeda & Numazaki, 2004). However, decades of empirical research dispute the idea that people are accurate detectors of lies. Bond and DePaulo (2006) conducted a meta-analysis of 206 tests of detection accuracy (133 published) consisting of 6,651 messages sent by 4,435 senders and judged by 24,483 receivers. The result, across all of these cases, is an unweighted mean percentage correct of lie-truth classifications of 53.98% (Bond & DePaulo, 2006). This analysis also showed that people are generally better at detecting true statements (61%) than false statements (47%), demonstrating a truth bias, a tendency to regard others as honest. The truth bias was also clearly demonstrated by Vrij (2008) in his analysis of nine studies, finding that participants had a tendency to identify statements as truths (61.5% truth judgments), resulting in greater accuracy in detecting true (67% accuracy) than false statements (44% accuracy). Amidst the quantity of studies investigating lie detection accuracy, not only do researchers consistently find that lay people are poor at detecting deceit, they also demonstrate that presumed experts (police officers, federal agents, and psychiatrists) are mediocre lie detectors as well (Bond & DePaulo, 2006, Hartwig et al., 2004).

Detecting Children's Deceit

Overall, adults seem to believe that both their lies and truths are detectable by others (Hartwig et al., 2007), despite research consistently demonstrating that people are not skilled at

distinguishing truthful and deceptive statements (Vrij, 2008; Kassin & Norwich, 2004). The research on the accuracy of detecting children's veracity shows mixed results (e.g., Feldman, Jenkins, & Popoola, 1979; Vrij, Akehurst, Brown, & Mann, 2006). In a review of the studies that had adults make a dichotomous decision about veracity for statements made by children (aged 3–13), accuracy rates ranged from 49% to 66% (Vrij, 2008), indicating that detecting truths and lies among children is, at times, as difficult as detecting veracity in adults. Generally, studies have often shown that as children get older their lies are more effective and more difficult to detect (e.g., Feldman et al., 1979). However, other studies have revealed that adults are not very accurate at detecting children's deception. Jackson and Granhag (1997) found that adults' deception detection accuracy was at chance levels when children lied about a film they watched, and accuracy levels were at 59% in a study in which children lied about a trip to a museum (Westcott, Davies, & Clifford, 1991). These studies showed that adults were more accurate in detecting truths than lies, demonstrating a truth bias (Vrij, 2010). Yet, these results are not consistent throughout the literature. Edelstein, Luten, Ekman, and Goodman (2006) predicted that deception detection accuracy would be higher for children's statements than those made by adults. The results partially supported their hypothesis. Participants were significantly better at detecting children's versus adults' lies, but worse at accurately detecting children's truthful statements. Further analyses showed a bias; observers were more likely to judge statements by adults as truthful, but the truth bias was not present when evaluating the interviews of children. When both types of statements were combined (truths and lies), there was no difference in overall veracity detection accuracy between statements made by children and adults. The authors posit that the reason other studies have found that children's lies are easier to detect is because of the absence of the truth bias, not because of cues to children's deception. Crossman and Lewis

(2006) is a good example of this trend. Their study showed no difference in adults' ability to detect children's versus adults' veracity. This result stemmed from adults being particularly poor at identifying when children were telling the truth.

There have been only a few studies that have examined the ability of children to detect deception among other children, and the results of these studies are somewhat inconclusive. Two studies have found that children preformed at chance rates when detecting the deception of their peers (Feldman & White, 1980; Morency & Kraus, 1982). However, other studies have shown that children are able to accurately distinguish truths and lies among other children (Feldman, Devin-Sheehan, & Allen, 1978; Rotenberg, Simourd, & Moore, 1989). Talwar, Crossman, Gulmi, Renaud, and Williams (2009) more recently found that older children were better at distinguishing liars from truth tellers than both younger children and adults, however all participants preformed at relatively modest rates in this experiment. Talwar et al. (2009) posit that as children develop, they become more skillful at using inconsistencies between verbal and nonverbal behavior as cues to deception.

Though Feldman et al. (1979) found that seventh-grade and college student participants were more effective liars than first-graders; there is a clear paucity of research investigating deception detection among this middle age group, which is surprising because of the prevalence of adolescents as players in the legal system. The results of studies examining deception detection among children are mixed, but, in general, people are not particularly accurate at detecting deception among children or adults. However, we know much less about adolescent lie-telling. Survey research has reported that adolescents can be extremely effective lie-tellers (Knox, Zusman, McGinty, Gescheidler, 2001). Knox et al. (2001) found that only 5% of the adolescents surveyed reported that they were often caught when lying to their parents. It has also

been found that adolescents are able to successfully malingering during psychological assessments. Faust, Hart, Guilmette and Arkes (1998) demonstrated that adolescents (aged 15–17) were able to successfully lie and fake brain damage to trained professionals. None of the sixty-four neuropsychologists who participated were able to detect the adolescents' deception. However, a similar ability to successfully malingering was found in a sample of children 9- to 12- years old (Faust, Hart, Guilmette, 1998). Carmody and Crossman (2011) examined malingering among high school (aged 14–17) and college students (aged 18–22) and found that both samples were capable of successfully feigning emotional distress. The results of the studies on adolescent malingering demonstrate that it can be difficult to detect deception among adolescents.

Some of this difficulty in detecting deception may be due to a truth bias. It appears as though a truth bias exists when judging adults and not when judging children, however, research has yet to developmentally explore how the age of the suspect impacts the truth bias and if a truth bias exists among adolescents. Also, we do not know at what age children begin to lie with the same effectiveness as adults, although adolescents perform similar to adults in many situations and lie with increasing effectiveness across age (see Chapter 5). Relatedly, studies have yet to fully investigate age differences in the illusion of transparency and its development through middle childhood and adolescence. In order to understand the illusion of transparency developmentally, we must first examine how lie-telling skills develop.

CHAPTER 5: DEVELOPMENT OF LYING AND THE ILLUSION IN CHILDREN

Preschool age children, sometimes as early as two years old, will lie to others (Talwar, Crossman, Williams, & Muir, 2011). However, very young children tend to be poor liars (e.g., Lewis, Stanger, & Sullivan, 1989; Talwar, Murphy, & Lee, 2007). Their lies are usually simple and unsophisticated, often consisting of denials, with more elaborate lies falling short of being convincing (Polak & Harris, 1999; Talwar & Lee, 2002a). Their early lies are often transparent to observers. Younger children struggle in particular with controlling their verbal and nonverbal leakage when telling lies and as a result, they have difficulty not giving themselves away when attempting to maintain their lies (Talwar & Lee, 2002a). Feldman et al. (1979) demonstrated that adults were better at distinguishing between truthful and deceptive statements about a drink's taste by younger children (1st graders) than older children (7th graders) and adults. The authors state that this difference may be due to older children's ability to present themselves as more honest-looking by controlling their facial expressions. There is evidence that children become more effective liars, and therefore, less transparent, as they develop.

Younger children have a less complete appreciation of how to lie effectively, partly as a result of their lack of understanding of the mental states of others. Indeed, very young children are thought to have an egocentric viewpoint from which they expect their thoughts to be shared and known by others (Flavell, 2000). As children develop, they gain a better understanding of the mental states of others and their evolving understanding is reflected in research examining lie-telling and *Theory of Mind* development. In order to lie effectively, one needs to instill a false belief in the mind of a receiver. This requires children to approach the interaction from the perspective of the other, a skill that is often lacking in young children (Broomfield, Robinson, & Robinson, 2002). Therefore, children's false belief understanding may relate to their lie-telling

ability (Chandler, Fritz, & Hala, 1989; Polak & Harris, 1999; Talwar & Lee, 2002a). Indeed, lie-telling has been identified as an indicator of a child's concept of false belief (Chandler et al., 1989; Peskin, 1992; Ruffman, Olson, Ash, & Keenan, 1993). Polak and Harris (1999) found that 3- and 5-year-olds' false belief understanding was related to their false denials of wrongdoing. Yet, there is a difference between being able to deny a transgression and being able to sustain a more elaborate lie, which requires a specific assessment of the situation and of what should and should not be revealed (Polak & Harris, 1999). Generally, as theory of mind develops, elementary school aged children are better able to maintain their lies than their younger preschool counterparts (Talwar & Lee, 2002a; Talwar, Gordon, & Lee, 2007).

Besides false belief understanding, other skills are required to be an effective liar, many of which are related to executive functioning. Executive function is a general term that encompasses numerous cognitive skills that develop through childhood including: inhibitory control, self-regulation, planning, and strategy employment (Welsh, Pennington, & Groisser, 1991; Zelazo, Carter, Reznick, & Frye, 1997). Inhibitory control and planning have been directly related to children's deception (Carlson & Moses, 2001; Carlson, Moses, & Hix, 2006). Planning skill is necessary in order to maintain a lie. A child must prepare a convincing story before reporting it (Talwar & Crossman, 2011). Inhibitory control is the ability to suppress thoughts or actions and, when lying, children have to suppress information they want to conceal. Inhibitory control is likely related to ability to suppress true facial expressions and emotions while replacing them with more socially appropriate ones to lie effectively. Younger children also have less of an understanding of the mental states of others and may display more nervousness and greater cognitive effort than older children when lying because they are not suppressing these cues like older children would (Vrij, Akehurst, Brown, & Mann, 2006).

For example, research has shown observable differences in facial expressions between younger and older children when lying. Saarni (1984) found that older children (age 9) displayed more positive expressions when trying to conceal their true feelings upon receiving a gift that they did not like, reflecting their better understanding of cultural display rules. Ekman, Roper, and Hager (1980) studied deception among 5-, 9-, and 13-year-olds and found that older children have an improved ability to intentionally produce the component actions involved in facial expression, suggesting that with increased age, fewer cues to deceit are likely to occur. This is likely a reflection of their better developed executive abilities, particularly inhibitory control (Talwar & Crossman, 2012).

Additionally, younger children often have difficulty with impression management. McCarthy and Lee (2009) examined eye gaze as a potential marker of deception because it is often relied upon as a stereotypical indicator of lying—individuals are expected to break eye contact when lying. Adults, experienced with impression management, try to maintain eye contact when deceptive to appear honest. However, if children are not familiar with this belief, they may be more likely to break eye contact. Indeed, the study found a developmental trend: older children did not break eye contact when lying as much as the younger children. Thus, older children had a better understanding of how to exhibit nonverbal behavior when lying in order to conceal their deception (McCarthy & Lee, 2009), making them more effective liars. Therefore, older children, who better understand the mental processes of others, have more fully developed executive control and understanding of display rule use, will be able to control facial expressions, maintain eye contact, and suppress signs of nervousness and effort more effectively than younger children. This should allow them to appear less transparent than younger children to observers or deception detectors.

Deception among Adolescents

Though much research has been dedicated to understanding lying among younger children and adults, there has been less focus on how lying behaviors develop through late childhood and adolescence. Although studies have examined the actual lying behaviors among adolescents, the data collected was primarily self-reports from the adolescents themselves or reports from teachers and parents (Darling, Cumsille, Caldwell, & Dowdy, 2006; DePaulo, Kashy, Kirkendol, Wyer, & Epstein, 1996; Stouthamer-Loeber & Loeber, 1986). Self-reports may underreport lies, providing, at best, indirect measures of the inclination to lie, due to the negative views associated with deception (Evans & Lee, 2011). Though self-report studies have provided information about the frequency of adolescents' lying and about the types of lies they tell, these types of studies fail to reveal the sophistication of adolescents' ability to lie and if these abilities continue to develop through adolescence (Evans & Lee, 2011).

A few studies to date have attempted to investigate how lying behaviors develop. For instance, Talwar, Gordon and Lee (2007) investigated the lie-telling behaviors of participants, cross-sectionally, from childhood to early adolescence. In this study, 6- to 11- year olds were placed in a temptation-resistance paradigm where they were left alone in a room and asked not to peek at the answer to a test question. Though hidden cameras recorded that half of the children peeked at the answer, when asked about peeking, almost all of those who peeked lied and denied peeking. In order to determine participants' skill at maintaining their lie, researchers asked two follow-up questions about irrelevant details on the back of the card that only someone who peeked would know. Though there was no age-related difference in lie-telling rates, older children had a better understanding of what is necessary to be effective at maintaining their lie; that they should feign ignorance of the details on the back of the card. As age increased,

participants were more successful at concealing their transgression and maintaining the lie. Similarly, Feldman et al. (1979) found that college-age students and seventh-graders were both more successful at feigning their enjoyment of an unpleasant drink than first-graders. Naïve observers were able to accurately determine when first-graders were being deceptive based on their nonverbal behaviors, but could not accurately decode the veracity of the seventh-grade or college student samples

Evans and Lee (2011) investigated the development of deception among 8- to 16-year-olds, using a similar modified temptation-resistance paradigm as mentioned above. The results showed an age-related decrease in lying, which may stem from a more advanced moral understanding of lying with age, leading older participants to confess their transgression (Lee & Ross, 1997) or from a more advanced awareness of the difficulty of deceiving their adult target. Older children may have told the truth to avoid being caught in a lie. Though not mentioned in the study, it is possible that an illusion of transparency is what motivated older participants to be truthful, afraid that their lies would be obvious to others and, thus, detected by the adult experimenter. Evans and Lee (2011) did not find differences in lie sophistication (assessed in terms of maintenance) as a function of the age of the participants, but they did report individual differences in two factors positively related to lie sophistication: working memory and planning skill. The authors also noted a relationship between adolescent lying and delinquency, which may be mediated by executive functioning. Deficits in executive functioning hinder the ability to create statements sophisticated enough to conceal their transgressions, resulting in high levels of deception detection and an increased likelihood of involvement in the criminal justice system.

Consistent with these findings, cognitive skills, such as working memory and inhibitory control are also developing through late childhood and adolescence, and these skills have been

shown to impact younger participants' abilities to maintain their lies (Evans & Lee, 2011). This suggests that children develop both the cognitive ability and the understanding of how to lie effectively as they age, perhaps explaining, in part, why older children lie more effectively than younger children (Talwar & Lee, 2002a). Ekman, Roper and Hagar (1980) describe how the ability to control facial expression increases with age and how older adolescents are as capable as adults at controlling their facial expression. Lee and Ross (1997) also report that as age increases, adolescents' conception of lying becomes more nuanced. As a result, as children become better liars, their lies should be more difficult to detect. This should, then, increase the illusion of transparency because, although they may still feel transparent, their lies become less transparent—making transparency an illusion for adolescents, rather than the reality it might be for children.

A previous study examining the illusion of transparency among 6- to 11-year-olds and college students (Mandelbaum et al., 2014), found that younger children did not exhibit the illusion of transparency for one simple reason—they were actually transparent. Their predictions were consistent with their actual credibility; younger children expected that their truths would be believed and that their lies would be detected and, overall, experimenters were able to correctly identify their truths and lies at rates higher than chance. However, some developmental differences were observed. Older children, in contrast to younger children, both anticipated and delivered less transparency. It was clear that children became more effective liars as they aged, as it was more difficult for observers to detect deception among older children. Among the oldest children (10- to 11-year-olds), experimenters were only able to identify truths and lies at levels close to chance, providing evidence that the illusion might emerge during middle-childhood, as children's lie-telling abilities improve and lies become less transparent.

As suggested above, the ability to lie effectively involves the ability to present a convincing verbal and nonverbal statement, which means that a verbally false statement needs to be accompanied by nonverbal behavior that will not disclose the lying. Lying well is primarily a form of effective self-presentation. Self-presentation is the way people adjust, monitor, and plan their behavior in order to be perceived well by other people and project a better self-image (Banerjee, 2002a). Banerjee (2002b) showed that self-presentation behaviors appear in children from the age of 8 years and older. This emerging concern with self-presentation is likely related to the illusion of transparency as well. As children begin to experience heightened awareness of their own self-presentation, they seem also to become more self-conscious (Banerjee, 2002c). Given their heightened attentiveness to themselves and how they are perceived, older children might also become more attentive to whether or not others can “see” their highly salient internal states. This might lead them to expect more belief from others when honest and more suspicion from others when they are lying. Younger children, on the other hand, who are less aware of their own self-presentation, and have less developed self-consciousness, might consequently be less likely to show an illusion of transparency. Therefore, it is necessary to examine the development of self-consciousness and self-awareness to investigate their relationship with the illusion of transparency.

CHAPTER 6: SELF-CONSCIOUSNESS AND SELF-AWARENESS

Individuals might expect different levels of their own transparency, depending on self-consciousness and/or self-awareness. Self-consciousness is a term used to describe heightened attention to the self, encompassing both interior and exterior aspects (Davis & Franzoli, 1999). These two aspects are often identified as *Public self-consciousness* (PuSC) and *Private self-consciousness* (PvSC). PuSC is described as an awareness of the aspects of the self that are visible to others, such as actions, speech, and appearance, whereas PvSC is a focus on the aspects of the self that are hidden from others, such as thoughts, worries, and attitudes (Davis & Franzoli, 1999). People high in PuSC are often concerned about how they are perceived by others and may be more susceptible to conformity and loss of autonomy (Carver & Scheier, 1981; Plant & Ryan, 1985), whereas those with high levels of PvSC have heightened awareness of internal sensations (Scheier, Carver, & Gibbons, 1979) and show high correlations between their attitudes and behaviors (Scheier, Buss, & Buss, 1978). Wiekens and Stapel (2010) showed that public and private self-consciousness are not independent, but rather correlated ($r = 0.30, p = 0.01$). In general, people with high levels of public self-consciousness also tend to be high in private self-consciousness.

The degree to which one focuses on him/herself can be a dispositional or situational characteristic. Self-consciousness is often used to represent dispositional self-focus, whereas situational self-focus is often labeled “self-awareness” (Fenigstein et al., 1975). Generally, private and public self-consciousness are thought to be stable aspects of an individual’s personality (Buss & Scheier, 1976; Carver & Glass, 1976), whereas self-awareness is a more transient state susceptible to manipulation. For example, when participants are asked to focus on their personal thoughts and feelings private self-awareness can be activated (e.g., Webb, Marsh,

Schneiderman, & Davis, 1989, Study 3). Self-awareness is often induced in laboratory studies by exposing participants to a video camera and suggesting they will be recorded (e.g., Plant & Ryan, 1985).

Why Self-Consciousness May Impact Feelings of Transparency

Researchers have identified two mechanisms by which people's feelings of transparency may be enhanced by dispositional self-consciousness and situational self-awareness. The two mechanisms work together to increase transparent feelings. The first is an individual's interpretation of their own behavior and the second is imagining how an outside observer would perceive that behavior. Self-awareness theory postulates that when people are self-focused, they tend to direct their attention to their thoughts and feelings, personal history, their body, and other aspects of themselves (Duval & Wicklund, 1972). Research by Turner (1978, 1980) verifies that individuals who are high in dispositional self-consciousness find it easier to access self-referent information. The increased accessibility of self-knowledge impacts one's interpretation of one's own behavior; the greater the salience of self-relevant information, the greater the impact on personal judgments of one's own actions and statements. Much like the research on how priming can influence judgments of another's ambiguous behaviors (see Higgins, 1989), when people are self-aware, they have a propensity to see their own actions as conveying information consistent with their personal attributes and attitudes. Observers, who do not have access to the individual's self-beliefs, may interpret behaviors or remarks differently. However, people generally assume that the judgments made by others will be somewhat congruent with their own (Marks & Miller, 1987), which may lead to poor estimates of an audience's impressions. When one sees more of themselves in their own behavior, they may expect others to see this as well, which, in turn, may translate into greater feelings of transparency. Self-aware individuals may feel more of the

illusion of transparency because they are more likely to see themselves in their behaviors in the presence of salient self-relevant information, but observers will not. In terms of the anchoring and adjustment model presented by Gilovich et al. (1998), individuals that are more aware of their internal states begin the process from a more pronounced anchor, which results in greater feelings of transparency.

The act of perspective taking is a second mechanism through which the illusion of transparency may be increased as a function of self-awareness. Through this act, individuals must estimate whether another's perception of their behavior will coincide with their own. In order to make an accurate estimation, an individual must take the point of view of the observer. This mental feat is well captured in a description of *perspective suppression*, which focuses on attempting to abandon one's own personal perspective (Hodges & Wegner, 1997). The task of suppressing one's own perspective is an inherently difficult task, which is even more challenging when individuals are self-aware because of the direct relationship between the salience of self-knowledge and self-awareness. When one's own perspective is readily accessible, appreciation of alternate points of view is more difficult. This idea is supported by research by Higgins (1981) which speculates that perspective-taking varies in difficulty depending on the degree to which "competing information relating to one's own characteristics and viewpoint is accessible and salient" (p. 129), as well as research that links egocentric cognition with self-focused attention (e.g., Fenigstein, 1984; Fenigstein & Vanable, 1992). Research also demonstrates that individuals who are more self-aware are more likely to show evidence of a *false-consensus effect*, by assuming that the attitudes of others are congruent with their own preferences (Fenigstein & Abrams, 1993). Thus, the second mechanism by which self-awareness is hypothesized to increase the illusion of transparency revolves around judgmental biases in

perspective-taking. Most likely, both mechanisms (behavior interpretation and perspective-taking) heighten feelings of transparency, but may be related to different aspects of self-consciousness (private and public).

Self-Consciousness Development

Research to date suggests that concerns about self-presentation change over the course of development. The private and public subscales of the Self-Consciousness Scale (SCS) (Fenigstein et al., 1975) are used to quantify the stable traits of public and private self-consciousness. Though this scale was originally validated with college student populations, a revised version for use with general populations has simplified the language, while maintaining high internal consistency and stability over time (Scheier & Carver, 1985). Abrams (1988) examined the use of the Self-Consciousness Scale among adolescents using exploratory factor analysis and found that there is less distinction between PuSC and PvSC among 10- to 13-year-olds. Also, among the younger participants (10- to 11-year-olds), PvSC was a better defined factor. PuSC began to clearly emerge as a factor among 12- to 13-year-olds. The author postulates a shift from egocentric to socialized self-awareness during this stage of development. That is, very young children have egocentric self-awareness because they are less able to conceptualize or take into account the perspective of another—their own states are more salient—and they do not consider how they are perceived by others. As children develop, they begin attaching increased importance to how they are perceived by others (Tice, Buder, & Baumeister, 1985). Self-consciousness has been associated with concern for appearance (Solomon & Schopler, 1982), the use of makeup among women (Miller & Cox, 1982), as well as tendencies to be compliant and susceptibility to coercion (Carver & Scheier, 1981; Deci & Ryan, 1985).

Adolescence is a period during which individuals become more self-conscious because they grow more concerned about how they are perceived by others. One conceptualization of the developmental change in self-consciousness during adolescence is that it is a normal response to increasing concerns related to social acceptance, during a developmental period in which social aspects of the self are highly salient (Hart, Fegley, Chan, Mulvey, & Fischer, 1993). During adolescence, peer relationships become more important as children spend more time with others, outside of the family (Larson & Richards, 1991). It is also a period during which school transitions bring adolescents into contact with greater numbers of unfamiliar peers and new possibilities for romantic relationships. Adolescents are often characterized as: preoccupied with their appearance, highly susceptible to peer pressure, easily embarrassed, and more likely to engage in self-reflection and self-scrutiny (Rankin, Lane, Gibbons, & Gerrard, 2004). According to this conceptualization, the increase in self-consciousness is stimulated environmentally and, after a marked increase during adolescence, should diminish after the numerous transitions during this developmental period (Rankin et al., 2004).

