

**LANGUAGE OF LOW-STAKES AND HIGH-STAKES DECEPTION:
DIFFERENCES WITHIN INDIVIDUALS**

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Abstract

Every person tells lies and does so in a variety of contexts. Further, there are groups of individuals who are more inclined to deceive and manipulate others, such as the Dark Triad collection of personalities (psychopathy, Machiavellianism, narcissism). Deception is often categorized into low-stakes and high-stakes deception. Low-stakes deception typically has no or minimal consequences for the deceiver. In contrast, high-stakes deception involves serious consequences for the deceiver, such as becoming incarcerated if caught lying about committing murder. Despite the abundance of research conducted on the cues indicative of low- and high-stakes deception, little is known about how individuals deceive in different lying scenarios. This thesis examined the verbal cues of deception in individuals within *both* low- and high-stakes settings. The purpose of the current thesis was threefold. First, the study sought to examine whether verbal cues of deception were apparent in comparison to honest speech and whether the linguistic cues in low-stakes lies were more pronounced in high-stakes lies. Secondly, the present study investigated whether Dark Triad individuals felt less negative emotion across the two lying scenarios in comparison to those without dark personalities. Finally, the study sought to see if Dark Triad individuals were more successful at deception in comparison to their counterparts. For the first research question, results revealed that word count, emotional tone, and the usage of personal pronouns showed variability across low- and high-stakes scenarios. Specifically, word count was found to be higher in low-stakes truths in comparison to low-stakes lies, but the reverse was found for high-stakes sessions. Additionally, more emotional tone and personal pronouns were found in low-stakes lies than in high-stakes lies. In regards to the second research question, results showed that dark personalities (known to have low empathy for others and callousness) did not experience a different pattern of emotions across low- and high-stakes

settings in comparison to their counterparts. Finally, the present study demonstrated that Dark Triad individuals were no better at deception than those who scored lower on these traits. The implications of these findings and future directions for research are discussed.

Preface

Ethics approval for this research was granted by the University of British Columbia's Behavioural Research Ethics Board on October 16th, 2015. The ethics approval certificate number for the current study is H15-02213. To date, the research included in this thesis has not been published.

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Dedication

To my future self.

“Certainly, if we had surer ways to identify truth, deceit might be less prevalent”

— Bailey, 1991, p. xxi

Chapter 1: Introduction

1.1 Deception

What constitutes a lie? The traditional definition among philosophers is that you lie if you say something you believe to be false with the intent to deceive (Augustine, 1952). In contrast, false statements communicated by people who are genuinely mistaken or are unaware are not considered lies (DePaulo et al., 2003). Deception may take many forms, including outright lies (falsification), using evasive or ambiguous language (equivocation), withholding (or omitting) important information, exaggerating the truth, or using understatements (Buller, Burgoon, White, & Ebesu, 1994; Masip, Garrido, & Herrero, 2004). Lying is a concept that is studied among many disciplines and also crosses cultural and historical boundaries (DePaulo, Kashy, Wyer, & Epstein, 1996). Perspectives on lying are just as diverse. Deception has been described in negative ways, such as a force that threatens the morale of societies (Bok, 1978) or a predictor of ominous life outcomes (Stouthamer-Loeber, 1986). Conversely, it has also been conceptualized in more positive ways, such as a higher-level social skill (DePaulo & Jordan, 1982; Nyberg, 1993) and an important developmental milestone (deVilliers & deVilliers, 1978). Deception traces back to early human evolutionary history (e.g., Livingstone Smith, 2004) and has long been documented as prevalent, even in the animal kingdom (Altschuler, 1925). Although there are many different types of lies used, deception is often separated into two categories: low-stakes deception and high-stakes deception.

1.1.1 Low-Stakes Deception

In low-stakes lies, the person has nothing truly substantial to lose or gain from the statement. Such low-stakes lies are commonplace; research has found that people lie about twice a day on average (DePaulo et al., 1996). Lies also occur in a variety of communication mediums and have been found in 14% of emails, 37% of telephone calls, and 27% of face-to-face interactions (Hancock, 2007). In everyday life, people most frequently lie about their feelings, preferences, and their attitudes and opinions; some purposes these lies could serve are to make one appear more sophisticated, protect oneself from disapproval, and from hurting other people's feelings (DePaulo et al., 2003). Most of these lies are never caught, and would typically have minimal consequences for the person if they were.

1.1.2 High-Stakes Deception

When the stakes are raised, a greater cognitive load and more emotional arousal are typically felt in comparison to low-stakes scenarios (Caso, Gnisci, Vrij, & Mann, 2005). In high-stakes lies, deceivers often need to devote a large amount of effort to keep the details of their lies consistent, attempt to control one's behaviour in order to produce a convincing lie, and appear