This conceptualization is supported by empirical research. For example, a longitudinal study investigating the development of self-consciousness found no significant changes in self-consciousness between grades 9–12 (Davis & Franzoli, 1999) demonstrating that by high school, self-consciousness is a stable trait. However, cross-sectional research among younger adolescents has found age differences on the Imaginary Audience Scale (IAS; Elkind & Bowen, 1979), which is often used as a measure of self-consciousness (Cohn et al., 1988; Lapsley & Murphy, 1985). Elkind and Bowen (1979) found IAS scores highest among eighth graders, demonstrating an increase in self-consciousness during middle adolescence. Additionally, Garber, Weiss, and Shanley (1993) found, among 12- to 15-year-olds, that the closer the

participants were to 15, the higher they scored on three different measures related to self-consciousness (the IAS; the Self-Consciousness Scale developed by Fenigstein et al., 1975; and the Imaginary Audience and Self-Focused attention subscales of the Adolescent Egocentrism Scale developed by Enright, Lapsley, & Shukla, 1979). Rankin et al. (2004) studied self-consciousness longitudinally among two cohorts (initially 13- and 15-year-olds) over four years and found that private self-consciousness increased while public self-consciousness began to decrease as the participants aged. This study found a curvilinear age decline in PuSC similar to other studies (e.g., Elkind & Bowen, 1979), whereby PuSC peaks and then declines during adolescent development.

It appears, then, that both public and private self-consciousness develop through late childhood and adolescence, with public self-consciousness peaking in early adolescence. These aspects of self-consciousness are independent, but not necessarily exclusive, types of attentional focus with important cognitive, affective, and behavioral implications (Plant & Ryan, 1985) and have been demonstrated to be relatively stable dispositional characteristics among adults (Fenigstein, 1975).

Self-Consciousness and Feelings of Transparency

Vorauer and Ross (1999) conducted a series of studies in which different types of self-focus were directly related to the illusion of transparency among adults. The first study looked at the relationship between feelings of transparency and dispositional self-consciousness. In this study, 51 undergraduates completed an SCS and then responded to three personal relationship problems. Each problem had four possible solutions, but three of them were clearly unreasonable. To assess transparency, participants completed a checklist task asking whether or not another person would be able to judge them accurately on 30 trait characteristics, which

varied on observability, based on their answers to the problems. There was a significant relationship between public self-consciousness and feelings of transparency for highly observable traits, and a significant relationship between private self-consciousness and transparency for traits that were less observable. In this study, highly self-conscious participants thought that another person could accurately determine their traits more often than individuals lower in self-consciousness (Vorauer and Ross, 1999, Experiment 1).

As mentioned earlier, Gilovich and colleagues (1998, study 1c) also examined the relationship between the self-consciousness subscales and feelings of transparency. The authors hypothesized that it is the difficulty in putting aside one's own phenomenological experience when taking another's perspective that gives rise to the illusion of transparency. Therefore, when estimates of transparency are based on one's own phenomenological experience, participants for whom their internal states are more readily available should feel as though their internal states are more transparent to observers. To test this theory, the authors included the Self-Consciousness Scale (Fenigstein et al., 1975), predicting that the private self-consciousness subscale would be most related to the illusion of transparency. Since this scale measures internal focus, participants high in private self-consciousness would be more aware of their internal states and more likely to believe that these states leak out. To test this theory, the authors correlated self-consciousness scores with feelings of transparency and detectability estimates. Neither public self-consciousness, nor social anxiety were significantly related to participants' transparency estimates or perceived detectability in this study. However, scores on the private self-consciousness subscale were significantly correlated with both feelings of transparency ($r = 0.41, p < 0.01$) and lie detectability ($r = 0.40, p < 0.02$). The authors posit that this relationship stems from a habitual focus on one's own thoughts and feelings among those high in private self-

consciousness (Gilovich et al., 1998) which impacts the starting point for the anchoring and adjusting processes.

Additionally, research shows that environmental stimuli can impact the awareness of aspects of the self. Self-awareness has been situationally induced by various experimental manipulations (Carver & Scheier, 1981). For example, awareness of public aspects of the self may be induced with stimuli that suggest that one will be observed by others, such as video cameras, audio recordings, or audience presence (Plant & Ryan, 1985). In Plant and Ryan's study, the authors successfully used the presence or absence of a video camera to manipulate public self-awareness, by telling some participants that their behaviors were being recorded for subsequent analysis. Hass (1984) also used a video camera to manipulate self-awareness. In this study, participants were asked to draw an "E" on their foreheads, and those participants in the high self-focus (video recording) condition were much more likely (55%) to draw the "E" so it was properly oriented for an observer to read, compared to the low self-focus condition (18%). The results were replicated in a second study in which the camera was placed behind the participants (participants' faces could not be recorded during the task), demonstrating that it is the perception of being observed, not the actual observation, that impacts situational self-awareness. The theory behind these differences is that when people believe they are being recorded, there is an increase in public self-awareness which, in turn, causes them to adopt an external vantage point and view themselves from another person's perspective (Hass, 1984).

In their second study, Vorauer and Ross (1999, Experiment 2) explored how states of self-awareness, as opposed to individual differences in self-consciousness, impact feelings of transparency. Once again, participants completed the personal relationship problem task as in study one and responded to a checklist task asking whether or not another person would be able

to judge them accurately on 30 trait characteristics, which varied on observability, based on their answers to the problems. Half of the participants first indicated their feelings of transparency (no prime condition) and the other half made self-ratings of their traits immediately before indicating how well observers would be able to assess them on each dimension from their answers to the relationship problems (prime condition). Observers then received one participant's answers and were asked to rate the impressions formed of the participant. Results indicated that the participants strongly overestimated their transparency. The participants who were led to focus on their traits before making transparency judgments stated that more of the traits would be identifiable to observers than those participants in the no prime condition. Though participants in both conditions demonstrated an illusion of transparency, those who focused on their traits first felt that 73% of these traits would be identifiable (Vorauer & Ross, 1999, Experiment 2)

Study 3 looked at participants' views of transparency in an evaluative context that promoted self-awareness. The authors manipulated the degree to which participants thought they were being evaluated by their partners. Participants in the more evaluative condition felt more transparent than participants in the low evaluative condition (Vorauer & Ross, 1999, experiment 3). Overall, the results of this series of studies demonstrated that self-consciousness and self-awareness are positively related to feelings of transparency. The authors concluded that participants with higher levels of self-consciousness thought that others could determine their personality better and faster than participants with low self-consciousness, indicating a relationship between self-consciousness/self-awareness and feelings of transparency. The current series of studies explored whether these results replicated —with a particularly strong relationship anticipated among older children and adolescents, who typically experience

developmentally-heightened self-consciousness. Moreover, if self-consciousness was related to feelings of transparency, then it was expected to be related to the illusion of transparency as well.

CHAPTER 7: QUESTION FRAMING

Finally, question framing may influence predictions of transparency and thus the illusion. Illusion of transparency studies in which participants were asked to detect lies found an illusion among liars (e.g., Gilovich et al., 1998), but have not found the illusion among truth-tellers. In our previous study (Mandelbaum et al., 2014), we found that asking undergraduates whether others will *believe* their statements resulted in high predicted rates of credibility both when honest and when lying. In that study, the illusion of transparency was absent among liars who responded with high percentages when asked how many others would *believe* them. Overall, we speculated that the salience of the mental state mentioned in the question impacts predictions of transparency. By asking people *how believable* they were, the participants inflated their predictions of believability for both liars (reduced expected transparency) and truth-tellers (increased expected transparency). Therefore, we examined the degree to which question framing impacts participants' feelings of transparency by manipulating how participants are asked to indicate their feelings of transparency.

The term “framing effect” refers to the finding that participants' choices are impacted by how a scenario is described or framed (Tversky & Kahneman, 1981). In their classic study on how framing impacts decision-making, Tversky and Kahneman (1981) presented a series of demonstrations in which participants shifted their preference due to seemingly inconsequential changes in the way the problem was described. For example, participants were presented with two programs to battle an imaginary disease threatening to kill 600 people. The first one could save 200 of the 600 lives, while the other had a 1/3 probability of saving all 600, but a 2/3 probability of saving no one. When described in a positive way (number of lives saved), participants preferred the first, less risky option. Yet, when reframed and described in terms of

lives lost, a majority of respondents switched to the second, riskier program. Similarly, Levin (1987) had participants evaluate a hypothetical purchase of ground beef that was described as “75% lean” for one group and “25% fat” for the other group. Even though these descriptions are equivalent (75% lean ground beef is 25% fat), Levin found that the first group believed their beef was of a higher quality and would taste better than the second group. Correspondingly, when medical treatments were framed in terms of survival versus mortality rates (McNeil, Pauker, Sox, & Tversky, 1982) or when research and development teams were described in terms of their rates of success versus failure (Duchon, Dunegan, & Barton, 1989), positive descriptions triggered higher rates of positive responses. Clearly, how a question is framed can exert influence on an individual’s decision making. A meta-analysis by Kuhberger (1998) demonstrated that the overall framing effect between conditions is of small to moderate size, based on a data pool of 136 empirical papers that reported framing experiments with nearly 30,000 participants. In the proposed study, we will explore how framing influences participants’ predictions of their own credibility. It is possible that predictions regarding the number of *people who will believe you are telling the truth* would trigger different judgments than asking *how many people will think you are lying*.

In an experiment investigating the reasons behind framing effects, Frisch (1993) tried to understand participants’ reasoning for their different treatment of equivalent problems. Many participants justified their choices in Frisch’s study by arguing that the two problems, though formally equivalent, had different emotional consequences. Perhaps this explanation would generalize to the transparency context. The emotional consequence of being caught in a lie may differentially impact predictions depending on how the prediction question is framed due to the negative feelings and thoughts associated with lying.

Positive vs. Negative

Research demonstrates that people spend more time thinking and reasoning about bad events than good ones (Baumeister et al., 2001). In a review of 17 studies investigating causal attributions (Weiner, 1985), it was shown that, in all studies that contrasted positive and negative events, participants engaged in more effortful processing to explain what was occurring during an event and what caused the event when the event was negative. Additionally, Pratto and John (1991) used a modified Stroop paradigm, presenting positive and negative traits in different colors and asked participants to identify the ink color, in order to test how the word meaning impacted attention. The authors found that people took longer to identify colors paired with negative traits, compared to positive traits, concluding that bad traits attracted more attention than good. Hamilton and Huffman (1971) studied impression formation and found that undesirable traits impact impressions more than desirable ones. An explanation posited for their finding was that since good behaviors are more common and expected, bad traits are more revealing and more important to know. Skowronski and Carlston (1992) explained that bad traits are more diagnostic than good because to be morally good one must be good all the time, whereas immorality does not require consistency, just a single immoral behavior. Their example was that one may be regarded as a liar despite mostly telling the truth, but one will not be seen as honest if he/she lies. Their findings demonstrated a negativity bias when evaluating the impact of moral traits (e.g., dishonesty) on impression formation. Overall, the stronger power of bad versus good information in forming impressions has been consistently demonstrated. Wright (1991), coming from a background in perception, proposed a “fundamental negative bias” (p. 471) in which negative events guide perception more than positive ones and that this negativity carries over into thoughts and feelings following the initial perception. Also, these effects are strongest

when the stimuli are salient and the context is vague. The salience of the stimuli may lead to a possible interaction as a function of congruence. Thus, when a participant is truthful, more transparency may be felt when asked, “How many other participants will think you are telling the truth?” but less transparency when lying and asked the same question. On the other hand, when asked, “How many observers think you’re lying?” we may see an increase in feelings of transparency among liars, but not truth-tellers.

Overview of the Present Research

Research on the frequency at which innocent suspects waive their *Miranda* rights and subject themselves to police interviews has been linked to an illusion of transparency among truth-tellers. An illusion of transparency has been shown to exist in a variety of contexts, and among liars; however, the illusion of transparency has yet to be empirically studied when telling the truth. This series of three studies explored feelings of transparency when lying and when truthful among participants at various stages of development. Children and adolescents participated in order to investigate the illusion of transparency developmentally because of the high prevalence of adolescents in the criminal justice system and the disproportionate rate at which adolescents waive their *Miranda* rights. During late childhood and early adolescence children are developing in two distinct ways that may influence an illusion of transparency. First, their lie-telling skills are improving, making their lies less detectable. Second, their self-consciousness is emerging and developing. Research has demonstrated that self-consciousness develops through late childhood, peaking in early adolescence, and that a strong relationship exists between both dispositional self-consciousness and situational self-awareness and feelings of transparency.

To examine the strength and prevalence of an illusion of transparency, participants' feelings of transparency were compared to the detectability of the veracity of their statements made (actual transparency). In addition, these studies explored how framing the prediction question can impact participants' predictions of their transparency because framing may provide an explanation for why the illusion of transparency has been seen among liars and not truth-tellers.

CHAPTER 8: STUDY 1

Since the illusion of transparency has not been studied among older children and adolescents, creating a means by which to assess it was a major focus of the first study. Studying the illusion of transparency among children and adolescents can help illuminate the mechanisms underlying the development and evolution of deception, and may offer insight into juvenile *Miranda* waivers and the undeniable prevalence of juvenile false confessions. It is unclear at what point in development an illusion of transparency appears, but it is possible that the illusion emerges in response to children's early, unsuccessful lie-telling efforts in which they are often transparent and detectable. The existence (or emergence) of the illusion could influence children's lie-telling, driving children's evolving efforts to overcome their actual transparency as well as their transparent feelings by improving their lie-telling skills. The current study is a first step toward clarifying the interaction between lying/truth-telling and the illusion among children and teenagers. Besides our previous study of 6- to 11-year-olds, other studies that have researched the illusion of transparency have only examined adult participants; therefore, a primary purpose of this study is to explore the development of the factors that create an illusion of transparency in children and adolescents and to compare these findings to a sample of adults (Study 2).

Understanding the illusion phenomenon developmentally may contribute greatly to the understanding of adolescents' lie-telling abilities and behaviors. Children begin to lie early and their lie-telling abilities improve with age (Talwar, Crossman, Williams, & Muir, 2011). Hence, older children and adolescents likely know more about the mechanics of lies and have greater awareness of potential cues to their lies than younger children. As they gain this knowledge, it is possible that the illusion of transparency develops as well. Though children still feel transparent,

their newfound abilities that develop through adolescence make detection more difficult. Thus children should be more transparent (i.e., lies and truths more readily detected) than adolescents and adults. At around the same age as lie-telling abilities improve (late childhood and early adolescence), self-consciousness is emerging and developing, increasing both individuals' self-focus on internal experiences and their concern about how they are perceived by others. Self-consciousness, which may play an important role in the development of the illusion of transparency, and possibly explain individual differences in feelings of transparency, appears to peak during adolescence. Therefore, adolescents' improved lie-telling ability, along with increased self-consciousness, may make adolescents particularly prone to the illusion of transparency. It was thus hypothesized for Study 1 that:

- (1) An illusion of transparency (the tendency to believe one's internal state is more visible to others than it actually is) would be observed both when participants lied and when they told the truth.
- (2) The illusion of transparency would be seen at higher rates among adolescents than in younger children, for both truthful and deceptive statements.
- (3) Teenagers would have a better understanding of how to lie effectively, demonstrated by a reduced detectability of their deceptive statements when compared to younger participants. Younger participants would show greater levels of actual transparency.
- (4) Participants would feel more transparent when situationally publicly self-aware (told that a camera is on and recording their statements) than when not made self-aware (told the camera is off and not recording) and greater levels of the illusion of transparency would be observed when participants believed they were being video recorded.

(5) Participants with higher trait self-consciousness scores would feel more transparent when lying and telling the truth than participants with lower levels of self-consciousness. The study explored potential relationships between the private, public, and social anxiety subscales of the Self-Consciousness Scale and the illusion of transparency, but it was predicted that all would increase the illusion of transparency.

(6) When the question was framed as, “How many of the other players will believe you are telling the truth?” we would see an increase in predictions of transparency among truth-tellers; when it was framed as, “How many will think you're lying?” we would see an increase in predictions of transparency among liars. Therefore, a veracity by framing interaction was predicted.

Method

Participants

Participants were 34² children and teenagers between the ages of 9 and 17 years (18 males; $M_{\text{age}} = 11.8$ years, $SD = 2.45$). Participants were from diverse backgrounds, including 12 Anglo-American, 11 African-American, and 5 Hispanic-American children, as well as 6 children from mixed/multiple backgrounds. To study the illusion of transparency developmentally, we sampled participants at various ages, with middle childhood through adolescence chosen because self-consciousness appears to emerge during the middle elementary school years and continues through adolescence. In an effort to recruit similar numbers of participants at each age, data was collected at an elementary school ($n = 17$; 11 males), a middle school ($n = 10$; 4 males), and an after school program for high school students ($n = 7$; 3 males). For all child and adolescent

²A power analysis using G*Power indicated statistical power of 0.96 for the sample of $n = 34$, for medium effect sizes, $\alpha = .05$ and $d = .5$, consistent with previously reported main effects. A sample size of $n = 120$ would be required to detect $d = 0.25$ effects, consistent with previously reported interaction effects. Data should be interpreted accordingly.

participants, parental consent and child assent were obtained prior to participation. Participants were compensated for their participation with small prizes (pencils, erasers).

Design

The design is a 2(statement veracity: lie, truth) X 2(self-awareness induction: video on, off) X 2(post-statement framing: believe truth or detect lie) mixed factorial design in which veracity and self-awareness induction are within-subject variables and post-statement framing is a between-subjects variable.

Materials

Life Event Inventory. All participants initially answered the *Life Event Inventory* questionnaire on paper (see Appendix A). This scale was designed for a study investigating children's prepared and unprepared lies among a sample of participants in Gothenburg, Sweden (Strömwall, Granhag, & Landström, 2007). According to the authors, the objective of this scale is to include age-appropriate events that children of this age group could have experienced and that would be emotional, so the events would be remembered well. Our slightly modified versions (three items were deleted because they did not translate well into American English) contains 9 items, to be answered with either "yes" or "no". Four different forms of this questionnaire were employed, with items randomly rearranged to create four versions to ensure variation in which events participants described (see below).

Illusion of Transparency. For the illusion of transparency assessment, questions that correspond to events on the *Life Event Inventory* were printed in individual index cards. Each card had one scenario/life event to describe (e.g., "Do you remember an occasion when you were stung by a bee?"). Every life event appeared four times—two cards included a smiling face (indicating that the participant should be truthful) and the other cards included a winking face

(indicating that the participant should trick the other players and lie, but appear truthful). One card in each of the veracity conditions also indicated that the statement would be videotaped and the other card in each condition stated that the statement would not be video recorded. These were used in the illusion procedures described below. To record participants' predictions and to manipulate the framing of the prediction question, 2 versions of a speaker sheet were created (see Appendices C & D). The other players recorded their veracity decisions for each statement made by the speaker on an observer sheet (see Appendix B).

Self-Consciousness Questionnaire. This scale is a slightly modified version of Scheier and Carver's (1985) Self-Consciousness Scale for use with general populations. The 22-item scale is divided into three subscales: private self-consciousness, public self-consciousness, and social anxiety. The questionnaire uses a 0–3 rating scale, (3 = a lot like me, 2 = somewhat like me, 1 = a little like me, 0 = not like me at all). The scale has been shown to have high internal consistency for each of the subscales, based on adult samples, demonstrated by the following Cronbach's alphas: private self-consciousness = 0.75, public self-consciousness = 0.84, and social anxiety = 0.79. The scale has also shown to be stable over time. The test-retest correlations for each subscale were: self-consciousness = 0.76, public-self-consciousness = 0.71, and social anxiety = 0.77. The slight modifications made for this study were to simplify the language of four questions to make the scale suitable for children and teens. For example, "I never take a hard look at myself" was changed to: "I never think really hard about myself" (see Appendix E).

Demographics Questionnaire. This short form asks participants to indicate their gender, age and ethnicity, along with a few questions about if they think they are a good liar and why it is important for them to be seen as truthful (Appendix F).

Procedure

After receiving parental permission and child assent, participants completed the *Life Event Inventory* (LEI). Then, participants were divided into small groups of 4-7 participants ($M = 5.1$, $SD = 1.1$) for the illusion game. To assess the illusion of transparency across age, we developed a lie-telling game somewhat similar to that employed by Gilovich et al. (1998), altered to suit children and teens. In the game, one participant at a time was the “speaker.” S/he came to the front of the room and was given a set of four illusion cards with statements written on them that corresponded to their answers on the LEI, as described above. Participants described four of the events from the LEI—two that happened to them and two events that did not (see below). Participants were not told in advance which statements they would be asked to describe, but were instructed to talk about the non-experienced events as if they had really occurred. For example, one participant could have been asked to tell about when s/he was stung by a bee (a self-experienced, true event) and when s/he was bitten by a dog (not self-experienced, lie). All participants made four statements, one at a time. While one participant acted as the speaker, the other player-participants acted as observers and truth/deception detectors and made a veracity judgment after each statement. Neither the speaker nor the observers were told the number of statements in each veracity condition.

To determine which illusion cards they should receive, a research assistant collected the *Life Event Inventory* questionnaires from the participants immediately after they had been completed and assembled a set of four cards for each player, based on their responses. For the majority of participants ($n = 32$), the sets of cards included two events each participant had experienced (the first two “yes” responses on their version of the LEI) and two events they did not experience (the first two “no” responses on the questionnaire). Participants who reported that

they had experienced all of the life events ($n = 1$) or only experienced one of the events ($n = 1$) were given cards that matched their responses.³

Participants were shown one of the four cards at a time by the experimenter and instructed to read each statement aloud and then describe the event as it occurred (or *as if* it had occurred). Participants were instructed to act sincere and make all of their statements as believable as possible to convince the other participants they were being honest. After describing each event aloud with an honest or made-up description, participant-speakers were asked to answer two questions: (1) how many of the other players will believe they are telling the truth (or think they are lying)?; and (2) how many of 10 hypothetical adult observers will believe they are telling the truth (0–10) (or think they are lying)? Participants received one of two versions of the answer sheet, which were identical except for how the response questions were framed. Approximately half of the participants were asked to indicate how many of other players or hypothetical observers would think they were telling the truth, and half were asked to indicate how many of the other players or hypothetical adults would think they were lying. All of the participants in a data collection session received the same version of the speaker sheet. For each statement, the other player-participants filled out a corresponding answer sheet on which they indicated whether they thought the speaker was telling the truth or lying for each of the four statements.

To induce situational public self-awareness during the game, participants were told that some of their descriptions would be video recorded, although no actual recording occurred (previous research shows that people tend to feel more self-aware if they believe they are being

³ The participant who reported experiencing all life events was given four “truth” cards. The participant who reported only experiencing one life event was given one “truth” card and three “lie” cards.

video recorded; Plant & Ryan, 1985). One true and one deceptive description were randomly mock recorded for each participant. Whether or not a statement was recorded was stated on the card and participants noted which statements were recorded on their answer sheet, in order to make the recoding manipulation as salient as possible.

After the illusion of transparency game, participants completed the self-consciousness questionnaire, and then a short demographics form which asked about the participant's age, ethnicity, gender and questions about if they think they are a good liar and why it is important for them to be seen as truthful. When they finished, participants were debriefed and told that nothing was actually recorded. They then had an opportunity to ask questions and receive information explaining the goals and hypotheses of the experiment.

Results

To examine feelings of transparency, a score was created for each statement based on the veracity of the statement and the participant's prediction of the number of players who would either believe they were telling the truth or "see" that they were lying. When a participant made a truthful statement, their truth transparency score was calculated by dividing the number of observers whom they predicted would determine that this statement was true by the total number of observers. When a participant made a deceptive statement, their lie transparency score was calculated by dividing the number of observers whom they predicted would determine that this statement was a lie by the total number of observers. When the framing did not match the veracity of the statement (i.e., asked how many would believe they are telling the truth when they were lying) the inverse of the prediction was used (if the participant thought three people out of five observers would think they are telling the truth, we used two as their prediction of the

number who would think they are lying). A transparency score was calculated for each statement made by participants.

Next, participants' actual transparency was calculated and examined (i.e., whether their lies/truths were accurately distinguished). Detection accuracy scores for each statement were computed by dividing the number of observers who judged the veracity of each statement correctly by the total number of observers. Finally, to assess whether there was evidence for the illusion of transparency, among children and teenagers, we created an illusion of transparency score by computing the difference between participants' predictions of transparency and their actual transparency. Alpha was set at 0.05 for all significance testing.

Feelings of Transparency

Overall, participants predicted that the other players would be 58.1% accurate in determining their veracity ($SD = 0.17$). Participants predicted that the other players would believe their truthful statements 60.3% ($SD = 0.25$) of the time and detect their lies 55.6% ($SD = 0.24$) of the time. The difference between truth and lie transparency predictions was not significant, $t(32) = 0.79$, $p = 0.44$, $d = 0.20$, 95% CI [0.14, 0.25]. However, when compared to chance, predictions of truth detection were significantly above chance, $t(33) = 2.42$, $p = 0.02$, but predictions of the detectability of lies were not significantly different than chance: $t(32) = 1.33$, $p = 0.19$, demonstrating that participants expected their truths to be accurately identified at better than chance rates, but not their lies.

The elementary school children (9–11 years) predicted the other players would believe them 59.8% ($SD = 0.24$) of the time when they were honest and detect their lies 57.9% ($SD = 0.28$) of the time. The children in middle school (10–14 years) predicted the other players would believe them 62.1% ($SD = 0.26$) of the time when honest, and detect their lies 51.3% ($SD = 0.23$)

of the time when they lied. The high school participants (ages 15–17) predicted 66.1% ($SD = 0.11$) of their true statements would be believed and 56.9% ($SD = 0.24$) of their lies would be detected. One-way ANOVAs did not reveal any significant differences in predictions of lie transparency, $F(2, 30) = 0.235, p = 0.79$, or truth transparency, $F(2, 31) = 0.185, p = 0.83$, as a function of age group. There was also not a significant correlation between participant age and their prediction of truth transparency, $r(34) = 0.17, p = 0.33$, or lie transparency, $r(33) = -0.03, p = 0.88$. Feelings of transparency were not seen at higher rates among adolescents than younger children.

Participants were also asked to imagine that ten adults were watching them make their statements and to predict the transparency of each of their statements. When telling truthful statements, participants predicted that 5.7 of out 10 ($SD = 1.6$) hypothetical adults would believe them. When lying, participants predicted that 5.3 of out 10 ($SD = 2.3$) hypothetical adults would detect their lies. The difference between hypothetical truth and lie detectability predictions was not statistically significant, $t(32) = 0.61, p = 0.55, d = 0.16, 95\% \text{ CI } [-0.33, 0.64]$. When compared to chance, the predictions of truth transparency were significantly above chance, $t(33) = 2.58, p = 0.014$, but predictions of the detectability of lies were not significantly different than chance: $t(32) = 0.82, p = 0.42$. Thus, children's hypothetical predictions were similar to their real predictions; children again predicted that their truths would be believed at better than chance rates, but not their lies. One-way ANOVAs did not reveal any significant differences in predictions of lie transparency, $F(2, 30) = 0.24, p = 0.79$, or truth transparency, $F(2, 31) = 1.56, p = 0.23$, for hypothetical observers, as a function of age group.

Framing

How the prediction question was framed was a between-subjects manipulated variable, whereby participants were either asked, “How many of the other players will think you are telling the truth?” (Henceforth: truth frame) or “How many of the other players will think you are lying?” (Henceforth: lie frame).

When presented with the truth frame, participants reported that 66.7% ($SD = 0.19$), of observers would determine their veracity correctly. In the lie frame condition, participants reported a predicted transparency percent of 59.6% ($SD = 0.25$). This difference was not significant, $t(32) = 0.89$, $p = .38$, $d = 0.32$, 95% CI [0.25, 0.40], demonstrating that across veracity conditions, children and adolescents did not report significantly different feelings of transparency in the two framing conditions.

When each statement veracity condition was examined separately, predictions of lie transparency were not significantly different as a function of framing, $t(31) = 0.52$, $p = 0.61$, $d = 0.20$, 95% CI [0.12, 0.28]. However, the differences in truth predictions trended towards significance, $t(32) = 1.84$, $p = 0.075$, $d = 0.66$, 95% CI [0.59, 0.73], suggesting a potential difference in feelings of truth transparency when the prediction question was presented in the truth frame.

Predictions of transparency within the two framing conditions were then compared. Child and adolescent participants queried with the lie frame showed no significant differences between their predictions of the transparency of their true statements ($M = 53.6\%$, $SD = 0.25$) and the predicted transparency of their lies ($M = 57.5\%$, $SD = 0.20$), $t(18) = 0.53$, $p = .60$, $d = 0.18$, 95% CI [0.11, 0.25]. When presented with the truth frame, the difference between their predictions of truths believed ($M = 69.9\%$, $SD = 0.22$) and their predictions of lies detected ($M = 53\%$, $SD =$

.30) also did not reach statistical significance, $t(13) = 1.71$, $p = 0.11$, $d = 0.68$, 95% CI [0.59, 0.77], yet the effect size shows a large difference in the predictions between the two groups.

Situational Self-Awareness

To examine the impact of situational public self-awareness on child and adolescent participants' predictions of transparency, their predictions were compared when they thought they were being recorded versus not recorded. Overall, when participants believed they were being recorded, they predicted more transparency ($M = 62.5\%$, $SD = 0.23$) than when they believed they were not being recorded ($M = 54.4\%$, $SD = 0.23$). However, this difference did not reach statistical significance, $t(31) = 1.55$, $p = 0.13$, $d = 0.36$, 95% CI [0.30, 0.41].

When lying and not recorded, participants predicted that 53.4% ($SD = 0.34$) of their lies would be detected, but when the camera was on, participants predicted that 59.4% ($SD = 0.25$) of their lies would be detected. When truthful, participants' predictions of the believability of their truths was 53.7% ($SD = 0.30$) when not recorded, but when recorded, this prediction grew to 67.7% ($SD = 0.33$). A paired-samples t -test revealed no differences as a function of the video camera when participants were lying, $t(30) = 0.97$, $p = 0.34$, $d = 0.22$, 95% CI [0.14, 0.29]. However, there was a statistically significant increase in predictions of the likelihood that their true statements would be believed when told they were being video recorded, $t(30) = 2.10$, $p = 0.038$, $d = 0.51$, 95% CI [0.43, 0.59]. When participants were telling the truth and they thought they were being videotaped, they were more likely to think their truths would be accurately determined, demonstrating an increase in feelings of transparency. Thus, Hypothesis 4 was partially supported as situational self-awareness increased transparency for truthful statements.

Participants' predictions of their transparency for hypothetical adult observers were examined as a function of video recording. When lying and not recorded, participants predicted

that 5.2 ($SD = 2.74$) hypothetical adults would detect their lie, but when the camera was on, participants predicted that 5.8 ($SD = 2.68$) of hypothetical adults would detect their lie. When truthful, participants' predicted that 5.5 ($SD = 2.06$) hypothetical observers would believe them when not recorded, but when recorded, participants predicted 6.1 ($SD = 2.42$) would believe their true statements. A paired-samples t -test revealed no differences as a function of the video camera when participants were telling the truth, $t(30) = 1.48$, $p = 0.15$, $d = 0.29$, 95% CI [-0.27, 0.86]. However, there was a marginally statistically significant difference in predictions of the likelihood that their false statements would be detected when told they were being video recorded or not, $t(30) = 1.75$, $p = 0.09$, $d = 0.30$, 95% CI [-0.36, 0.97]. When lying, participants predicted more transparency when they believed they were being recorded, again partially supporting Hypothesis 4.

To examine the degree to which statement veracity, video recording (situational public self-awareness), framing, and participant grade level each contributed to feelings of transparency, we conducted a repeated measures analysis of variance (ANOVA) in which prediction of transparency was the dependent variable. The analysis revealed no main effect of veracity, $F(1, 24) = 0.51$, $p = 0.48$, $\eta^2 = 0.02$. There was a marginally significant main effect for video recording, $F(1, 24) = 3.83$, $p = 0.06$, $\eta^2 = 0.14$, such that participants predicted more transparency when they thought they were being recorded ($M = 0.66$, $SD = 0.23$) than when they were not being recorded ($M = 0.53$, $SD = 0.24$). There was not a significant main effect for framing, $F(1, 24) = 1.58$, $p = 0.22$, $\eta^2 = 0.06$, nor were any significant interactions revealed.

Since the descriptive analyses indicated that the experimental manipulations may have impacted truthful and deceptive statements differently, to gain a full understanding of the impact of public self-awareness and framing on feelings of truth and lie transparency, each veracity

condition was investigated separately. Additional repeated measures ANOVAs were conducted in which participants' predictions of truth transparency were the dependent variable for true statements and predictions of lie transparency were the dependent variable for false statements. When participants were truthful, the repeated measures ANOVA revealed a significant main effect for video recording, $F(1, 29) = 4.41, p < 0.05, \eta^2 = 0.13$, such that when participants believed they were being recorded, they were more likely to predict that true statements would be believed ($M = 70\%, SD = 0.32$) than when they were not recorded ($M = 54\%, SD = 0.30$). Framing had a marginally significant main effect, $F(1, 29) = 3.25, p = 0.08, \eta^2 = 0.10$, such that participants presented with the truth frame were somewhat more likely to predict that their true statements would be believed ($M = 70\%, SD = 0.32$) than participants presented with the lie frame ($M = 55\%, SD = 0.30$). The interaction between video recording x framing was not significant, $F(1, 29) = 0.07, p = 0.79, \eta^2 = 0.003$. In contrast, when participants were lying, a repeated measures ANOVA showed no main effect of video recording, $F(1, 29) = 0.95, p = 0.34, \eta^2 = 0.03$, or framing, $F(1, 29) = 0.17, p = 0.68, \eta^2 = 0.01$, nor was there a significant framing x recording interaction, $F(1, 29) = 0.03, p = 0.88, \eta^2 = 0.001$.

A repeated measures ANOVA was conducted with participants' predictions of how transparent they would be to ten hypothetical observers as the dependent variable to examine the degree to which statement veracity, video recording (situational public self-awareness), framing, and participant grade level contributed to these predictions. The analysis revealed no main effect of veracity, $F(1, 24) = 0.14, p = 0.71, \eta^2 = 0.01$. There was a marginally significant main effect for video recording, $F(1, 24) = 3.56, p = 0.07, \eta^2 = 0.13$, such that participants predicted more hypothetical observers would judge their veracity accurately when they thought they were being recorded ($M = 6.1, SD = 2.14$) than when they were not being recorded ($M = 5.3, SD = 1.80$).

There was a significant main effect for framing, $F(1, 24) = 4.80, p = 0.04, \eta^2 = 0.17$, such that participants predicted more transparency when answering the truth frame ($M = 6.5, SD = 2.22$) than the lie frame ($M = 5.2, SD = 2.67$). There was not a significant main effect of participant grade level, $F(1, 24) = 1.49, p = 0.25, \eta^2 = 0.11$, nor were there any significant interactions between the variables.

To examine how the age of an observer might impact children's and adolescents' predictions of transparency, the participants' predicted transparency percentages for real (peers) and hypothetical (adult) observers were compared for true and deceptive statements. Paired t -tests demonstrated that there were not differences in predicted transparency when truthful, $t(33) = 0.40, p = 0.69, d = 0.08, 95\% \text{ CI } [0.03, 0.14]$, or when lying, $t(32) = 0.06, p = 0.95, d = 0.01, 95\% \text{ CI } [0.05, 0.07]$, as a function of the observer's age.

Truth/Deception Detection

Overall, the other child and adolescent players were 56.1% accurate ($SD = 0.19$) in determining participants' veracity. They were 50.9% accurate ($SD = 0.24$) in determining veracity for true statements and 60.1% ($SD = 0.24$) accurate at detecting the children's lies. The difference between truth and lie detection accuracy was not statistically significant, $t(33) = 1.98, p = 0.056, d = 0.42, 95\% \text{ CI } [0.36, 0.48]$. However, though accuracy in detecting truths was not significantly different than chance, $t(33) = 0.21, p = 0.83$, accurate detection of lies was significantly greater than chance, $t(32) = 2.42, p = 0.021$, demonstrating that the participants' lie statements were relatively more detectable and thus, more transparent, than their true statements.

Among the elementary school children (9–11 years), true statements were correctly identified as true 48.3% ($SD = 0.28$) of the time and lies were accurately detected 72% ($SD = 0.20$) of the time. This may indicate that our elementary school participants were fairly

transparent when lying. For the children in the middle school group (10–14 years), the other players were 50% ($SD = 0.32$) accurate in determining the veracity of true statements and 42.5% ($SD = 0.21$) accurate in determining the veracity of false statements. Among the high school students (15–17 years), the other players were 57.7% ($SD = 0.25$) accurate in detecting truths and 55.6% ($SD = 0.23$) accurate in detecting lies. One-way ANOVAs did not reveal any age effects for truth detection, $F(2, 31) = 0.38, p = 0.69$, but showed a significant difference in the detectability of lies by grade level, $F(2, 30) = 6.71, p < 0.01, d = 1.53, [1.42, 1.61]$. Follow-up pair-wise comparisons showed that the elementary school children's lies were significantly more detectable ($M = 72\%, SD = 0.20$) than middle school students' ($M = 43\%, SD = 0.21$), $p < 0.01$. The lie detection accuracy for high school students was not significantly different from either of the other two groups. Therefore, there is evidence to support Hypothesis 3 that children become better liars (less transparent) as they develop through late childhood.

A repeated measures ANOVA was conducted to examine how framing, video recording, veracity, and grade impacted veracity identification accuracy. The analysis revealed no main effect of veracity, $F(1, 24) = 1.75, p = 0.20, \eta^2 = 0.07$, or video recording, $F(1, 24) = 0.24, p = 0.63, \eta^2 = 0.01$. There were also no main effects of grade, $F(2, 24) = 1.52, p = 0.24, \eta^2 = 0.11$, or framing, $F(1, 24) = 0.04, p = 0.85, \eta^2 = 0.00$, however, there was a statistically significant veracity x grade interaction, $F(2, 24) = 3.63, p = 0.04, \eta^2 = 0.23$. This interaction stems from the high accuracy at which observers were able to identify the elementary school students' lies ($M = 73.8\%, SD = 0.29$) but not their true statements ($M = 49.8\%, SD = 0.37$). This difference in accuracy as a function of veracity was not present for the older students (see Figure 1).

To examine if there was a perceiver bias, the percentages of truth and lie judgments were compared. Overall, participant-observers judged 45.7% ($SD = 0.15$) of statements as truths and

54.3% ($SD = 0.15$) as lies. These rates were not significantly different, $t(33) = 1.67, p = 0.10$.

When mock-recorded, the percentages of statements judged as truths (47.6%) or lies (52.4%) did not differ significantly, $t(33) = 0.663, p = 0.51$. One-way ANOVAs did not reveal a significant difference in veracity judgments as a function of framing for either truths or lies, $F(1, 32) = 0.49, p = 0.49$ (results were identical for both statement types). Therefore, it does not appear that there was a perceiver bias when judging veracity.

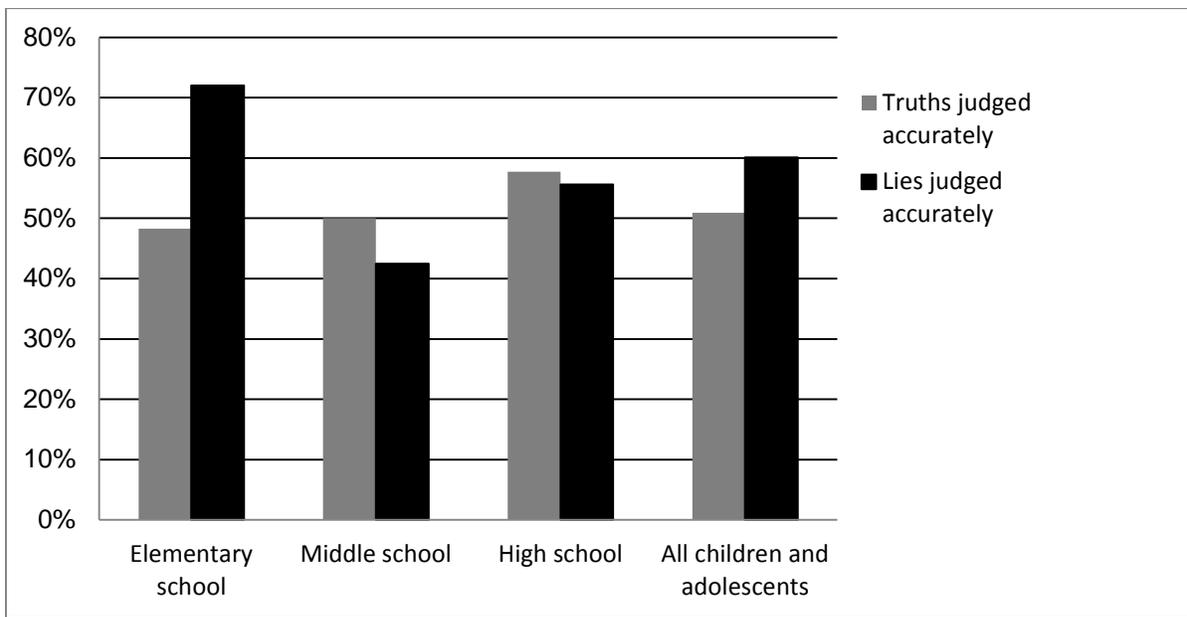


Figure 1. Percentage of other players who accurately determined the veracity of true and false statements by grade level (Study 1).

The Illusion of Transparency

The means of participants' predictions of transparency were compared to their actual transparency to determine if an illusion of transparency was observed. For truths, the difference between predicted transparency 61.8% and actual transparency, 50.9% was statistically

significant, $t(33) = 2.04$, $p < 0.05$, $d = 0.48$, 95% CI [0.43, 0.53]. For lies, the difference between predicted transparency, 55.7%, and actual transparency, 60.1%, was not significant, $t(32) = -0.89$, $p = 0.38$, $d = -0.18$, 95% CI [-0.24, -0.13] and in the opposite direction as predicted. This finding partially supports Hypothesis 1, as participants demonstrated an illusion of transparency when truthful but not when lying.

For true statements, child and adolescent participants demonstrated an illusion of transparency, over-predicting the transparency of their statements by 11.3%. However, for lies, participants did not show an illusion of transparency, under-predicting the transparency of their false statements by 4.2%. A paired-samples t -test showed that the difference between the illusion of transparency for truths and lies was significant, $t(32) = 2.20$, $p = 0.035$, $d = 0.53$, 95% CI [0.46, 0.60], demonstrating a greater illusion of transparency when truthful than when lying.

An illusion of transparency score was computed by subtracting the percent of observers who judged a statement accurately from participants' predicted transparency score. Therefore, a positive score demonstrates an illusion of transparency (an over-prediction of the transparency of their statement). To investigate grade level group differences, as well as the role of veracity, video recording and framing, a repeated measures ANOVA was conducted with the illusion of transparency score as the dependent measure. Results revealed a main effect of video recording, $F(1, 24) = 5.21$, $p = 0.03$, $\eta^2 = 0.18$, such that participants experienced more of an illusion of transparency when they believed they were being video recorded ($M = 10\%$, $SD = 0.26$) than when they believed they were not being recorded ($M = -4.1\%$, $SD = 0.30$). There was no main effect of veracity, $F(1, 24) = 2.10$, $p = 0.16$, $\eta^2 = 0.08$, or framing, $F(1, 24) = 1.19$, $p = 0.29$, $\eta^2 = 0.05$ on illusion of transparency scores. Analyses also revealed that there was also no main effect of grade level, $F(2, 24) = 1.09$, $p = 0.35$, $\eta^2 = 0.08$, as well as no significant interactions.

Hypothesis 2 was not supported as it was predicted that an illusion of transparency would be seen at higher rates among adolescent participants than younger participants. Hypothesis 6 was also not supported, as a significant interaction between framing and veracity was not observed.

Again, truths and lies were re-analyzed separately, and the repeated measures ANOVA, with the illusion of transparency for true statements as the dependent variable, revealed a marginally significant main effect of framing, $F(1, 26) = 3.38, p = 0.077, \eta^2 = 0.12$. Participants experienced a greater illusion of transparency for true statements when presented with the truth frame ($M = 20.6\%, SD = 0.42$) than the lie frame ($M = -1\%, SD = 0.48$). There was no main effect of video recording revealed for true statements, $F(1, 26) = 0.94, p = 0.34, \eta^2 = 0.04$. Yet, analyses of the illusion of transparency when lying revealed only a main effect of video recording, $F(1, 26) = 5.52, p = 0.03, \eta^2 = 0.18$, whereby when participants thought they were being videotaped, they experienced more of an illusion of transparency ($M = 7.4\%, SD = 0.32$) than when they did not think they were being recorded ($M = -9.5\%, SD = 0.39$). This finding offers additional support for Hypothesis 4.

Self-Consciousness

To assess the relationship between dispositional self-consciousness and the illusion of transparency, the total self-consciousness score and the scores on each of the three subscales (private, public, social anxiety) were correlated with participants' predictions of transparency and their illusion of transparency scores when lying and telling the truth and when they believed they were being recorded or not recorded. Contrary to what was predicted, none of the measures of self-consciousness correlated with the illusion of transparency scores in any conditions, demonstrating no support for the second part of Hypothesis 5. However among the correlations with participants' feelings of transparency, there were significant positive correlations between

participants' total self-consciousness score, $r(32) = 0.38, p = 0.03$, and their public self-consciousness, $r(32) = 0.35, p < 0.05$, with their feelings of transparency when they believed they were being videotaped. Though this finding does not truly support Hypothesis 5, it does demonstrate that video recording can potentially influence feelings of transparency among participants with higher levels of self-consciousness, especially public self-consciousness. None of the other measures of feelings of transparency were found to be related to self-consciousness scores (see Table 1).

Table 1

Pearson's Product Moment Correlations (and Two-Tailed Significance Levels) for Dispositional Self-Consciousness with Predictions of Transparency and the Illusion of Transparency (Study 1)

Self-Consciousness Scale	Feelings of Transparency					Illusion of Transparency				
	Truth (n = 34)	Lie (n = 33)	Video (n = 34)	No Video (n = 34)	Overall (n = 34)	Truth (n = 34)	Lie (n = 33)	Video (n = 34)	No Video (n = 34)	Overall (n = 34)
Private SC	.051 (.774)	.004 (.982)	.202 (.251)	-.086 (.629)	.078 (.659)	-.281 (.107)	-.215 (.231)	-.163 (.357)	-.163 (.357)	-.321 (.064)
Public SC	.313 (.072)	.000 (.998)	.345* (.046)	-.095 (.591)	.187 (.289)	-.024 (.893)	-.243 (.172)	-.283 (.105)	-.283 (.105)	-.194 (.272)
Social Anxiety	.168 (.341)	.056 (.756)	.247 (.159)	.003 (.988)	.176 (.319)	.157 (.374)	-.070 (.699)	.154 (.383)	.154 (.383)	.101 (.570)
Total SC	.257 (.143)	.028 (.879)	.379* (.027)	-.084 (.635)	.212 (.229)	-.064 (.719)	-.244 (.170)	-.138 (.436)	-.138 (.436)	-.192 (.276)

Note. *= $p < .05$.

A significant relationship was not revealed between participants' grade level and their total self-consciousness score, $r(32) = -0.01, p = 0.96$. There were also not significant

correlations between grade level and private self-consciousness, $r(32) = 0.04$, $p = 0.83$, public self-consciousness, $r(32) = 0.16$, $p = 0.38$, nor social anxiety, $r(32) = -0.22$, $p = 0.22$. One-way ANOVAs did not show significant mean differences in self-consciousness between the different data collection sites. This finding does not support research that demonstrates an increase in self-consciousness through late childhood and early adolescence and may explain why age differences were not found on participants' feelings of transparency and their illusion of transparency. Stemming from the body of literature on self-consciousness development, it was predicted that middle school students would report the highest levels of self-consciousness. However, middle school students reported lower levels of total self-consciousness ($M = 32.5$, $SD = 10.44$) than elementary school students ($M = 35.65$, $SD = 9.25$) and high school students ($M = 34.88$, $SD = 10.56$), though the mean differences were not significant, $F(2, 31) = 0.43$, $p = 0.66$, $\eta^2 = 0.03$.

Additional Exploratory Analyses—Are You a Good Liar?

All participants were asked if they think they are good liars or not and 60.6% reported that they are good liars. We then explored if participants' assessments of their lying skills correlated with other factors, such as self-consciousness, feelings of transparency and their detectability, and some differences were revealed. There was a significant negative correlation between self-reported lying ability and the social anxiety subscale of the Self-Consciousness Scale, $r(34) = -0.37$, $p = 0.03$. Participants who reported that they were good liars had significantly lower scores on the social anxiety subscale ($M = 6.4$, $SD = 4.12$) than those who reported that they were not good liars ($M = 9.92$, $SD = 4.82$), $t(32) = 2.25$, $p = 0.03$, $d = 0.82$, 95% CI [-0.61, 2.25]. Significant differences were not observed on the other Self-Consciousness subscales.

Exploratory analyses also revealed some additional differences between good and bad liars that approached significance. There was a marginally significant negative correlation between self-reported good liars and the lie detection accuracy of observers, $r(33) = -0.30$, $p = 0.085$. Further analysis of this relationship showed that self-reported good liars predicted that their lies were less likely to be detected ($M = 49.4\%$, $SD = 0.22$), than self-reported bad liars ($M = 65.4\%$, $SD = 0.25$), $t(32) = 1.92$, $p = 0.06$, $d = 0.71$, 95% CI [0.63, 0.78]. Also, it appears as though participants had some insight as to their lying abilities because the false statements of self-reported good liars were detected less frequently ($M = 54.3\%$, $SD = 0.24$) than participants who reported not being good liars ($M = 68.9\%$, $SD = 0.22$). This difference also approached significance, $t(31) = 1.78$, $p = 0.08$, $d = 0.65$, 95% CI [0.58, 0.73].

Discussion

This first study explored potential early age differences in the illusion of transparency. It was predicted that an illusion of transparency would be observed among the child and adolescent participants when they told the truth and when they lied. This hypothesis was partially supported, as participants demonstrated an illusion of transparency for truthful statements but not for lies. It was predicted that an illusion of transparency would be stronger and more prevalent among adolescents than children. This prediction stemmed from the expectation that adolescents would report stronger feelings of transparency, given their likely developmentally-driven increase in self-awareness; however, statistically significant differences in feelings of transparency as a function of age were not observed. Therefore, the results did not support the second hypothesis. Yet, although participant age group was unrelated to predictions of transparency for both truthful and deceptive statements, some differences were observed. The two older groups of participants predicted that their truths would be more transparent than their lies, while the younger

participants predicted approximately the same degree of transparency for truth and lies. This expectation of the believability of their true statements, observed in the older groups, may be a result of a truth bias (Vrij, 2010), that has not yet developed among the youngest participants. Research has consistently found that deception detectors are more likely to judge statements as truthful rather than deceptive (e.g., Levine, Park, & McCornack, 1999). It is possible that speakers also exhibit a truth bias when making their predictions of detectability. One of the explanations of the truth bias cited by Vrij (2010) stems from research by Goffman (1959). Goffman posited that people behave as actors in the theater of life and the “self” shown to others is not a true version. As such, there is an expectation that others will honor the way we choose to present ourselves. Thus, when displaying a truthful version ourselves, there is an expectation that others will accept that version and see us as truthful. Among the elementary school participants, this expectation may have yet to manifest itself, possibly due to a less well developed sense of self and lower levels of self-consciousness (Yee & Flanagan, 1985) but also as a result of less developed lie-telling skills. Experience being actually transparent and having others detect the veracity of their everyday statements with higher accuracy may minimize any truth bias. This would explain both the reduced truth transparency prediction and a slightly greater lie transparency prediction when compared to the older participants. Less effective lie-telling and experience being detected may cause the youngest participants to predict more transparency when lying.

This difference in truth bias may also explain why the pattern of detection accuracy was different for the elementary school students and the older groups. Among the middle and high school students, detection accuracy rates were similar to what is often reported in the literature on deception detection – rates close to chance, with truths detected at slightly higher rates than

lies. However, among the elementary school students, lies were detected at significantly higher rates than truths. Perhaps the absence of a truth bias by observers yielded the higher accuracy in detecting deception. This corresponds to earlier cited research by Edelman et al. (2006) in which children's lies were more detectable than their truths due to the absence of a truth bias when adults evaluated children's interviews.

In contrast to expectations, the multivariate analysis investigating how each of the manipulated variables impacted participants' predictions of transparency revealed only a significant effect of the public self-awareness manipulation. Participants predicted more statement transparency when they believed they were being videotaped, supporting our fourth hypothesis. Child and adolescent participants felt more transparent when they believed they were being videotaped – when they were made publically self-aware. The mock recording may have increased awareness of public aspects of the self because the recording suggests that these statements will be observed by others, which, in turn, led to overestimations of how transparent their veracity would be to observers. This finding has important implications because video cameras are often present during interviews and interrogations. If child and adolescent participants feel more transparent when video recorded, it can lead to differences in suspects' or witnesses' willingness to speak with the police, as a function of their guilt or innocence. It is possible that innocent suspects would be more likely to subject themselves to a police interview and guilty suspects, less likely – which is the opposite of an ideal scenario.

One of the primary reasons that age differences were hypothesized in feelings of transparency was that self-consciousness was expected to vary as a function of age. Though previous research has shown that self-consciousness increases through childhood and early adolescence (e.g., Elkind & Bowen, 1979), that finding was not replicated in this study.

Participants' self-consciousness was unrelated to grade level, and this may explain why age differences were not revealed between participants' grade and feelings of transparency or the illusion of transparency, and why Hypothesis 2 was not supported.

The descriptive analyses suggested that the experimental manipulations impacted true statements more than lies. Predictions of the transparency of true statements were impacted by how the question was framed and by our video recording manipulation of situational public self-awareness. When participants were asked to estimate the number of other players who would judge their statements as lies, there were no differences in their predictions of the transparency of their true or false statements, but participants were more likely to predict that their true statements would be transparent when asked to estimate the number of players who would judge their statements as true. This finding supports the sixth hypothesis—an interaction between question framing and feelings of transparency.

When truthful and deceptive statements were analyzed separately, it was revealed that neither the self-awareness manipulation nor the framing manipulation impacted predictions of lie transparency; however, both manipulations played a role in participants' predictions of the transparency of their true statements. Participants were more likely to predict that their true statements would be believed when they were made more situationally self-aware (believed they were being videotaped) and when they were queried with the truth frame. It is possible that asking participants to predict how many people think they are lying when they told the truth reduced the truth bias, but the truth bias was enhanced when presented with the truth frame. Additionally, according to Haas (1984), when people believe they are being recorded, there is an increase in public self-awareness which, in turn, causes them to adopt an external vantage point and view themselves from another person's perspective. When telling the truth and videotaped,

participants expected others to judge them as truthful, resulting in an increase in feelings of transparency when viewing themselves from the perspective of another.

As stated at the start, an illusion of transparency is made up of two components: predictions of transparency and actual detectability. The results demonstrated that participants were accurate at determining veracity at slightly greater than chance levels, corresponding to the majority of the literature on deception detection (Bond & DePaulo, 2006). Though predictions of transparency did not differ as a function of age, actual transparency was impacted by grade, as shown by the significant grade x veracity interaction. Lies told by the elementary school children were more detectable than those told by the middle school participants. Though neither group differed significantly from the high school participants, there is a limitation to this comparison as there was only one data collection session with high school participants, in which all were queried with the lie frame manipulation. An additional limitation of this study is that it is possible that other factors co-varied with grade level since the different schools from which participants were recruited varied in other demographics, such as ethnicity. In spite of the limitations, there is evidence that the lie statements made by the youngest of our sample were more easily detected. This offers support to our second hypothesis—older participants would be less detectable than younger participants and that younger participants would show greater levels of actual transparency. This finding also corresponds with literature on the development of lie-telling abilities (e.g., Feldman et al., 1979).

An illusion of transparency was operationalized as the difference between participants' predictions of transparency and the degree of accuracy at which others could determine statement veracity. It was predicted that an illusion of transparency would be observed for all players for both truthful and deceptive statements. Yet our results indicated that an over

prediction of the transparency of participants' statements only occurred when participants were telling the truth. When lying, participants did not exhibit an illusion of transparency, predicting that their lies would be less transparent than they actually were. It was unexpected that an illusion of transparency was not seen among participants when they lied. This is likely due to both of the two factors that make up the illusion of transparency. First, participants' feelings of transparency were lower when lying than when telling the truth, and second, participants' veracity was detected at higher rates when lying than when telling the truth. Each may reflect children's lesser skill and understanding of the mechanics of effective lie-telling.

The illusion was also impacted by situational self-awareness; when participants believed they were being videotaped, the illusion of transparency was more prevalent. Since our manipulated variables did not impact detection accuracy, the impact of video recording on feelings of transparency was driving this effect. In support of Hypothesis 4, participants, regardless of veracity, experienced greater levels of an illusion of transparency when they were made to feel more publicly self-aware. Moreover, participants with higher levels of total self-consciousness and public self-consciousness appeared to be impacted by the self-awareness manipulation more than participants with lower scores on these scales. That is, participants, who already felt self-conscious, felt even more transparent when made publicly self-aware. However, trait self-consciousness was not significantly related to an illusion of transparency, contrary to our prediction. Previous research has found both private (Gilovich et al., 1998) and public self-consciousness (Vorauer & Ross, 1999) to impact transparency, but this research was not conducted with children and adolescents. It is possible that these young participants had less insight into their own self-consciousness or did not answer the questionnaire carefully or reliably. This null finding is one of the reasons the study was replicated with an adult sample.

The conclusions that can be drawn from this study are limited by a small sample size of child and adolescent participants, which resulted in low statistical power for the detection of small effects, such as the interactions. Yet, it was observed that participants experienced an illusion of transparency when truthful but not when lying, and public self-awareness increased feelings of transparency. A relationship between dispositional self-consciousness and feelings of transparency was not observed. Self-consciousness scores did not differ by grade, therefore, predictions of transparency also did not differ by grade, nor did the illusion of transparency. Nevertheless, with a larger sample, it is possible that the observed age differences in the detectability of lies might have been significant and driven more pronounced age differences in the illusion of transparency. Also, the impact of framing and video recording on feelings of transparency both had marginally significant results that may have reached statistical significance with a larger sample.

CHAPTER 9: STUDY 2

Study 2 was a replication of Study 1 and was identical in most details, except for the sample and setting. The purpose of this study was to have a comparison group of adult participants to compare to our younger sample, using the same materials and procedures, in order to explore potential differences in the illusion of transparency between children and adults. This study also allowed us to more rigorously test our hypotheses about the impact of framing on the illusion of transparency in truth- and lie-telling contexts and explore the relative impact of state versus dispositional self-consciousness on the illusion among a larger sample of adults, whom have been most often examined in research on the illusion of transparency. The following results were hypothesized:

- (1) The illusion of transparency would be observed for both truthful and deceptive statements.
- (2) Participants would feel more transparent when situationally publicly self-aware (told that a camera is on and recording their statements) than when not made self-aware (told the camera is off and not recording).
- (3) Participants with higher trait self-consciousness scores would feel more transparent when lying and telling the truth than participants with lower levels of self-consciousness. The study explored potential relationships between the private, public, and social anxiety subscales of the Self-Consciousness Scale and the illusion of transparency, but it was predicted that all would increase feelings of transparency.
- (4) When the question was framed as, “How many of the other players will believe you are telling the truth?” we would see an increase in predictions of transparency among

truth-tellers; when it was framed as, “How many will think you're lying?” we would see an increase in predictions of transparency among liars.

Method

Participants

Ninety-one⁴ undergraduate psychology students between the ages of 17 and 42 years (25 males; $M_{\text{age}} = 20.5$ years, $SD = 4.6$) from the John Jay College Psychology Department Research Experience Program subject pool were recruited to participate in Study 2. Participants were from diverse self-reported backgrounds, including 39 Hispanic-American, 16 Anglo-American, 16 African-American, and 12 Asian-American participants, as well as 8 participants from mixed/multiple backgrounds. All participants received course credit for their participation.

Design

The design for Study 2 is the same as for Study 1.

Materials

All materials for Study 2 are identical to those for Study 1.

Procedure

Study procedures are identical to Study 1, with a few exceptions. First, participants were recruited from and participated in different locations. Also, undergraduate participants were awarded course credit for participation, whereas Study 1 participants received small prizes. The group sizes differed as well. Adults participated in groups that ranged from 3–6 participants, along with one group of 9 participants ($M = 5.4$, $SD = 1.5$).

⁴ A power analysis using G*Power indicated statistical power of at least 0.99 for the sample of $n = 91$, for medium effect sizes, $\alpha = .05$ and $d = .5$, consistent with previously reported main effects. A sample size of $n = 72$ would be required to detect $d = 0.25$ effects, consistent with previously reported interaction effects.

The statements participants were asked to make were about real-life events that may or may not have happened to them in the past. As such, not all participants made statements in every condition. Two participants reported that all of the events on the LEI had occurred in their past, and therefore, made four true statements. One participant reported that none of the LEI events had happened and told four lies. Two participants told one truth and three lies and another four participants told three truths and one lie. When participants made more than one statement in a condition, the prediction and detection scores were averaged.

Results

Feelings of Transparency

Overall, adult participants predicted that the other players would be 55.5% ($SD = 0.16$) accurate in determining veracity. Participants predicted that the other players would believe their truthful statements 63.5% ($SD = 0.25$) of the time and detect their lies 48.4% ($SD = 0.24$) of the time. A paired-samples t -test revealed a significant difference between participants' predictions of their truth and lie transparency, $t(87) = 3.66, p < 0.001, d = 0.62, 95\% \text{ CI } [0.59, 0.66]$. When compared to chance, the predictions of truth believability were significantly above chance, $t(89) = 5.20, p < 0.001$, but predictions of the detectability of lies were not significantly different than chance: $t(88) = 0.63, p = 0.53$, demonstrating that adults were more likely to predict that their truths would be believed than their lies detected.

Participants were also asked to imagine that ten other adults were watching them make their statements and to predict the transparency of each of their statements. When telling truthful statements, participants predicted that 6.2 of out 10 ($SD = 2.2$) hypothetical adults would believe them. When lying, participants predicted that 4.9 of out 10 ($SD = 2.1$) hypothetical adults would detect their lies. A paired-samples t -test revealed that the difference between hypothetical truth

and lie transparency predictions was significant, $t(87) = 3.11$, $p = 0.02$, $d = 0.59$, 95% CI [0.27, 0.90]. When compared to chance, the predictions of truth transparency were significantly above chance, $t(90) = 5.29$, $p < 0.001$, but predictions of the detectability of lies were not significantly different than chance, $t(89) = 0.23$, $p = 0.82$, demonstrating that the participants' hypothetical predictions were similar to their real predictions, with adult participants more likely to predict that their truths would be believed than their lies detected.

Framing

Comparisons of predictions of transparency between the two framing conditions, revealed no difference in overall feelings of transparency as a function of framing, $t(89) = 0.77$, $p = 0.83$, $d = 0.04$, 95% CI [0.01, 0.08]. However, analyses of statement veracity conditions separately revealed that predictions of both lie transparency, $t(87) = 3.81$, $p < 0.000$, $d = 0.82$, 95% CI [0.77, 0.86], and truth transparency, $t(88) = 4.62$, $p < 0.000$, $d = 0.98$, 95% CI [0.94, 1.03], were significantly different as a function of framing.

Analyses within each framing condition showed that when participants were queried with the lie frame (i.e., how many observers will think they are lying), there were not significant differences between their predictions of the believability of their true statements ($M = 52.8\%$, $SD = 0.24$) and the predicted detectability of their lies ($M = 57.4\%$, $SD = 0.20$), $t(44) = 0.85$, $p = 0.40$, $d = 0.20$, 95% CI [0.15, 0.25]. However, when presented with the truth frame (i.e., how many observers will think you are telling the truth), the difference between their predictions of truths believed ($M = 75.6\%$, $SD = 0.20$) and their predictions of lies detected ($M = 39.6\%$, $SD = 0.22$) was highly significant, $t(42) = 8.04$, $p < 0.000$, $d = 1.76$, 95% CI [1.71, 1.80]. Participants were more likely to predict that their true statements would be believed than their lies detected when questioned with the truth frame.

Situational Self-Awareness

To examine the impact of situational public self-awareness on adult participants' predictions of their transparency, their predictions were compared when they thought they were being recorded versus not recorded. When lying and not recorded, participants predicted that 50.9% ($SD = 0.29$) of their lies would be detected, and when the camera was on, participants predicted that 46.7% ($SD = 0.33$) of their lies would be detected. When truthful, participants' predictions of the believability of their lies was 64.4% ($SD = 0.31$) when not recorded, but when recorded, this prediction was 60.2% ($SD = 0.31$). A paired-samples t-test revealed no differences as a function of the video camera when participants were lying, $t(84) = 1.00$, $p = 0.32$, $d = 0.14$, 95% CI [0.09, 0.18] or telling the truth, $t(83) = 1.02$, $p = 0.31$, $d = 0.14$, 95% CI [0.09, 0.18].

Participants' predictions of their transparency for ten hypothetical observers were examined as a function of video recording. When lying and not recorded, participants predicted that 5.3 ($SD = 2.37$) hypothetical adults would detect their lie, but when the camera was on, participants predicted that 4.7 ($SD = 2.42$) of hypothetical adults would detect their lie. When truthful, participants' predicted that 6.2 ($SD = 2.50$) hypothetical observers would believe them when not recorded, but when recorded, participants predicted 6.3 ($SD = 2.48$) would believe their true statements. A paired-samples t-test revealed no differences as a function of the video camera when participants were telling the truth, $t(83) = 0.16$, $p = 0.87$, $d = 0.02$, 95% CI [-0.39, 0.36]. However, there was a statistically significant difference in predictions of the likelihood that their false statements would be detected by hypothetical observers when told they were being video recorded or not, $t(84) = 2.24$, $p = 0.03$, $d = -0.25$, 95% CI [-0.61, 0.11]. When lying, participants predicted more transparency when they believed they were not being recorded. This finding runs

counter to the hypothesis and the results of study 1, as participants felt more transparent when they believed they were not video recorded than when they thought they were being recorded.

To examine the degree to which statement veracity, framing and situational public self-awareness contributed to feelings of transparency, we conducted a repeated measures ANOVA with predictions of transparency as the dependent variable. The analysis revealed a significant main effect of veracity, $F(1, 76) = 13.06, p = .001, \eta^2 = 0.15$, demonstrating that participants were more likely to predict that their true statements would be believed ($M = 0.64, SD = 0.22$) than their lies detected ($M = 0.50, SD = 0.22$). There was not a significant main effect for framing, $F(1, 76) = 0.59, p = 0.45, \eta^2 = .01$, nor for video recording, $F(1, 76) = 2.26, p = 0.14, \eta^2 = 0.03$. There was a significant veracity x framing interaction, $F(1, 76) = 28.02, p < 0.001, \eta^2 = 0.27$, such that participants' predictions of transparency when telling the truth were greater when presented with the truth frame ($M = 74.7\%, SD = 0.33$) than the lie frame ($M = 41.8\%, SD = 0.33$). However when participants were lying, their predictions of transparency were greater when presented with the lie frame ($M = 57.8\%, SD = 0.30$) than the truth frame ($M = 52.5\%, SD = 0.30$), as described above, supporting Hypothesis 4 (see Figure 2).

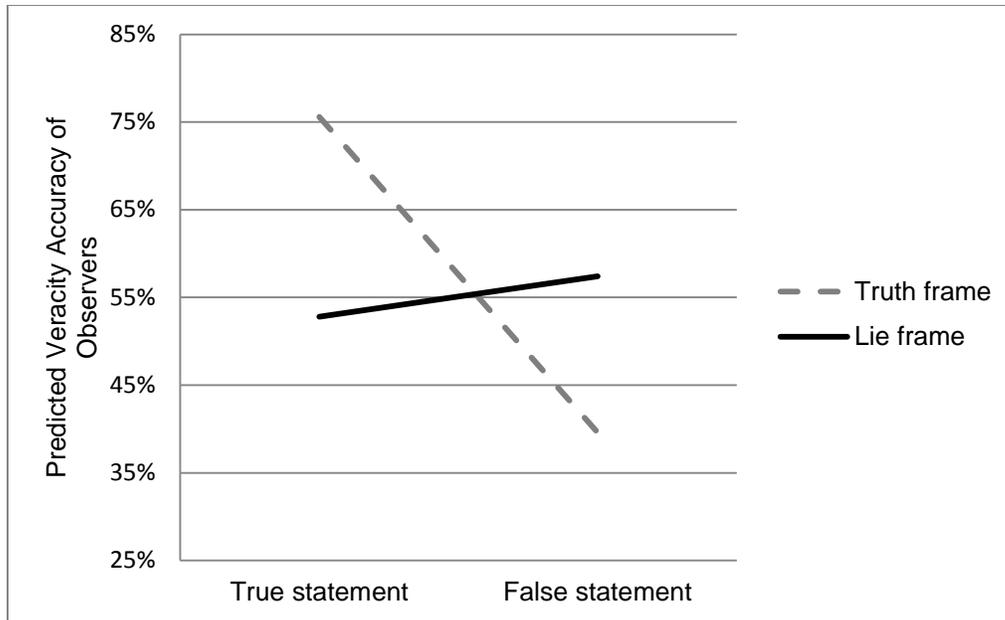


Figure 2. Speakers' predicted transparency percentage as a function of statement veracity and question framing (Study 2)

Because the veracity of the participants' statements strongly impacted predictions of transparency, it was necessary to investigate the impact of framing and video recording for both veracity conditions separately. Additional repeated measures ANOVAs were conducted in which predictions of truth transparency was the dependent variable for true statements and predictions of lie transparency was the dependent variable for false statements.

When participants were truthful, the repeated measures ANOVA did not reveal a significant main effect for video recording, $F(1, 82) = 0.83, p = 0.37, \eta^2 = 0.01$ and the interaction between video recording x framing was also not significant, $F(1, 82) = 1.87, p = 0.18, \eta^2 = 0.02$. However, there was a significant main effect of framing on truth transparency, $F(1,$

82) = 19.59, $p < 0.00$, $\eta^2 = 0.19$. When truthful, participants predicted higher transparency with the truth framing ($M = 74.5\%$, $SD = 0.21$), than with the lie framing ($M = 53.1\%$, $SD = 0.24$).

When lying, a repeated measures ANOVA showed similar results. There was not a main effect of video recording, $F(1, 82) = 1.02$, $p = 0.32$, $\eta^2 = 0.01$, nor was there a significant framing x recording interaction, $F(1, 82) = 0.36$, $p = 0.55$, $\eta^2 = 0.00$. Yet once again, framing had a significant impact on participants' predictions of their transparency, $F(1, 82) = 15.30$, $p < 0.00$, $\eta^2 = 0.16$, whereby, when participants lied and were presented with the lie frame, they predicted that 58.2% ($SD = 0.31$) would detect their lie, but when queried with the truth frame, the lie transparency prediction was 39.2% ($SD = 0.32$).

A repeated measures ANOVA was conducted with participants' predictions of how transparent they would be to ten hypothetical observers as the dependent variable to examine the degree to which statement veracity, video recording (situational public self-awareness), and framing contributed to these predictions. The analysis revealed a main effect of veracity, $F(1, 76) = 6.92$, $p = 0.01$, $\eta^2 = 0.08$, whereby participants predicted that more hypothetical observers would determine their veracity correctly when they were telling the truth ($M = 6.15$, $SD = 2.17$) than when they lied ($M = 5.04$, $SD = 2.12$). There was not a main effect for video recording, $F(1, 76) = 2.46$, $p = 0.12$, $\eta^2 = 0.03$. There was not a significant main effect for framing, $F(1, 76) = 0.38$, $p = 0.54$, $\eta^2 = 0.01$. No significant interactions between the variables were revealed.

Truth/Deception Detection

Overall, the other adult players were 55% accurate ($SD = 0.16$) in determining veracity. They were 56.4% accurate ($SD = 0.18$) accurate in determining veracity for true statements and 53.4% ($SD = 0.23$) accurate at detecting other's lies.

The difference between truth and lie detection accuracy was not statistically significant, $t(87) = 1.03, p = 0.31, d = 0.14, 95\% \text{ CI } [0.11, 0.17]$. Accuracy in detecting truths was significantly greater than chance, $t(89) = 3.36, p = 0.001$, while accurate detection of lies was not significantly different from chance, $t(88) = 1.40, p = 0.17$, demonstrating that the adults' true statements were relatively more detectable and thus, more transparent, than their false statements.

A repeated measures ANOVA was conducted to examine how statement veracity, video recording, and framing impacted veracity identification accuracy. The analysis revealed no main effects of veracity, $F(1, 76) = 0.89, p = 0.35, \eta^2 = 0.01$, video recording, $F(1, 76) = 0.06, p = 0.80, \eta^2 = 0.01$, or framing, $F(1, 76) = 0.06, p = 0.82, \eta^2 = 0.00$, as well as no significant interactions. The manipulated variables impacted predictions of transparency, but not actual transparency.

To examine if there was a perceiver bias, the percentages of truth and lie judgments were compared. Overall, participant-observers judged 51.4% ($SD = 0.13$) of all statements as truths and 48.6% ($SD = 0.13$) as lies. The difference between the rates was not statistically significant, $t(90) = 0.97, p = 0.34$. When mock-video recorded, the percentages of statements judged as truths (53.1%) or lies (46.9%) did not differ significantly, $t(90) = 1.35, p = 0.18$. One-way ANOVAs did not reveal a significant difference in veracity judgments as a function of framing, $F(1, 89) = 1.11, p = 0.29$ (results were the same for both veracity judgments). Once again, it does not appear that there was a perceiver bias when judging veracity.

The Illusion of Transparency

The means of participants' predictions of transparency were compared to their actual transparency to determine if an illusion of transparency was observed. For truths, the difference

between predicted transparency (63.5%) and actual transparency (56.4%) was statistically significant, $t(89) = 2.41$, $p = 0.02$, $d = 0.33$, 95% CI [0.30, 0.36]. For lies, the difference between predicted transparency (48.4%) and actual transparency (53.4%) was not significant, $t(88) = -1.48$, $p = 0.14$, $d = -0.21$, 95% CI [-0.25, -0.18]. Once again, participants demonstrated an illusion of transparency when telling the truth, over-predicting the transparency of their statements by 7.3%, however, for lies, participants did not show an illusion of transparency, under-predicting the transparency of their false statements by 7.4%. A paired-samples t -test showed that the difference between the illusion of transparency for truths and lies was significant, $t(83) = 2.68$, $p = 0.01$, $d = 0.44$, 95% CI [0.39, 0.49], demonstrating that participants did experience an illusion of transparency when truthful, but not when lying. Therefore, Hypothesis 1 was partially supported; an illusion of transparency was observed for truthful but not deceptive statements.

An illusion of transparency score was computed for each statement by subtracting the percent of observers who judged the statement accurately from participants' predicted transparency score. To investigate how veracity, video recording, and framing impact the illusion of transparency, a repeated measures ANOVA was conducted with the illusion of transparency score as the dependent measure. Results revealed a main effect of veracity, $F(1, 76) = 6.69$, $p = 0.01$, $\eta^2 = 0.08$, such that participants experienced more of an illusion of transparency when they told the truth ($M = 0.08$, $SD = 0.26$) than when they lied ($M = -0.06$, $SD = 0.39$), again partially supporting Hypothesis 1. There was a marginal main effect of video recording, $F(1, 76) = 3.52$, $p = 0.07$, $\eta^2 = 0.04$, however this effect was contrary to what was predicted. Participants had less of an illusion of transparency when mock video recorded. Hypothesis 2 was not supported with these data. There was no main effect of framing, $F(1, 76) = 0.20$, $p = 0.66$, $\eta^2 = 0.00$, however

there was a significant veracity x framing interaction, $F(1, 76) = 12.29, p = 0.001, \eta^2 = 0.14$, whereby participants telling the truth experienced a greater level of the illusion of transparency when queried with the truth frame ($M = 0.18, SD = 0.37$) than when queried with the lie frame ($M = -0.03, SD = 0.34$), but when lying, participants presented with the lie frame experienced a greater level of the illusion of transparency ($M = 0.02, SD = 0.52$) than those who were presented with the truth frame ($M = -0.14, SD = 0.57$). Thus, Hypothesis 4 was supported (see Figure 3).

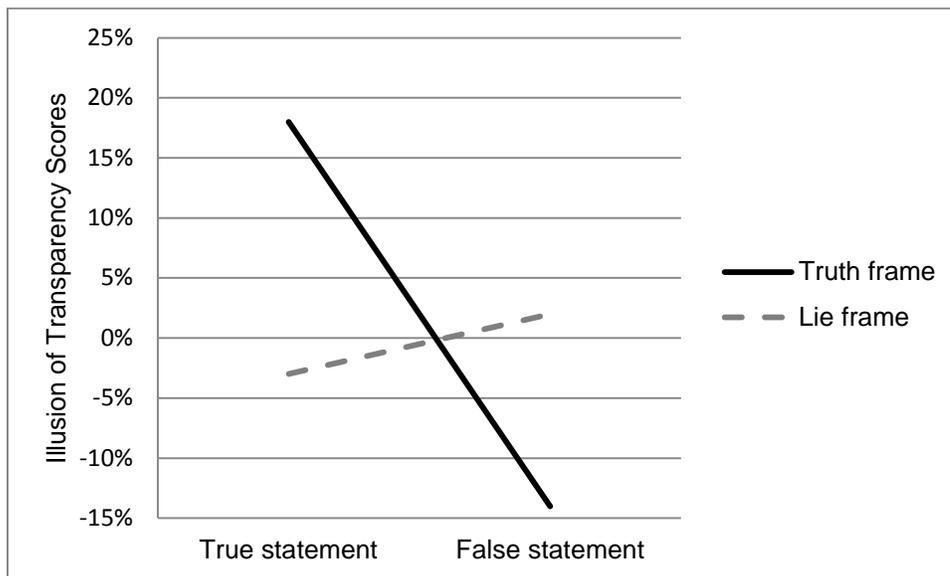


Figure 3. Illusion of transparency scores (difference between predicted and actual transparency) as a function of statement veracity and question framing (Study 2).

Self-Consciousness

To assess the relationship between dispositional self-consciousness and the illusion of transparency, the total self-consciousness score and the scores on each of the three subscales (private, public, social anxiety) were correlated with participants' illusion of transparency scores

as well as their predictions of transparency. Hypothesis 3 was not supported as overall self-consciousness scores was not related to the illusion of transparency, however, the public self-consciousness subscale was correlated with predictions of believability when telling the truth, $r(89) = 0.27, p < 0.01$. Predictions of lie detectability were not correlated with any of the self-consciousness scales (see Table 2 for all correlations).

Table 2

Pearson's Product Moment Correlations (and Two-Tailed Significance Levels) for Dispositional Self-Consciousness with Predictions of Transparency and the Illusion of Transparency (Study 2)

Self-Consciousness Scale	Feelings of Transparency					Illusion of Transparency				
	Truth (n = 90)	Lie (n = 89)	Video (n = 91)	No Video (n = 91)	Overall (n = 91)	Truth (n = 90)	Lie (n = 85)	Video (n = 91)	No Video (n = 91)	Overall (n = 91)
Private SC	.015 (.886)	-.045 (.674)	.066 (.537)	-.048 (.651)	.000 (.999)	-.058 (.589)	.072 (.511)	.077 (.468)	.002 (.987)	.049 (.645)
Public SC	.273** (.009)	-.150 (.161)	.095 (.370)	.099 (.349)	.127 (.230)	.140 (.188)	-.111 (.314)	.003 (.976)	.036 (.735)	.020 (.852)
Social Anxiety	.070 (.514)	-.020 (.850)	.053 (.619)	.030 (.781)	.046 (.662)	.076 (.477)	.035 (.750)	-.007 (.947)	.135 (.203)	.074 (.486)
Total SC	.150 (.158)	-.091 (.396)	.094 (.378)	.032 (.763)	.073 (.490)	.065 (.540)	.005 (.964)	.034 (.752)	.078 (.462)	.065 (.540)

Note. **= $p < .01$

Exploratory Analyses—Are You a Good Liar?

We asked all participants if they think they are good liars or not and 46.1% reported that they were good liars. We then explored if participants' assessments of their lying skills correlated with other factors, such as self-consciousness, feelings of transparency and detectability, and some differences were revealed. As in Study 1, a significant correlation was revealed between self-reported good liars and the social anxiety subscale of the Self-Consciousness Scale, $r(89) = -0.29, p < 0.01$, showing that participants who report being good liars may be less socially anxious than self-reported bad liars. Significant correlations were not observed for the other subscales.

There was also a significant correlation between reported lie-telling ability and the detection accuracy of observers, $r(89) = -0.30, p < 0.01$, demonstrating that participants appeared to have insight into their own abilities, as good liars were less detectable than bad liars. This correlation held for lie detection, $r(87) = -0.24, p = 0.03$, but not for truth detection, $r(88) = -0.18, p = 0.09$. Additionally, participants who reported being bad liars predicted that their true statements would be significantly more likely to be believed by observers, $r(88) = -0.27, p = 0.01$.

Children and Adults

To gain a more complete understanding of the illusion of transparency, the data from Studies 1 and 2 were merged and analyses were conducted looking at both groups of participants together. A repeated measures ANOVA was conducted with the difference between predicted transparency and actual transparency (i.e., the illusion scores) as the dependent measure and statement veracity and public self-awareness as the independent (repeated) factors. Contrary to expectations, there was not a significant difference in the illusion of transparency between the

adult sample and the child and adolescent samples, $F(1, 103) = 0.09, p = 0.77, \eta^2 = 0.01$. Yet, the results revealed many of the same effects observed in the individual studies. There was a main effect of veracity, $F(1, 103) = 8.95, p = 0.003, \eta^2 = 0.08$, such that participants experienced more of an illusion of transparency when they told the truth than when they lied. There was no main effect of framing, $F(1, 103) = 0.96, p = 0.33, \eta^2 = 0.01$, however there was a significant veracity x framing interaction, $F(1, 103) = 10.87, p = 0.001, \eta^2 = 0.10$, whereby participants telling the truth experienced a greater level of illusion of transparency when queried with the truth frame ($M = 19.7\%, SD = 0.44$) than when queried with the lie frame ($M = -1.4\%, SD = 0.40$), but when lying, participants presented with the lie frame experienced a greater level of the illusion of transparency ($M = 0.1\%, SD = 0.55$) than those who were presented with the truth frame ($M = -11.2\%, SD = 0.61$) (see Figure 4).

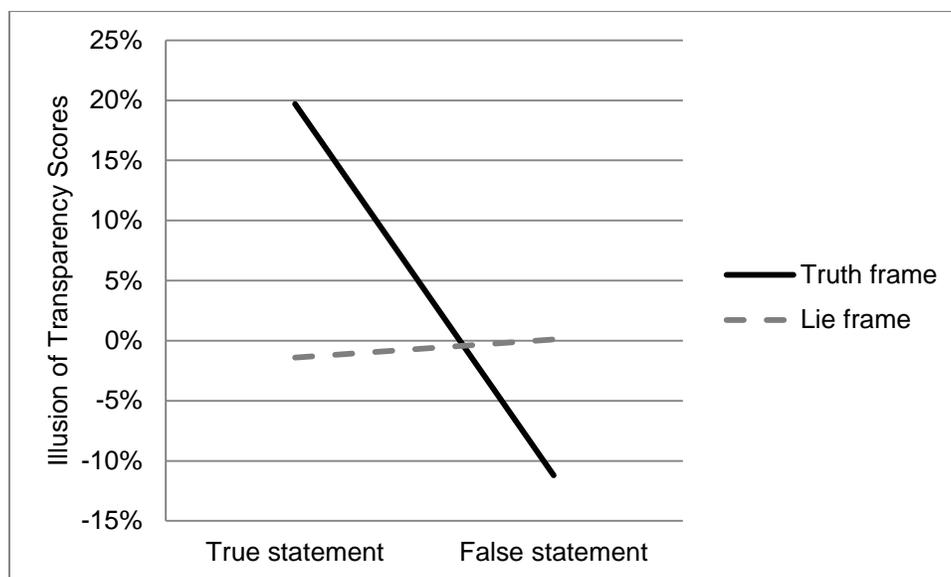


Figure 4. Illusion of transparency scores (difference between predicted and actual transparency) for the combined sample of children and adults as a function of statement veracity and question framing (Studies 1 and 2).

The video recording self-awareness manipulation did not have a main effect on illusion of transparency scores, $F(1, 103) = 2.56, p = 0.11, \eta^2 = 0.02$, but there was a significant sample x video recording interaction, $F(1, 103) = 12.25, p = 0.001, \eta^2 = 0.11$, such that adults and children were differently impacted by the self-awareness manipulation. When the children and adolescents were told they were being recorded, the illusion of transparency was greater ($M = 11.3\%, SD = 0.56$) than when they were not ($M = -6.3\%, SD = 0.51$). For adult participants, their illusion of transparency scores were greater when they were not being recorded ($M = 4.4\%, SD = 0.34$) than when they thought they were being videotaped ($M = -2.2\%, SD = 0.31$) (see Figure 5). An independent samples t -test revealed a significant difference in the illusion of transparency between the two samples when they believed they were being videotaped, $t(123) = 2.10, p = 0.04, d = 0.43, 95\% CI [0.37, 0.48]$.

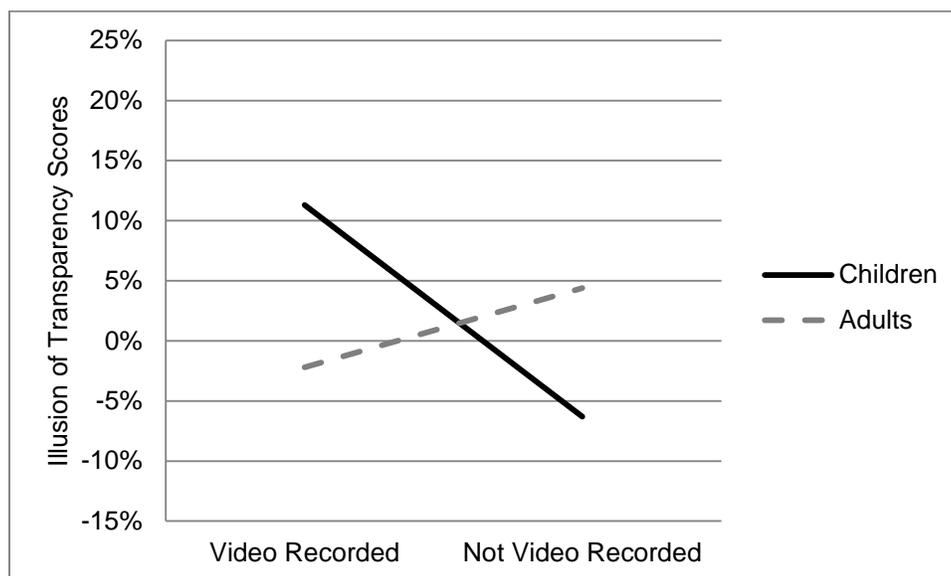


Figure 5. Illusion of transparency scores for children and adults when they believed they were being video recorded or not video recorded when speaking.

Discussion

The current study was intended to replicate Study 1 using a larger sample of adults. It was predicted that participants would feel an illusion of transparency for both truthful and deceptive statements. However, again, an illusion of transparency was only observed for truthful statements, partially supporting Hypothesis 1 and running counter to Gilovich et al. (1998), in which the illusion of transparency was only observed for liars. Participants were more likely to predict that their truths would be believed than their lies detected. This significant difference was driven by a veracity by framing interaction, supporting Hypothesis 4. Participants predicted a higher degree of transparency when telling the truth and presented with the truth frame than with the lie frame. However, when presented with the lie frame, they predicted more lie transparency than truth transparency. As mentioned earlier, framing can impact decision making, even when the frames are fundamentally identical. Individuals made their transparency predictions in line with how the question was framed when their veracity was congruent to the frame, but not when their veracity was incongruent to the question framing. As described by Frisch (1993), though the two framing conditions were formally equivalent, there is a difference in the emotional consequences of having one's truths believed or lies detected. As stated earlier, positive descriptions triggered higher rates of positive responses in many of the framing studies (Levin, 1987; McNeil et al., 1982; Duchon et al., 1989), and a similar effect of framing was observed here. Research has also demonstrated that the impact of these effects is strongest when the stimuli are salient and the context is vague (Wright, 1991). Asking people to predict the number of others who will think they are telling the truth when the participant is truthful makes *truthfulness* more salient and when asked to predict the number of observers who will judge a statement as a lie when the participant is *lying* makes lying more salient.

Similar to our younger participants in Study 1, when lying, the manipulations of self-awareness and framing did not impact adults' predictions of transparency. In contrast, when truthful, framing did significantly impact predictions of truth transparency. Participants estimated themselves to be most transparent when telling the truth and questioned with the truth frame.

Also in line with previous research (i.e., Bond & DePaulo, 2006), participants were 55% accurate at determining the veracity of the statements made by the other players. Our manipulated variables did not impact the truth/deception detection accuracy of participants, demonstrating that the framing and self-awareness manipulations did not have an effect on the actual transparency of the participants' statements.

Nevertheless, participants experienced an illusion of transparency when telling the truth but not when lying, driven by their feelings of transparency, as observers' accuracy was similar in detecting truths and lies. Mimicking the results from Study 1, participants experienced the greatest degree of an illusion of transparency when telling the truth and questioned with the truth frame. However, unlike the child and adolescent participants, the manipulation of public self-awareness did not impact transparency predictions. Hypothesis 2 was not supported with these data, as there was a marginal main effect of the self-awareness manipulation, but it was contrary to what was hypothesized. It is possible that the presence of the video camera increased self-awareness simply by being in the room, whether it was on or off. It is also possible that undergraduate students, with more experience participating in psychology research, were more suspicious of the camera manipulation, assuming deception on the part of the experimenter. The surprising finding that the impact of the self-awareness manipulation did not replicate led to a further investigation of self-awareness in Study 3.

It was also hypothesized that participants with higher trait self-consciousness scores would feel more transparent when lying and telling the truth than participants with lower levels of self-consciousness, but this prediction was only partially supported. Participants with higher levels of public self-consciousness were more likely to predict that their true statements would be believed, but this relationship was not observed for predictions of lie transparency. The private self-consciousness and social anxiety subscales of the Self-Consciousness Scale were unrelated to predictions of transparency or statement veracity detectability. All self-consciousness subscales were unrelated to the illusion of transparency. This finding was also unexpected and may have been the result of the experimental procedures. The Self-Consciousness Scale was completed at the end of the study after participants made statements in front of an audience and thought they were being videotaped. These manipulations may have made all participants feel more self-conscious. Future studies will vary the timing of this questionnaire, however, for these studies we did not want participants to think about their self-consciousness before making their statements as it may have artificially impacted the results.

The combined child and adult data demonstrated that participant age did not have a direct effect on the illusion of transparency. However, it was observed that the lies told by the youngest participants were more accurately discriminated by observers than the lies told by older children or adults. This finding supports previous research that has demonstrated that younger children have difficulty not giving themselves away when lying (Talwar & Lee, 2002a). It is possible that the younger participants have less of an understanding of what is necessary to lie effectively. They may have displayed more nervousness and/or greater cognitive effort than older children or adult participants when lying because they were not engaging in self-presentation techniques or

suppressing these cues like older children and adults would (Vrij, Akehurst, Brown, & Mann, 2006).

The conclusions that can be drawn from this study are that an illusion of transparency exists when truth-telling, regardless of participant age, and that question framing has a significant impact on predictions of transparency. When participants were asked to estimate the number of others that would deem their statements as truthful, there was a much larger difference between veracity conditions than when asked to predict the number of others who would determine that the statement was a lie. Two surprising findings led to Study 3. First, the illusion of transparency was not observed when participants lied and, second, adult participants did not experience a greater degree of the illusion of transparency when made publically self-aware. Study 3 replicated the veracity manipulation in order to continue to investigate the illusion among participants when both lying and truth-telling, while delving deeper into the relationship between self-awareness and the illusion of transparency.

CHAPTER 10: STUDY 3

The goal of Study 3 was to examine the impact of situational manipulations of self-awareness on the illusion of transparency more comprehensively. Though this study included the majority of the same variables, procedures, and materials as the previous studies, the self-awareness manipulation was altered to a between-subjects design and included one of the following: a mirror (private self-awareness), a video camera (public self-awareness), or a painting (control).

The purposes of this study were to replicate many aspects of the previous study, to assess the generalizability of the findings, to explore situational private self-awareness, and to correct possible limitations of the situational public self-awareness manipulation in the previous study. It was possible that just having the camera in the room and salient was enough to increase situational public self-awareness. The following results were hypothesized:

- (1) The illusion of transparency would be observed for both truthful and deceptive statements.
 - (2) Participants would feel more transparent when situationally self-aware. Either the presence of a mirror (private self-awareness) or a video camera (public self-awareness) would increase feelings of transparency compared to the control (painting) condition.
 - (3) Participants with higher trait self-consciousness scores would feel more transparent when lying and telling the truth than participants with lower levels of self-consciousness.
- The study continued to explore potential relationships between the private, public, and social anxiety subscales of the Self-Consciousness Scale and the illusion of transparency, but it was predicted that all would increase feelings of transparency.

(4) When the question was framed as, “How many of the other players will believe you are telling the truth?” we would see an increase in predictions of transparency among truth-tellers; when it was framed as, “How many will think you're lying?” we would see an increase in predictions of transparency among liars.

Method

Participants

Participants were 135⁵ undergraduate psychology students between the ages of 18 and 46 years (38 males; $M_{age} = 20.8$ years, $SD = 4.3$) from the John Jay College Psychology Department Research Experience Program subject pool. Participants were from diverse self-reported backgrounds, including 54 Hispanic-American, 19 Anglo-American, 24 African-American, and 10 Asian-American participants, as well as 28 participants from mixed/multiple backgrounds. All participants received course credit for participating.

Design

The design for Study 3 was a 2(statement veracity: lie, truth) X 2(self-awareness induction: mirror, video camera, painting) X 2(post-statement framing: believe truth or detect lie) mixed factorial design in which veracity was a within-subjects variable and self-awareness induction and post-statement framing were between-subjects variables.

⁵ A power analysis using G*Power indicated statistical power of at least 0.99 for the sample of $n = 135$, for medium effect sizes, $\alpha = .05$ and $d = .5$, consistent with previously reported main effects. A sample size of $n = 120$ would be required to detect $d = 0.25$ effects, consistent with previously reported interaction effects.

Materials

All materials for Study 3 were identical to those for Study 2 except the self-awareness induction manipulation. Additional materials include a framed painting of the cover of the book, Charlotte's Web and a medium-sized mirror.

Procedure

The procedures for Study 3 were almost identical to those in Study 2, with a few exceptions. First, a cover story was needed to explain why participants should be looking at the mirror, painting or camera. Participants were told that in order to control for the impact of eye contact on veracity determinations, when speaking, they should not make eye contact with the other players. Rather, they should look straight ahead when making their statements. Depending on the condition, straight ahead of the participants was a medium-sized mirror, a video camera, or a painting. Adults participated in groups that ranged from 3–8 participants ($M = 4.7$, $SD = 1.5$).

As in the previous studies, the statements participants were asked to make were about real-life events that may or may not have happened to them in the past. As such, not all participants made statements in every condition. Two participants reported that all of the events on the LEI had occurred in their past, and therefore, made four true statements. Five participants told three truths and one lie. When participants made more than one statement in a condition, the prediction and detection scores were averaged.

Results

Feelings of Transparency

Overall, participants predicted that the other players would be 56.3% ($SD = 0.15$) accurate in determining veracity. Participants predicted that the other players would believe their

truthful statements 64.3% ($SD = 0.26$) of the time and detect their lies 48.3% ($SD = 0.25$) of the time. A paired-samples t -test revealed a significant difference between participants' predictions of their truth and lie transparency, $t(132) = 4.63, p < 0.00, d = 0.66, 95\% \text{ CI } [0.63, 0.69]$.

Predictions of truth transparency were significantly above chance, $t(134) = 6.48, p < 0.00$, but predictions of the transparency of lies were not significantly different from chance: $t(132) = 0.60, p = 0.43$, demonstrating that the participants were more likely to predict that their truths would be believed than their lies detected.

Participants were asked to imagine that ten adults were watching them make their statements and predict the transparency of each of their statements. When telling truthful statements, participants predicted that 6.2 of out 10 ($SD = 2.0$) hypothetical adults would believe them. When lying, participants predicted that 4.8 of out 10 ($SD = 2.0$) hypothetical adults would detect their lies. A paired-samples t -test revealed that the difference between hypothetical truth and lie detectability predictions was significant, $t(132) = 4.75, p < 0.00, d = 0.73, 95\% \text{ CI } [0.49, 0.96]$. The prediction of truth detection was significantly above chance, $t(134) = 7.12, p < 0.00$, but prediction of the detectability of lies was not significantly different from chance: $t(132) = 1.43, p = 0.16$, demonstrating that the participants' hypothetical predictions were similar to their real predictions, with adult participants more likely to predict that their truths would be believed than their lies detected.

Framing

Demonstrating the same pattern as the previous study, no significant differences in overall feelings of transparency were revealed between the two framing conditions, $t(133) = 0.19, p = 0.85, d = 0.03, 95\% \text{ CI } [0.01, 0.06]$, however, predictions of lie transparency were significantly different as a function of framing, $t(131) = 4.42, p < 0.00, d = 0.77, 95\% \text{ CI } [0.72,$

0.81], as were the differences in truth transparency predictions, $t(133) = 4.23, p < .000, d = 0.73$, 95% CI [0.69, 0.78].

When participants were queried with the lie frame, there were not significant differences between their predictions of the believability of their true statements ($M = 55.1\%$, $SD = 0.23$) and the predicted detectability of their lies ($M = 57.5\%$, $SD = 0.23$), $t(64) = 0.55, p = 0.58, d = 0.11$, 95% CI [0.07, 0.14]. However, when presented with the truth frame, the difference between their predictions of truths believed ($M = 74.0\%$, $SD = 0.24$) and their predictions of lies detected ($M = 39.5\%$, $SD = 0.24$) was significant, $t(67) = 7.40, p < .000, d = 1.44$, 95% CI [1.40, 1.48]. Participants were significantly more likely to predict that their true statements would be believed than their lies detected when questioned with the truth frame.

Situational Self-Awareness

To further examine the impact of situational self-awareness, participants in Study 3 were placed in one of three conditions. While speaking, participants either faced a camera (public self-awareness), a mirror (private self-awareness), or a painting (control). In the camera condition ($n = 44$), participants predicted that 66.1% ($SD = 0.26$) of their true statements would be believed and 49% ($SD = 0.26$) of their lie statements detected. In the mirror condition ($n = 48$), participants predicted that 68% ($SD = 0.22$) of their true statements would be believed and 46% ($SD = 0.24$) of their lie statements detected. In the painting condition ($n = 43$), participants predicted that 58.4% ($SD = 0.29$) of their true statements would be believed and 50.2% ($SD = 0.26$) of their lie statements detected. A one-way ANOVA did not reveal any significant differences in predictions of transparency when lying, $F(2, 130) = 0.33, p = 0.72$, or telling the truth, $F(2, 132) = 1.74, p = 0.18$, as a function of the self-awareness manipulation.

Participants' predictions of their transparency for ten hypothetical observers were examined as a function of the self-awareness manipulation. When lying, participants predicted that 4.4 ($SD = 2.17$) hypothetical observers would detect their lies in the mirror condition, 4.9 ($SD = 1.86$) would detect their lies in the camera condition, and 5.0 ($SD = 1.97$) would detect their lies in the control (picture) condition. When truthful, participants predicted that 6.4 ($SD = 1.91$) hypothetical observers would believe their true statements in the mirror condition, 6.2 ($SD = 1.99$) would believe their true statements the camera condition, and 6.0 ($SD = 2.13$) would believe their true statements in the control (picture) condition. One-way ANOVAs did not reveal any significant differences in predictions of transparency when lying, $F(2, 130) = 1.00, p = 0.37$, or telling the truth, $F(2, 132) = 0.35, p = 0.71$ as a function of the self-awareness manipulation.

To examine the degree to which statement veracity, framing, and the self-awareness manipulation contributed to feelings of transparency, we conducted a repeated measures ANOVA in which predictions of transparency was the dependent variable. There was a main effect of veracity, $F(1, 127) = 27.60, p < 0.00, \eta^2 = 0.18$, such that participants predicted more transparency when they were truthful ($M = 64.8\%, SD = 0.23$) than when they were lying ($M = 48.2\%, SD = 0.24$). The analysis did not reveal a significant main effect of framing, $F(1, 127) = 0.25, p = 0.62, \eta^2 = 0.00$, however there was a significant veracity by framing interaction, $F(1, 127) = 36.92, p < 0.00, \eta^2 = 0.23$. When telling the truth, participants queried with the truth frame predicted that 75.1% ($SD = 0.33$) of observers would believe them, but when queried with the lie frame, the percentage was 54.6% ($SD = 0.32$). When lying and predicting transparency, participants predicted 57.2% ($SD = 0.33$) would detect their lies when presented with the lie frame and 39.1% ($SD = 0.34$) when presented with the truth frame (see Figure 6). There was not a significant effect of the situational self-awareness manipulation on predictions of transparency

when truthful, $F(2, 127) = 0.35, p = 0.71, \eta^2 = 0.01$, nor were any other interactions significant. Hypothesis 2 was not supported, as participants did not report greater feelings of transparency as a function of the self-awareness manipulation.

A repeated measures ANOVA was conducted with participants' predictions of how transparent they would be to ten hypothetical observers as the dependent variable to examine the degree to which statement veracity, situational self-awareness, and framing contributed to their predictions. The analysis revealed a main effect of veracity, $F(1, 76) = 6.92, p = 0.01, \eta^2 = 0.08$, whereby participants predicted that more hypothetical observers would determine their veracity correctly when they were telling the truth ($M = 6.15, SD = 2.17$) than when they lied ($M = 5.04, SD = 2.12$). There was not a main effect for video recording, $F(1, 76) = 2.46, p = 0.12, \eta^2 = 0.03$. There was not a significant main effect for framing, $F(1, 76) = 0.38, p = 0.54, \eta^2 = 0.01$. No significant interactions between the variables were revealed.

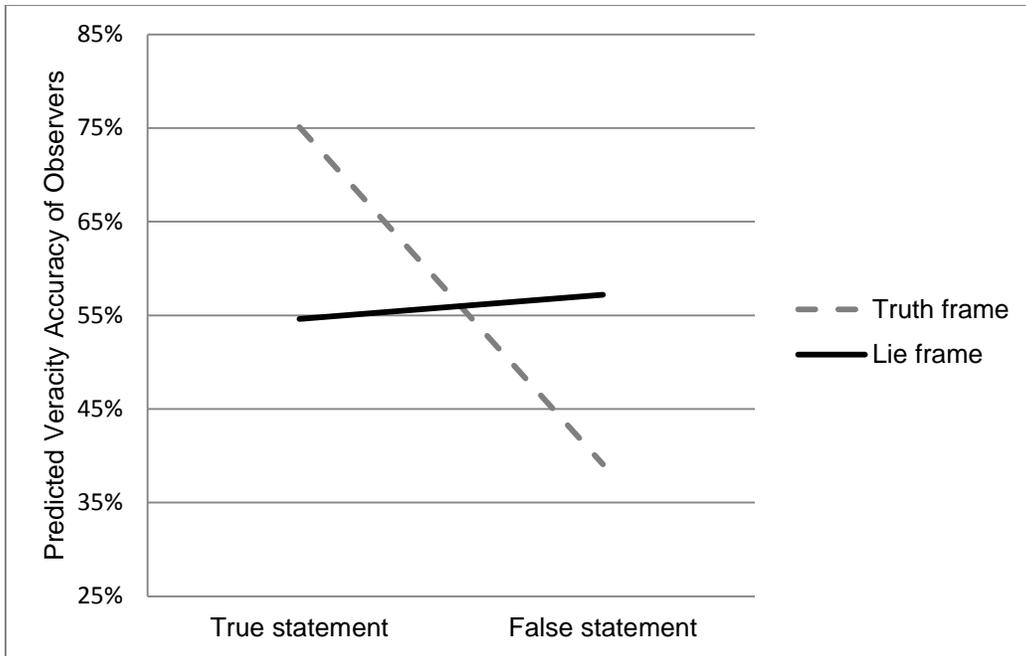


Figure 6. Speakers' predicted transparency percentage as a function of statement veracity and question framing (Study 3)

Truth/Deception Detection

Overall, the other adult players were 56.7% accurate ($SD = 0.19$) in determining veracity. They were 57.2% ($SD = 0.22$) accurate in determining veracity for true statements and 56.5% ($SD = 0.26$) accurate at detecting other's lies. A paired-samples t -test showed that the difference between truth and lie detection accuracy was not statistically significant, $t(133) = 0.24$, $p = 0.81$, $d = 0.03$, 95% CI [0.00, 0.06]. Participants demonstrated some actual transparency, as both accuracy in detecting truths, $t(134) = 3.71$, $p < 0.001$, and lies, $t(132) = 2.90$, $p < 0.01$, were greater than chance.

A repeated measures ANOVA was conducted to examine how statement veracity, the self-awareness manipulation, and framing impacted veracity identification accuracy. The

analysis revealed no main effects of veracity, $F(1, 127) = 0.10, p = 0.75, \eta^2 = 0.00$, self-awareness manipulation, $F(1, 127) = 2.22, p = 0.11, \eta^2 = 0.03$, or framing, $F(1, 127) = 0.01, p = 0.95, \eta^2 = 0.00$. However, there was a significant interaction between framing and veracity on veracity detection accuracy, $F(1, 127) = 4.97, p = 0.03, \eta^2 = 0.04$. When speakers were presented with the truth frame, observers were more accurate at identifying truths ($M = 60.4\%, SD = 0.32$) than lies ($M = 53.8\%, SD = 0.37$), however, when speakers were presented with the lie frame, observers were more accurate at identifying lies ($M = 59.3\%, SD = 0.36$) than truths ($M = 54.4\%, SD = 0.31$) (see Figure 7).

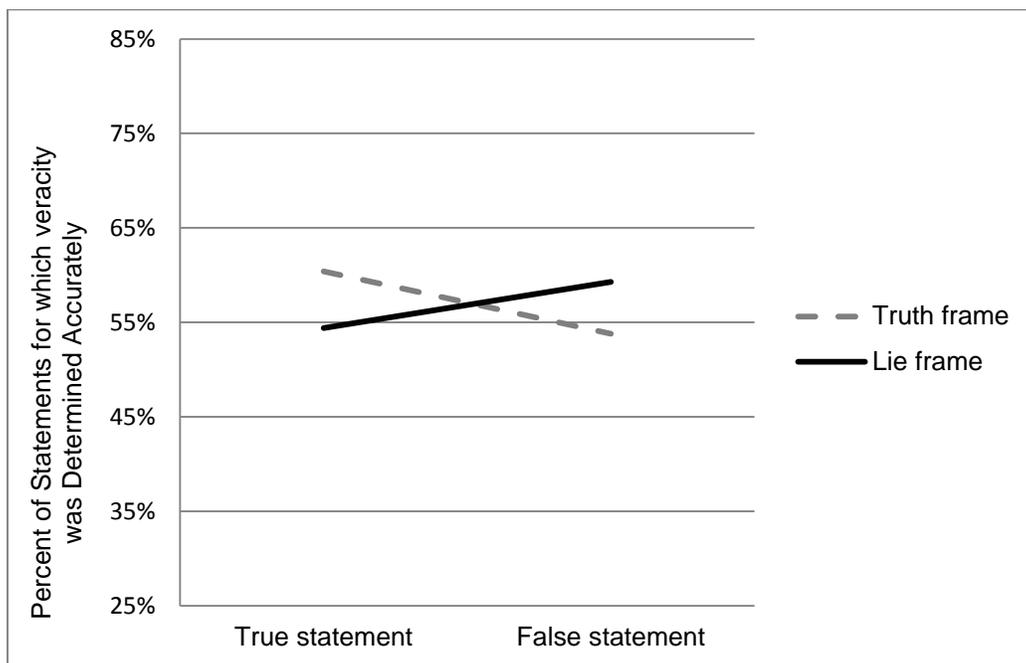


Figure 7. Percentage of other players who accurately determined the veracity of true and false statements as a function of statement veracity and question framing (Study 3)

To examine if there was a perceiver bias, the percentages of truth and lie judgments were compared. Overall, participant-observers judged 54.5% ($SD = 0.23$) of all statements as truths and 45.6% ($SD = 0.23$) as lies. This difference was statistically significant, $t(90) = 3.19, p < 0.01$; participants were more likely to judge statements as truths than as lies, demonstrating a truth bias. One-way ANOVAs did not reveal significant differences in the percentage of statements that were judged as truth, $F(2, 276) = 0.19, p = 0.83$, or as lies, $F(2, 276) = 0.09, p = 0.91$, as a function of the self-awareness induction condition.

There was also a significant difference in veracity judgments as a function of framing. Statements were more likely to be judged as truths in the truth frame condition (60.2%, $SD = 0.23$) than in the lie frame condition (49.2%, $SD = 0.23$). This difference was statistically significant, $t(277) = 4.02, p < 0.01$. Statements were more likely to be judged as lies in the lie frame condition (51.2%, $SD = 0.23$) than in the truth frame condition (39.8%, $SD = 0.23$). This difference was also statistically significant, $t(277) = 4.15, p < 0.01$.

The Illusion of Transparency

The means of participants' predictions of transparency were compared to their actual transparency to determine if an illusion of transparency was observed. For truths, the difference between predicted transparency (64.3%) and actual transparency (57.2%) was statistically significant, $t(134) = 2.55, p = 0.01, d = 0.30, 95\% \text{ CI } [0.27, 0.33]$. For lies, the difference between predicted transparency (48.3%) and actual transparency (56.5%) was also significant, $t(132) = -2.71, p < 0.01, d = -0.32, 95\% \text{ CI } [-0.35, -0.29]$, however it was in the opposite direction as predicted, demonstrating not an illusion of transparency but a significant illusion of "opaqueness." Participants demonstrated an illusion of transparency when telling the truth, over-predicting the transparency of their statements by 7.2% ($SD = 0.33$). However, for lies,

participants did not show an illusion of transparency, under-predicting the transparency of their false statements by 8.2% ($SD = 0.35$). A paired-samples t -test showed that the difference between the illusion of transparency for truths and lies was significant, $t(132) = 3.70$, $p < 0.001$, $d = 0.48$, 95% CI [0.44, 0.52]. Thus, Hypothesis 1 was partially supported, once again, as participants did experience an illusion of transparency when truthful but not when lying.

An illusion of transparency score was computed for each statement by subtracting the percent of observers who judged the statement accurately from participants' predicted transparency score. To investigate how veracity, the self-awareness manipulation, and framing impacted the illusion of transparency, a repeated measures ANOVA was conducted with the illusion of transparency scores as the dependent measure. Results revealed a main effect of veracity, $F(1, 127) = 14.60$, $p < 0.001$, $\eta^2 = 0.10$, such that participants experienced more of an illusion of transparency when they told the truth than when they lied. The main effect of the self-awareness manipulation was marginally significant, $F(1, 127) = 2.49$, $p = 0.087$, $\eta^2 = 0.04$. Bonferroni post hoc pairwise comparisons revealed a marginally significant mean difference, $p = 0.096$, for the illusion of transparency between participants who spoke in front of a mirror ($M = 0.04$, $SD = 0.38$) and the control group who spoke in front of a picture ($M = -0.07$, $SD = 0.39$). The illusion of transparency scores for the participants who spoke in front of a video camera did not differ significantly from either of the other groups. Delving into this difference deeper, one-way ANOVAs with illusion of transparency scores for truths and lies as separate dependent variables revealed that the self-awareness manipulation impacted illusion of transparency scores when participants were telling the truth and predicting truth transparency, $F(1, 132) = 4.01$, $p = 0.02$, $\eta^2 = 0.06$, but not when lying and predicting lie transparency, $F(1, 132) = 0.13$, $p = 0.88$, $\eta^2 = 0.00$ (see Figure 8).

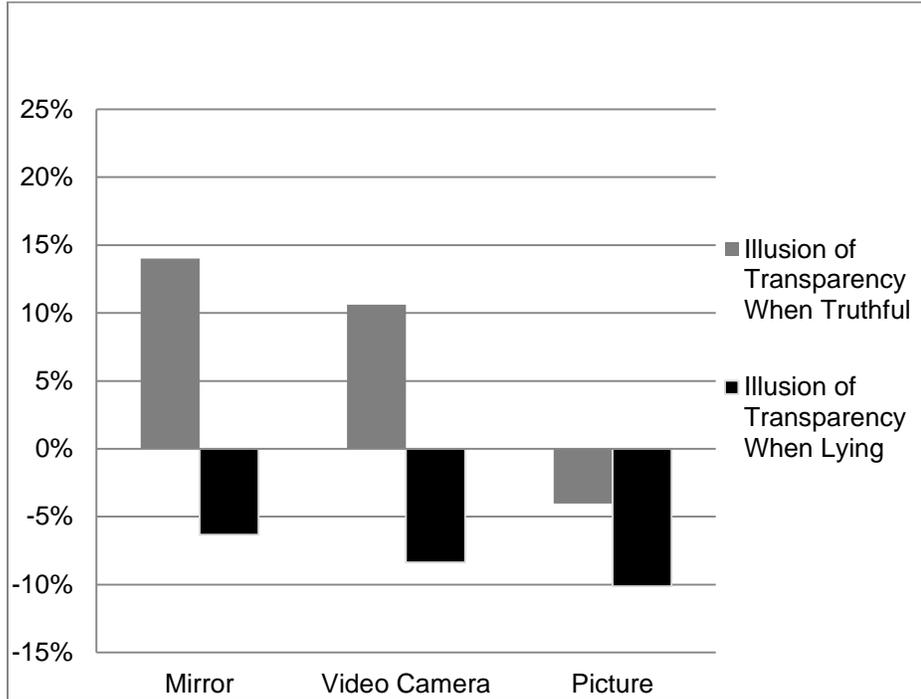


Figure 8. Illusion of transparency score as a function of the situational self-awareness manipulation and statement veracity (Study 3). Y-axis represents the percent difference between predicted and actual transparency.

There was no main effect of framing, $F(1, 127) = 0.07, p = 0.79, \eta^2 = 0.00$, however there was a significant veracity by framing interaction, $F(1, 127) = 10.64, p = 0.001, \eta^2 = 0.08$, whereby participants telling the truth experienced a greater level of the illusion of transparency when queried with the truth frame ($M = 0.15, SD = 0.44$) than those who were lying ($M = -0.15, SD = 0.50$). But when queried with the lie frame, there was almost no difference in participants' level of the illusion of transparency when lying ($M = -0.02, SD = 0.48$) versus telling the truth ($M = 0.00, SD = 0.43$). Thus, Hypothesis 4 was, again, supported, as adults' illusion of transparency was impacted by a veracity by framing interaction.

Self-Consciousness

To assess the relationship between dispositional self-consciousness and feelings of transparency, the total self-consciousness score and the scores on each of the three subscales (private, public, social anxiety) were correlated with participants' predictions of the believability of their lies and the detectability of their truths. The only significant correlation found was a positive relationship between predictions of lie transparency and the social anxiety subscale, $r(131) = 0.18, p < 0.05$, demonstrating the people who are more socially anxious were more likely to think their lies would be detected. Overall predictions of truth transparency were not correlated with any of the self-consciousness scales. However, when the correlations were examined within each of the self-awareness manipulation conditions, a significant correlation was revealed between participants' predictions of the believability of their true statements and social anxiety, $r(131) = -0.37, p = 0.01$, among participants in the video recording condition. Participants with lower social anxiety scores were more likely to predict that their true statements would be believed when speaking in front of a video camera (see Table 3 for all correlations between feelings of transparency and self-consciousness).

Table 3

Pearson's Product Moment Correlations (and Two-Tailed Significance Levels) for Dispositional Self-Consciousness with Feelings of Transparency (Study 3)

	Feelings of Transparency													
	Mirror			Camera						Control (Picture)			Overall	
	Truth (n = 48)	Lie (n = 48)	All (n = 48)	Truth (n = 44)	Lie (n = 43)	All (n = 44)	Truth (n = 43)	Lie (n = 42)	All (n = 43)	Truth (n = 135)	Lie (n = 133)	All (n = 135)		
Private SC	.071 (.630)	-.192 (.191)	-.122 (.410)	-.140 (.366)	-.095 (.545)	-.223 (.145)	.094 (.551)	-.008 (.959)	.014 (.928)	-.011 (.899)	-.091 (.299)	-.109 (.208)		
Public SC	.182 (.216)	-.085 (.566)	.079 (.595)	-.167 (.278)	.007 (.964)	-.163 (.292)	.222 (.152)	.028 (.859)	.230 (.137)	.050 (.565)	-.015 (.861)	.037 (.673)		
Social Anxiety	-.083 (.576)	.280 (.054)	.165 (.264)	-.366* (.014)	.194 (.212)	-.176 (.254)	.195 (.211)	.070 (.660)	.272 (.078)	-.057 (.510)	.182* (.036)	.117 (.175)		
Total SC	.075 (.612)	.011 (.943)	.060 (.687)	-.286 (.060)	.041 (.795)	-.242 (.113)	.225 (.146)	.041 (.795)	.231 (.136)	-.010 (.904)	.037 (.672)	.021 (.807)		

Note. * = $p < .05$.

Correlations were then explored between self-consciousness scores and the illusion of transparency scores. Strong relationships were revealed between the illusion of transparency and social anxiety. Higher social anxiety scores were correlated with a greater degree of the illusion of transparency when lying, $r(131) = 0.23$, $p < 0.01$, and a lesser degree when telling the truth, $r(133) = -0.23$, $p < 0.01$.

The correlations were then examined among each of the self-awareness manipulation conditions. Across all conditions, private self-consciousness was not correlated with any of the dependent measures. Public self-consciousness was positively correlated with illusion of transparency scores among those participants in the mirror condition of the self-awareness

manipulation, $r(46) = 0.30, p = 0.04$. Among the participants in the video camera condition, a strong negative correlation between the illusion of transparency for true statements and social anxiety was revealed, $r(46) = -0.48, p = 0.001$, whereby less socially anxious participants felt more of an illusion of transparency when telling the truth when they believed they were being recorded. Also among the participants in the video camera conditions, significant negative correlations were revealed between their total self-consciousness scores and the illusion of transparency for all statements, $r(42) = -0.30, p = 0.046$, and for true statements, $r(42) = -0.37, p = 0.015$, but not for lies, $r(42) = -0.04, p = 0.80$. Participants with lower self-consciousness scores demonstrated a greater illusion of transparency in this condition. A significant correlation was also observed between social anxiety and the detectability of truthful statements, $r(134) = 0.27, p = 0.002$. Truths were more accurately determined for more socially anxious participants. Overall, Hypothesis 3 was not supported. Participants with higher levels of self-consciousness did not report feeling more transparent. However social anxiety was correlated with feelings of transparency when lying and with truth transparency when videotaped. Illusion of transparency scores when both lying and telling the truth were also related to social anxiety scores. Higher social anxiety was associated with greater feelings of transparency when lying and reduced feelings of transparency when truthful (see Table 4 for all correlations between self-conscious and the illusion of transparency).

Table 4

Pearson's Product Moment Correlations (and Two-Tailed Significance Levels) for Dispositional Self-Consciousness with Illusions of Transparency (Study 3)

	Illusion of Transparency											
	Mirror			Camera			Control (Picture)			Overall		
	Truth (n = 48)	Lie (n = 48)	All (n = 48)	Truth (n = 44)	Lie (n = 43)	All (n = 44)	Truth (n = 43)	Lie (n = 42)	All (n = 43)	Truth (n = 135)	Lie (n = 133)	All (n = 135)
Private SC	.105 (.479)	.040 (.787)	.114 (.442)	-.210 (.171)	-.124 (.429)	-.245 (.109)	.157 (.315)	.065 (.682)	.113 (.471)	-.024 (.780)	-.013 (.884)	-.038 (.660)
Public SC	.133 (.367)	.233 (.111)	.297* (.040)	-.181 (.239)	-.069 (.661)	-.190 (.218)	.140 (.370)	.118 (.457)	.195 (.209)	-.010 (.910)	.074 (.396)	.054 (.537)
Social Anxiety	-.242 (.097)	.274 (.059)	.044 (.765)	-.476** (.001)	.111 (.479)	-.271 (.075)	.000 (.999)	.299 (.055)	.245 (.114)	-.229** (.007)	.227** (.009)	.019 (.829)
Total SC	-.014 (.927)	.269 (.064)	.215 (.142)	-.366* (.015)	-.041 (.796)	-.303* (.046)	.124 (.427)	.221 (.159)	.250 (.106)	-.125 (.150)	.133 (.127)	.015 (.867)

Note. *= $p < .05$, **= $p < .01$

Exploratory Analyses—Are You a Good Liar?

We asked all participants if they think they are good liars or not and 54.1% reported that they were good liars. We then explored if participants' assessments of their lying skills correlated with self-consciousness and feelings of transparency, and some differences were revealed. Once again, there was a significant correlation between adult participants who reported that they were good liars and scores on the social anxiety subscale, $r(135) = -0.26, p < 0.01$, showing that participants who reported being bad liars also reported being more socially anxious. Participants who reported that they were good liars had significantly lower scores on the social anxiety subscale ($M = 9.0, SD = 4.45$) than those who reported that they were not good liars (M

= 11.34, $SD = 4.55$), $t(133) = 3.05$, $p = 0.003$, $d = 0.53$, 95% CI [-0.22, 1.28]. Significant differences were not observed on the other subscales, but the correlation between self-reported good liars and their predictions of the transparency of their lies approached significance, $r(133) = -0.17$, $p = 0.056$, demonstrating that participants who had confidence in their lie-telling ability were less likely to predict that their lies would be detected. The correlation with participants' illusion of transparency scores when telling the truth was also significantly related to self-reported lie-telling ability, $r(135) = 0.17$, $p = 0.05$, whereby self-reported good liars felt more illusion of an illusion of transparency when telling the truth than self-reported bad liars.

Two other differences were observed between self-reported good and bad liars in this study. Good liars predicted that their lies would be detected 44.5% ($SD = 0.26$) of the time while bad liars reported that their lies would be detected 52.9% ($SD = 0.23$) of the time and this difference approached statistical significance, $t(131) = 1.93$, $p = 0.056$, $d = 0.34$, 95% CI [0.30, 0.38]. There was also a significant observed difference between the average numbers of hypothetical observers that participants estimated to be able to detect their lies. Self-reported bad liars predicted that 5.19 ($SD = 2.07$) of the hypothetical observers would detect their lies, while self-reported good liars estimated that 4.40 ($SD = 1.83$) would, $t(131) = 2.35$, $p = 0.02$, $d = 0.34$, 95% CI [0.30, 0.38]. Though predictions of transparency differed between self-reported good and bad liars, unlike the previous two studies, lies told by bad liars in this study were not more detectable than lies told by good liars.

Discussion

The purpose of this third study was to delve deeper into the impact of situational self-awareness on the illusion of transparency, while replicating the framing and veracity manipulations from the prior two studies. It was again predicted that an illusion of transparency

would be observed for both truthful and deceptive statements, and once again this phenomenon was only observed for true statements. In fact, among the participants in study 3, a significant ‘illusion of opaqueness’ was observed. Participants significantly predicted that their false statements would be less detectable than they actually were. The veracity by framing interaction was again observed, whereby participants making truthful statements and queried with the truth frame predicted the highest degree of transparency.

Unlike the previous two studies, there appeared to be an impact of the manipulated variables on detection accuracy in this study. Participants were more accurate at identifying truths when the speaker’s question was presented with the truth frame, and more accurate at identifying lies when the speaker’s questions were posed in the lie frame. This is an unexpected finding because the observers did not have access to the framing manipulation, as it was only presented to the speaker. It is possible that the frame impacted participants’ behaviors and should be investigated further. When truthful and presented with the truth frame participants may have demonstrated fewer cues to deception, such as nervousness, than when presented with the lie frame. Asking people to estimate the number of people who would think they were lying may have made lying more salient and caused participants to exhibit different cues. When participants told the truth and were questioned with the truth frame, they may have appeared more credible because they did not have to think about lying or being misidentified at all. When telling the truth and queried with the lie frame, participants may have imagined what they may have done or said that would cause others to misidentify them as a liar, causing a different emotional response from the speaker that was observed by the other players. Previous research has shown that undesirable traits impact impressions more than desirable ones (Hamilton & Huffman, 1971) and that people spend more time thinking and reasoning about bad events than good ones

(Baumeister et al., 2001). Being misidentified as a liar could be considered a bad event and participants may have taken more time to respond or engaged in more effortful processing when presented with a frame incongruous to their veracity, particularly when it was negative.

As observed in the previous studies, the impact of statement veracity and the veracity by framing interaction was replicated in this study. Participants had a more prevalent illusion of transparency when truthful and this difference was magnified by the framing manipulation. This finding was consistent throughout all three studies and may be a result of the salience of the stimuli. When participants told the truth and were asked to report the number of others who would “see” their truthfulness, truth was salient, but when lying and presented with the truth frame, predictions were reduced because truthfulness was less salient. It is also possible that the framing by veracity interaction is a result of acquiescence, whereby people have a tendency to agree or disagree with items on surveys regardless of the content (Ray, 1983). When telling the truth, people might have simply thought others would also think they were truthful, but when the question was posed in the lie frame, their tendency to agree with the questionnaire may have reduced their estimates of the transparency of their truths. This may explain why the impact of truth framing was greater than lie framing. Research has shown that negatively valenced items are less susceptible to acquiescence than positively worded items (Tellis & Chandrasekaran, 2010).

The self-awareness manipulation showed a marginal effect on the illusion of transparency. Participants who made their statements in front of a mirror (private self-awareness) appeared to experience a greater degree of the illusion of transparency when truthful than the control group, but neither group differed significantly from the video camera group. It was predicted that both the public and private self-awareness manipulations would increase feelings

of transparency for both truthful and deceptive statements; therefore Hypothesis 2 was partially supported. It is possible that the presence of a mirror led participants to focus on their internal states to a greater degree than the other conditions, leading to an increased illusion of transparency, especially when truthful. However, it is unclear why the same effect was not observed when participants were lying. This line of research is ripe for future exploration.

The lack of impact of the video camera on the illusion of transparency was curious. It was expected that participants making their statements into a video camera would demonstrate increased feelings of transparency as a function of increased public self-awareness. As mentioned earlier, it is possible that participants did not believe they were actually being recorded or did not believe that their videos would be shown to others for future evaluation. It may also be that the experimental setting, in which participants had to stand and make statements in front of an audience of their peers, already made them feel high levels of self-awareness, creating a ceiling effect, therefore subsequent attempts to manipulate self-awareness were less impactful. A more substantial impact of the private self-awareness manipulation (mirror) was also predicted. Though participants were asked to look directly into the mirror when speaking, it is possible that they did not and instead focused on the wall around the mirror.

It was hypothesized that participants with higher trait self-consciousness scores would feel more transparent when lying and telling the truth than participants with lower levels of self-consciousness, but this prediction was only partially supported. Participants with higher levels of social anxiety were more likely to predict that their false statements would be detected, but this relationship was not observed for predictions of truth transparency. More socially anxious participants demonstrated less confidence in their lie-telling ability. The only other significant correlation between feelings of transparency and self-consciousness was a negative relationship

between social anxiety and predictions of truth transparency among the participants in the video camera condition. The participants with lower social anxiety scores who spoke in front of a video camera were more likely to predict that their true statements would be accurately identified than participants with higher social anxiety scores. It is possible that the presence of the camera made individuals who are more socially anxious feel even more so, inflating their feelings of transparency.

Correlations between self-consciousness scores and illusion of transparency scores demonstrated a strong relationship between the illusion of transparency and social anxiety when both lying and telling the truth. When compared to participants with low social anxiety scores, participants with higher social anxiety scores experienced a greater degree of the illusion of transparency when lying and a lesser degree when telling the truth. An interpretation of this finding is that socially anxious individuals may be aware that they exhibit nonverbal cues to deception when lying, and therefore expect others to be able to detect their lies. However, the cues are non-diagnostic of lying, so actual transparency is unaffected, yielding a greater illusion of transparency. Yet, when telling the truth, the relationship between social anxiety and the illusion of transparency shifts in the opposite direction. It may be that people who are more socially anxious are less transparent when telling the truth, possibly because their social anxiety makes them look more nervous and it appears as though they are lying. Participants with high social anxiety may show cues or behaviors that look deceptive but are actually signs of anxiety.

CHAPTER 11: GENERAL DISCUSSION

The primary goals of this series of experiments were to examine the illusion of transparency among both truth-tellers and liars and to investigate developmental and other factors that may impact the prevalence of this interpersonal phenomenon. Through three replications of this paradigm, several findings were consistent. Contrary to the findings of Gilovich et al. (1998), which demonstrated an illusion of transparency solely among liars,⁶ we observed the opposite, consistently finding an illusion of transparency when participants told the truth, but not when they lied. In these three studies, participants consistently overestimated the transparency of their true statements and underestimated the transparency of their lies, demonstrating that an illusion of transparency exists when individuals are telling the truth.

The absence of an illusion of transparency when lying was an unanticipated and surprising result. Based on previous research, we expected to observe an illusion of transparency when participants lied. However, individuals' predictions of the number of people who would detect their lies were at chance levels throughout these studies, but their predictions regarding the number of people who would believe their true statements were greater than chance. This was true for both their predictions of the judgments of the other players and for an imaginary audience of ten hypothetical adults. Because, the other players were only slightly better than chance at correctly determining veracity, consistent with the body of literature on deception detection (Bond & DePaulo, 2006), the overestimation of the believability of true statements yielded a clear illusion of transparency for truthful statements.

⁶ Gilovich et al. (1998) found that truth-tellers estimated that 63% of observers would say they were telling the truth, however 73% did so. However, this could have been a result of how the questions were framed as these results were obtained by reverse scoring predicted estimates of the number of observers who would think they were lying.

When lying, participants' predicted transparency did not significantly differ from their actual transparency in studies 1 and 2, and in study 3 adult participants actually had a strong "illusion of opaqueness," estimating that their lies were less detectable than they actually were by a significant margin. These findings have important implications for the criminal justice system because both an illusion of transparency when truthful and an illusion of opaqueness when deceitful may increase individuals' propensity to waive their *Miranda* rights and talk with police officers, depending on their guilt/innocence. The results of these studies indicate that truthful people believe others will see them as truthful and that liars have more confidence in their lie-telling abilities than they should, as they were identified as liars at a rate greater than their predictions.

In general, people believe it is important for others to think they are honest. We asked individuals in this series of studies two questions related to this. First, we asked participants "How important is it for you to be seen as trustworthy?" (0–3 from not important to very important). Seventy percent of participants, across three studies said it was very important to be seen as trustworthy, and an additional 27% said it was somewhat important ($M = 2.67$, $SD = 0.56$). This demonstrates that participants clearly think it is essential for others to see them as trustworthy individuals, regardless of age, gender or ethnicity. We also asked the participants in all three studies a yes-no question, "Is it important for people to think you are an honest person?" In response to this question, 94.6% of participants said, "yes." It is possible that the difference in transparency for true and false statements in this study could be a result of people seeing themselves as honest and wanting to be seen as honest by others, therefore over predicting the number of others who would see them as honest and under predicting their success as a liar. When lying is unsuccessful and detected, people can explain this failure as a positive

characteristic (I am an honest person, an inexperienced liar). People may be more likely and more willing to describe themselves as poor liars because of this relationship between honesty and poor lie-telling. Clearly, these participants think it is important to be seen as honest and may present themselves that way to others. As mentioned earlier, the differences in predictions of transparency may stem from a truth bias through which speakers expect others to accept the version of them presented to others (Goffman, 1959). Though the truth bias is often mentioned in the deception detection literature (e.g., Vrij, 2010) as a receiver bias, it may manifest itself among speakers as well. Participants may be consciously or unconsciously aware of the truth bias, expecting others to judge them as truthful more often than not, and this may be why we observed an illusion of transparency for true statements only. Predictions of truth transparency when truthful would be increased because of this bias and predictions of lie transparency when lying would be deflated by the truth bias.

In order to investigate if there was a perceiver bias, the percentage of statements that were deemed truthful or deceptive were analyzed in each of the studies. Though no perceiver bias was observed in Studies 1 and 2, there was a truth bias demonstrated in Study 3. Participant-observers were significantly more likely to judge statements as truths than as lies. This corresponds to research that has previously shown that receivers demonstrate a truth bias (e.g., Vrij, 2010). Manipulations of self-awareness, however, did not impact perceivers' judgments of veracity. We also did not find a difference in the illusion of transparency as a function of the age or grade of the participants. The rationale for the hypothesis that adolescents would feel more transparent than younger children was due to their developing self-consciousness. Research has demonstrated a link between self-consciousness and transparency (e.g., Vorauer & Ross, 1999, study 1), as well as a developmental trend in which self-

consciousness increases through childhood and adolescence (e.g., Elkind & Bowen, 1979). This developmental trend was not observed among this group of participants, offering an explanation as to why age differences in feelings of transparency were not revealed. As mentioned earlier, it is possible that having participants complete the Self-Consciousness Scale at the end of the study may have impacted participants' responses. In addition, age differences were examined using a cross-sectional design, not longitudinal, which could have impacted the self-consciousness findings. Nevertheless, unlike the results of the illusion of transparency experiment by Gilovich et al. (1998, 1c), which found a correlation between private self-consciousness and transparency, these studies found that private self-consciousness was unrelated to any of the estimates of transparency or illusion of transparency scores.

Although predictions of transparency did not differ as a function of age group, consistent with previous research (i.e., Talwar & Lee, 2002a), younger children were not as effective liars as older children, as their lies were more accurately detected. Though the child, adolescent and adult participants showed an illusion of transparency when truthful, but not when lying, there was a distinct difference. The reason that an illusion of transparency was observed when truthful but not when lying in the adult samples was that adults over predicted the believability of their truths more than the detectability of their lies. Since observers were around chance levels in detection accuracy for both truths and lies, a greater difference was seen between feelings of transparency and actual transparency in Studies 2 and 3. However in Study 1, child and adolescent participants did not show a significant difference in their feelings of transparency; the illusion was instead driven by a difference in the detectability of true and false statements by observers. Younger participants were actually more transparent when lying, minimizing the likelihood of an illusion of transparency when lying.

Besides the differences in the illusion of transparency between truthful and deceptive statements, another finding that was consistent with adult participants was an interaction between how the prediction question was framed and the veracity of the statement. When participants told the truth and were queried with the truth frame, their estimations of the number of observers who would deem them as truthful was highest. This finding may explain why Gilovich et al. (1998) found an illusion of transparency solely among liars. In the series of studies by Gilovich et al. participants only estimated the detectability of their lies, which may have inflated predictions as a function of the salience of the frame. In our previous study (Mandelbaum et al., 2014), we asked participants to estimate believability and the results showed an illusion of transparency only among truth-tellers. However, it is unclear if framing had an effect in that study because it was not a manipulated variable, and framing did not interact with veracity among the child and adolescent participants in study 1.

Though the two framing conditions were fundamentally the same, the way the question was presented clearly impacted the predictions made by participants. Similar to the research cited earlier (Levin, 1987; McNeil et al., 1982; Duchon et al., 1989), when the prediction question was framed in a positive way (truths believed), participants responded with higher rates of positive responses. However, when participants were presented with the lie frame, there were no differences between their predictions of lies detected or truths believed. This finding has implications for future research on deception detection. Researchers investigating deception detection should be mindful regarding how questions are presented to participants. Questions asking people to identify a liar or a truth-teller should pose the questions both ways in order to avoid the framing effect observed in these studies.

The observed framing effect can also have real-world impact, such as in the criminal justice system. For example, jurors' judgments of the credibility of a witness may be artificially inflated or deflated depending on how the questions are framed. Asking jurors if they think a witness is being deceptive may result in different decisions than if the same jurors are asked if they believe the witness. The criminal justice implication most relevant to this line of research is that the way suspects are questioned may interact with their feelings of transparency and their willingness to waive their *Miranda* rights and speak with police officers. Innocent suspects waive their rights because they think their truths will be believed (Kassin, 2005). Though individuals know their internal states are not public knowledge, the strong subjective experience may cloud estimations of how obvious their veracity is to others, and how questions are asked may increase or decrease their feelings of transparency.

Another element that may have impacted differences in predictions of the truth and lie determinations of others relates to the psychology of forecasting. Research has shown that individuals are more likely to predict positive future life events than negative (Dunning, 2005). Research on the psychology of forecasting shows that people tend to overestimate their own skills, the accuracy of their opinions, and their future prospects for success. This self-assessment bias may have led individuals to predict that their truths would be believed at a high rate and also led to overestimations of their success as a liar, if they believed that successful deception was positive event.

It was predicted that mock video recording some of the statements made by participants would increase their situational public self-awareness for those statements and lead to increased feelings of transparency. However, this hypothesis was only supported in Study 1 with our child and adolescent participants. Among the adult participants in Study 2, mock video recording led

to a decrease in their illusion of transparency scores. A possible explanation of this unanticipated inconsistency is that in Studies 1 and 2, the camera manipulation involved turning the camera on and off when called for, but the camera was still present and may have increased public self-awareness simply by being in the room, with the possibility of being videotaped on the horizon. The anticipation of being videotaped may have increased self-awareness. Also, the determination of which statements would be videotaped was done by a random draw. After a statement was recorded, a carryover effect may have impacted subsequent levels of self-awareness. We attempted to correct this limitation in Study 3, however no significant impact of video recording was found in Study 3 either.

Another factor that may have impacted the self-awareness manipulation was that there was an audience of other players, and research has shown that audience presence can increase feelings of self-consciousness and/or self-awareness (Hass, 1984). Finally, it is possible that the adult participants were not convinced that the camera was actually recording their statements, though the child participants, who have little or no experience participating in research, did believe the camera was recording them. Though it may have been a result of a hindsight bias, during the debriefing when participants were told that nothing was actually recorded, a few participants expressed that they thought or suspected that to be the case. In future studies, participants in the video conditions will actually be recorded.

These experiments also attempted to explore individual differences in the illusion of transparency as a function of dispositional self-consciousness because previous research has found interplay between transparency and both public self-consciousness (Vorauer and Ross, 1999) and private self-consciousness (Gilovich et al., 1998, Study 1c). It was expected that a relationship between private self-consciousness and feelings of transparency would be observed,

as demonstrated in Study 1c by Gilovich et al. (1998), in which participants with a greater focus on their internal states predicted more transparency when lying; however, no such relationship was revealed. Private self-consciousness was unrelated to predictions of transparency and the illusion of transparency throughout the three experiments. The relationship between public self-consciousness and transparency is less clear. In Study 1, children and adolescents higher in public self-consciousness predicted more transparency when truthful; however, this relationship was not observed consistently in the experiments that followed. As mentioned earlier, public self-consciousness peaks and then declines during adolescent development (e.g., Elkind & Bowen, 1979), possibly explaining why a relationship was observed in Study 1, but not among the adult samples in Studies 2 and 3. Clearly, additional research is needed to draw any firm conclusions regarding the relationship between self-consciousness and the illusion of transparency when lying and telling the truth.

Additionally, research has shown that social anxiety can impact transparency (Savitsky & Gilovich, 2003). The social anxiety subscale was found to correlate with the illusion of transparency in Study 3, whereby participants with higher social anxiety experienced a greater degree of the illusion of transparency when lying, but a lesser degree when telling the truth. This is likely related to their lie-telling ability. Consistent throughout, participants who described themselves as good liars had lower levels of social anxiety than self-reported bad liars. Participants also had some awareness of their effectiveness as a liar. In studies 1 and 2, the lies told by good liars were less detectable than those told by bad liars, and this could be a result of a difference in nonverbal behaviors between bad (socially anxious) and good (less socially anxious) liars.

The illusion of transparency should be tested further with participants who claim to be good liars. Is it possible that these “expert” liars have an illusion of opaqueness? As part of these studies, participants were asked if they were good liars and the differences between self-reported good and bad liars were explored. Across all three studies, self-reported good liars had lower scores on the Social Anxiety subscale of the Self-Consciousness Scale. Individuals who are more socially anxious appear to have less confidence in their lie-telling ability and for good reason—the lies of bad liars were more detectable than those of good liars. It is possible that individuals who have greater levels of social anxiety exhibit more of the non-diagnostic cues often associated with deceit, such as gaze aversion and signs of nervousness (Vrij, 2010). Indeed, Vrij and Winkel (1992b) investigated the relationship between social anxiety and lying and found that individuals who were more socially anxious were less likely to persist in their denials of a wrongdoing (54%) than non-anxious participants (81%). Though nonverbal behaviors were not assessed as part of these experiments, an implication may be that interrogations are even more dangerous for innocent individuals with a greater degree of social anxiety, as they may be more likely to be misidentified as lying due to their nonverbal behaviors. Throughout these studies, participants with more social anxiety reported being less effective liars than participants with lower levels of reported social anxiety. It is possible that this difference stems from previous experience as an effective or ineffective liar. Our results show that the self-reported good liars felt less transparent than self-reported bad liars. Therefore, participants with lower social anxiety scores may be more willing to waive their *Miranda* rights because they believe they will be able to lie effectively. Future research will examine the nonverbal behaviors associated with lying and truth-telling in this paradigm. It is possible that this relationship stems from a fear of being detected among the socially anxious participants.

Though clear and consistent relationships between the subscales of the Self-Consciousness Scale and the illusion of transparency were not found among these experiments, future research should continue to explore this relationship. Since research demonstrates there to be a spike in self-consciousness during adolescence, it may be an additional factor that makes youthful suspects more vulnerable, warranting additional exploration. For instance, the presence of peers might be more influential for an adolescent in a legal context, given their heightened self-consciousness and concern with peer relationships, which could impact their decision-making (Rankin et al., 2004). Perhaps innocent suspects who do not waive their *Miranda* rights have lower levels of self-consciousness than those who waive their rights. Thus, the relationship between self-consciousness and *Miranda* waivers and self-consciousness and false confessions are additional areas for future study.

This research also allowed for a test of deception detection accuracy among peers (child, adolescent, and adult), using natural, real-life (not videotaped), unrehearsed, uncoached, truthful and deceptive statements, which adds to the limited research on deception among children and adolescents. In this series of experiments, all statements made were based on real-life experiences. Studies investigating deception and deception detection regularly rely on instructed lies which often employ contrived scenarios in which participants are instructed to act “as if” they were lying (e.g., DePaulo, 1994) and may not accurately represent the phenomenology of real lies. Additionally, research investigating deception detection among children often employs coached lies, in which child participants are asked to lie for the benefit of another, often a stranger (e.g., Vrij, Akehurst, Soukara, & Bull, 2004). Once again, these types of lies may not accurately capture the intricacies of real-life lies.

Research has also shown that the characteristics of the judge and the target impact detection accuracy (Porter, Campbell, Stapleton, & Birt, 2002). However, the design of these studies controls for this issue by manipulating veracity within participants, thus the characteristics of the targets are the same for true and false statements. It was observed that truth/deception detection accuracy was approximately 56% across three studies and over a thousand statements, which is consistent with the body of literature on deception detection accuracy. However, throughout this series of studies, accuracy rates were almost identical for truths (56.1%) and lies (55.9%), which is somewhat contrary to the findings from Bond and DePaulo's (2006) meta-analysis which reported that adults were more accurate at detecting truths (61%) than lies (47%).

The results from these studies have important implications for the legal system, as well as everyday interactions. Research has demonstrated that juveniles differ from adults in many ways, making them more vulnerable during an interrogation. The illusion of transparency may be an additional risk factor. Since children and adolescents did exhibit an illusion of transparency when truthful, policies regarding the interviewing of children may need to be adjusted, especially considering that video recording increased this illusion among our child and adolescent participants.

There are also other forensic implications of this series of studies related to differences in the phenomenology of innocence and guilt. It has been discussed that the innocent are more likely than the guilty to waive their *Miranda* rights and speak with investigators (Kassin & Norwick, 2004), likely due to an illusion of transparency when truthful. However this is just the beginning of a series of events during which the phenomenology of innocence can ultimately result in a false confession. Innocent suspects may believe that their innocence will protect them

from experiencing negative outcomes. Bolstered by a psychological state referred to as the phenomenology of innocence (Kassin, 2005), innocent suspects experience less stress when first accused of a crime and during the interrogation that follows, than guilty suspects (Guyll et al., 2013). Guyll et al. (2013) found that, in comparison to their guilty counterparts, innocent participants perceived themselves to be less endangered by an accusation and more able to manage the situation successfully. The state of being actually innocent (or truthful) produced an immediate and fundamental difference in suspects that could lead to poor choices and increase their risk of self-incrimination. This study also reported that though innocent suspects initially experienced less stress, once an interrogation began, the pressure of resisting during an interrogation may activate a stress-related physiological mechanism heightening fatigue and despair, eroding will-power, and contributing to false confessions (Guyll et al., 2013).

The poor choices an innocent suspect may make in such a state include waiving their rights to an attorney or to a lineup, and their reactions to false evidence and ‘bluffs’ (Perillo & Kassin, 2011). The bluff is a ploy used by interrogators in which they pretend to have evidence without asserting that it implicates the suspect (e.g., stating that witnesses will be interviewed or DNA evidence was found at the scene). The idea behind the bluff is that guilty suspects would feel threatened by the evidence but innocent suspects would not. Though, intuitively, this makes sense, innocent suspects may be more likely to falsely confess due to a misplaced confidence that their admission will be disproved by the evidence.

The illusion of transparency can also potentially impact plea bargaining decisions. Bordens (1984) investigated plea decisions, using a design in which several variables were manipulated: the sentence if the plea was accepted or rejected, the advice of a defense attorney regarding the likelihood of conviction, and subject’s guilt or innocence). Participants estimated

the likelihood of a conviction and if they would accept the plea. Guilt or innocence has a strong effect on plea decision (80% of guilty and 20% of innocent suspects accepted the plea). Gregory, Mowen, and Linder (1978) also found that guilty suspects were more likely to accept a plea than innocent suspects. Only eighteen percent of the innocent suspects were willing to agree to a plea bargain, compared to 83% of the guilty suspects. Though the illusion of transparency was not mentioned in these studies, this phenomenon could play a significant role. Innocent suspects were less willing to accept a plea and go to trial because they likely felt as though their innocence would be apparent. On the other side, guilty suspects may be more willing to accept a plea because they also believe their guilty internal state would be accurately assessed down the line.

Another implication that may stem from this research relates to a policy that has been strongly supported by experts in interrogation—the video recording of police interviews and interrogations. A recent American Psychology-Law Society White Paper (Kassin et al., 2010) fervently recommended the mandatory recording of interrogations. Though video recording has substantial benefits, such as deterring police from engaging in controversial tactics during an interrogation and allowing judges and jurors to view entire interrogations, there may be some downsides along with the virtues of video-taping interrogations. Kassin, Kukucka, Lawson, and DeCarlo (2013) recently investigated if police officers act differently when they know they are being recorded during an interrogation. The results indicated that, indeed police officers do alter their behaviors and tactics somewhat when informed that they will be recorded, yet we do not know to what degree suspects' behaviors may be affected by the known presence of a video camera. The results of these studies indicate that video recording can impact feelings of transparency, especially among our child and adolescent samples. If the presence of a camera

increases situational public self-awareness, and this, in turn, increases the prevalence of the illusion of transparency, we may see even more innocent suspects and fewer guilty suspects waiving their *Miranda* protections when they know they are being recorded.

Limitations and Future Directions

The size of the child and adolescent samples was a clear limitation to Study 1. Though an illusion of transparency was observed for true statements, and situational self-awareness impacted transparency predictions, with a larger sample, some of the results that were found to be marginally significant may have reached significance. An additional limitation to Study 1 was that each age group was sampled from a different school or program in a different neighborhood; therefore, other demographic differences may have impacted the results. However, through the series of experiments, no significant differences were found on any of the dependent variables as a function of demographic information (ethnicity or gender).

Though the age of the participant was not a significant factor in these studies, differences between children, adolescents and adults were observed and research on the development of lying and the illusion of transparency should continue because differences were observed in the detectability of children's lies, as well as the impact of situational public self-awareness. The numbers of adolescent false confessions are staggering. It is important for applied research to investigate the psychological theories that underlie behavior, especially behavior on which one's freedom could depend. The illusion of transparency is one such factor. It is an important element during police interrogations that could be the difference between freedom and prison. In the absence of this illusion when truthful, fewer innocent suspects would submit themselves for interviews/interrogations.

An important limitation to this series of studies is that they lack the ecological validity to make conclusions about what would occur in a forensic setting. For example, the results might have looked completely different if we had used a more forensically relevant receiver sample (e.g., police officers). The lies told were also not forensically relevant (e.g., high stakes lies about transgressions), nor was the setting (e.g., one-on-one interview-style interactions). Each of these factors may impact feelings of transparency and the illusion of transparency.

Had the receivers been police officers, it is possible that participants would have felt more transparent because they believe that police officers are better at detecting deception than were their fellow participants. In Study 1, no differences were found between participants' predictions of transparency as a function of who would be making the veracity decision. However, these results were likely limited by the hypothetical nature of the adult evaluators. The "hypothetical adult" probably did not capture the degree of transparency that kids would more likely have felt before parents, police, judges, and others who know them well, are authority figures, or are considered experts in lie detection.

Lies about transgressions may have also made participants feel more transparent. Crimes may produce evidence that could be corroborated (e.g., witnesses, fingerprints). None of the lies told as part of this series of studies could be proven or disproven by the observers, possibly reducing feelings of transparency. Additionally, lies about transgressions may be more emotional than those used in the current study and research on the illusion of transparency posit that emotional leakage causes feelings of transparency among lie-tellers (e.g., Gilovich et al., 1998). Finally, police interviews are conducted in one-on-one settings instead of in front of an audience of other players. Research has found that the presence of an audience can increase feelings of self-consciousness and/or self-awareness (Hass, 1984). Now that we know that there can be an

illusion of transparency experienced when telling the truth, future research should continue using more forensically relevant manipulations.

Another possible limitation may be that child and adolescent participants were judging their peers and classmates. Research has also demonstrated an own-age bias when detecting deception (Slesslor, Philips, Ruffman, Bailey, & Inch, 2014). Participants were more likely to trust deceptive speakers of their own age relative to other speakers. In this series of studies, participants were judging the veracity of others of the same age groups and thus may have been susceptible to this bias. For example, among the elementary school participants, lies were detected at a high rate, but this rate may have been even higher if statements were assessed by older participants. This bias may also explain the low rate, 42.5%, at which middle school participants accurately detected the lies told by their peers.

Use of the *Life Event Inventory* was another limitation to this series of studies. Asking subjects if an event happened to them in the past is not the same as asking whether they can recall the exact details of the event. It is possible that statements made, though presumed to be generally true, were not well remembered and could lie somewhere between a truth and a lie, thus clouding the veracity manipulation and impacting feelings of transparency. Though the majority of participants across all three studies told two truths and two lies, an unforeseen limitation of the study was the amount of life events presented to the participants on the LEI. Some participants reported experiencing all or almost all of the life events (limiting the number of lies they could tell) or none or almost none of the life events (limiting the number of truths they could tell). In future studies, more life events will be added to increase chances of having all participants tell two truths and two lies. Relatedly, the statements made by participants were all relatively short, often consisting of just a few sentences. It is possible that lengthier responses

would make people feel more transparent. As people talk more, and begin to over-talk, they may feel as though they are giving away more of their internal state. Varying the length of responses should be examined in a future study.

In order to help individuals avoid the problems associated with an illusion of transparency, people must be made aware of the phenomenon. Previous research on the illusion of transparency and speech anxiety has shown that when informed about the illusion, speakers rated themselves more positively and expected observers to rate them as more relaxed than others who were not informed about the illusion of transparency. However, even more importantly, the informed speakers were rated as more composed and their speeches were rated more positively by observers. However, these benefits were not the same for participants who were simply told not to worry about the impressions of others (Savitsky & Gilovich, 2003). As the authors put it, “Knowing about the illusion of transparency, in other words, allows speakers to be better speakers” (Savitsky & Gilovich, 2003, p. 623). It is possible that knowing about the illusion of transparency in a truth/deception detection context could reduce individuals’ over-predictions of their own transparency when truthful. It is possible that this phenomenon is so prevalent that it should be part of the *Miranda* warning itself, which will be a future study in which we replicate the majority of the procedures but include a “warning” condition. One could imagine that telling innocent suspects that people have a tendency to think that their veracity is more apparent to others than it actually is, and that observers are not as skilled at detecting veracity as we expect, would reduce the number of innocent people waiving their right to silence.

Future studies should also evaluate the relationship between self-monitoring and the illusion of transparency in a truth/deception detection context. A previous related study (Hu & Yang, 2009) investigated self-monitoring and the illusion of transparency by replicating the

“distasteful drink” study from Gilovich et al. (1998) and found that low self-monitors showed a greater level of the illusion of transparency than high self-monitors. One explanation for this result was that high self-monitors engaged in self-presentation techniques. This idea should be replicated in the truth/lie-telling paradigm because self-monitoring may be an individual difference factor that impacts various manifestations of the illusion of transparency. Research on self-monitoring has also demonstrated that high and low self-monitors are differently impacted by self-awareness manipulations. Webb, Marsh, Schneiderman, and Davis (1989) found that high self-monitors showed a greater responsiveness to manipulations of public self-awareness and low self-monitors showed a greater responsiveness to manipulations of private self-awareness.

Additional future investigations and implications of the illusion of transparency exist across forensic contexts; it could be applied to witnesses during testimony, suspects making plea-bargaining decisions, jurors during voir dire, and even clinical settings—any arena where it is essential to determine veracity. Future research should examine other factors that could potentially impact feelings of transparency, such as race. The illusion of transparency may be influenced by the race congruence or incongruence of the suspect–interrogator combination. Research by Vorauer (2005) demonstrated that intergroup interactions may yield greater estimates of transparency than intragroup interactions. In this study, White Canadian participants perceived their interest in becoming friends with a First Nations partner to be more transparent than a White Canadian partner. An explanation of this difference in transparency may be that the novelty of interacting with an out-group member may prompt heightened self-awareness, thereby enhancing feelings of transparency. Also, the research has led to the question of whether the illusion of transparency is a self-illusion or a theory about people in general. A future study

should investigate what would have happened if the participants answered on behalf of a peer instead of themselves.

Finally, future studies should also include a continuous scale (in addition to a dichotomous decision) for truth and deception judgments by observers because previous research has found that by using a scale of doubt, participants were better able to distinguish lies from true statements (though still with some degree of error) (e.g., Rai, Mitchell, & Faelling, 2012).

Conclusion

In summary, the current experiments have established that an illusion of transparency exists among truth-tellers when they are asked to predict the likelihood that others would be able to correctly determine if they were truthful. However, the illusion of transparency was not observed for deceptive statements. Additionally, this paradigm demonstrated that the way the prediction question is framed can strongly impact the estimates participants make of their own transparency. Demonstrating that an illusion of transparency exists among truth-tellers lends empirical support for the reported differences in *Miranda* waivers between innocent and guilty suspects. Though future research is needed to ascertain a direct link between the illusion of transparency and *Miranda* waivers, this research provides empirical support that truthful individuals expect their truths to be believed at rates greater than they are actually believed and may waive their right to silence because of this belief. This series of studies also demonstrated that truth/deception detectors perform at slightly greater than chance rates. Developmental differences in self-consciousness were not observed and may explain why neither feelings of transparency nor the illusion of transparency were impacted by the grade level of child and adolescent participants. The impact of situational manipulations of self-awareness on feelings of transparency and the illusion of transparency were inconsistent and require additional study,

however, children and adolescents reported greater feelings of transparency when they believed they were being video recorded. Once the developmental trajectory of the illusion of transparency and its implications for behavior in forensic settings are better understood, then there is a greater likelihood that interventions can reverse the alarming rates of adolescent false confessions and return justice to the juvenile justice system.

APPENDIX A – Life Event Inventory (Version 1)

Please respond yes (Y) or no (N) for each of the following. Please do not discuss your answers with the other participants

1. Do you remember an occasion when you rode your bike, fell over and hurt yourself? _____
2. Do you remember an occasion when you were bitten by a dog? _____
3. Do you remember an occasion when you were scratched by a cat? _____
4. Do you remember an occasion when you were stung by a bee? _____
5. Do you remember an occasion when you lost money? _____
6. Do you remember an occasion when you received a shot at the doctor? _____
7. Do you remember an occasion when you burnt yourself on the stove? _____
8. Do you remember an occasion when you sprained your ankle? _____
9. Do you remember an occasion when you tasted something gross? _____

APPENDIX C – Speaker Sheet – Truth Frame Version

1. Circle which topic was first:

Bike Bee Money
Dog Doctor Ankle
Cat Stove Something Gross

Mark whether you were recorded or not : Yes No

Mark whether you told a truth or a lie: Truth Lie

How many other players will believe you are telling the truth?

Pretend that 10 other adults were here watching you tell the truth or a lie. Guess how many of *them* would believe you are telling the truth (0 – 10).

2. Circle which topic was second:

Bike Bee Money
Dog Doctor Ankle
Cat Stove Something Gross

Mark whether you were recorded or not : Yes No

Mark whether you told a truth or a lie: Truth Lie

How many other players will believe you are telling the truth?

Pretend that 10 other adults were here watching you tell the truth or a lie. Guess how many of *them* would believe you are telling the truth (0 – 10).

3. Circle which topic was **third**:

Bike	Bee	Money
Dog	Doctor	Ankle
Cat	Stove	Something Gross

Mark whether you were recorded or not : Yes No

Mark whether you told a truth or a lie: Truth Lie

How many other players will believe you are telling the truth?

Pretend that 10 other adults were here watching you tell the truth or a lie. Guess how many of *them* would believe you are telling the truth (0 – 10).

4. Circle which topic was **fourth**:

Bike	Bee	Money
Dog	Doctor	Ankle
Cat	Stove	Something Gross

Mark whether you were recorded or not : Yes No

Mark whether you told a truth or a lie: Truth Lie

How many other players will believe you are telling the truth?

Pretend that 10 other adults were here watching you tell the truth or a lie. Guess how many of *them* would believe you are telling the truth (0 – 10).

APPENDIX D – Speaker Sheet – Lie Frame Version

1. Circle which topic was first:

Bike Bee Money
Dog Doctor Ankle
Cat Stove Something Gross

Mark whether you were recorded or not : Yes No

Mark whether you told a truth or a lie: Truth Lie

How many other players will think you are lying?

Pretend that 10 other adults were here watching you tell the truth or a lie. Guess how many of *them* would think you are lying (0 – 10).

2. Circle which topic was second:

Bike Bee Money
Dog Doctor Ankle
Cat Stove Something Gross

Mark whether you were recorded or not : Yes No

Mark whether you told a truth or a lie: Truth Lie

How many other players will think you are lying?

Pretend that 10 other adults were here watching you tell the truth or a lie. Guess how many of *them* would think you are lying (0 – 10).

3. Circle which topic was **third**:

Bike	Bee	Money
Dog	Doctor	Ankle
Cat	Stove	Something Gross

Mark whether you were recorded or not :

Yes No

Mark whether you told a truth or a lie:

Truth Lie

How many other players will think you are lying?

Pretend that 10 other adults were here watching you tell the truth or a lie. Guess how many of *them* would think you are lying (0 – 10).

4. Circle which topic was **fourth**:

Bike	Bee	Money
Dog	Doctor	Ankle
Cat	Stove	Something Gross

Mark whether you were recorded or not :

Yes No

Mark whether you told a truth or a lie:

Truth Lie

How many other players will think you are lying?

Pretend that 10 other adults were here watching you tell the truth or a lie. Guess how many of *them* would think you are lying (0 – 10).

APPENDIX E – SCSR

Please answer the following questions about yourself. For each of the statements below, tell us how much each statement describes you by writing a number in the space provided, using the following scale:

3 = a lot like me

2 = somewhat like me

1 = a little like me

0 = not like me at all

There are no right or wrong answers. Please be as honest as you can and try not to let your responses to one question influence your responses to other questions.

1. I am always trying to figure myself out _____
2. I am concerned about my style of doing things _____
3. It takes me time to get over my shyness in new situations _____
4. I think about myself a lot _____
5. I care a lot about how I present myself to others _____
6. I often daydream about myself _____
7. It is hard for me to work when someone is watching me _____
8. I never think really hard about myself _____
9. I get embarrassed very easily _____
10. I am very aware about the way I look _____
11. It is easy for me to talk to strangers _____
12. I usually pay attention to how I feel inside _____
13. I usually worry about making a good impression _____
14. I am constantly thinking about why I do things _____
15. I feel nervous when I talk in front of a group _____
16. Before I leave my house, I check how I look _____
17. Sometimes I think about the person that I am _____
18. I am concerned about what other people think of me _____
19. I am quick to notice changes in my mood _____
20. I am usually aware of my appearance _____
21. I know the way my mind works when I figure out a problem _____
22. Large groups make me nervous _____

APPENDIX F – Demographics Questionnaire

1. Are you a good liar? (yes/no) _____

2. Why? (What makes you a good or bad liar?)

3. How important is it to you to be seen as truthful? (Please circle your response)

Not important A little important Somewhat important Very important

4. Is it important for people to think you are an honest person? (yes/no) _____

5. Why?

6. How old are you? _____

7. How would you describe your background? (Please circle all that apply).

- African American/Black
- American Indian/Alaskan Native
- Asian/Pacific Islander
- Caucasian/White (non-Hispanic)
- Hispanic (Latino/Latina)
- Mixed, please specify: _____
- Other, please specify: _____

8. What is your gender? Male Female

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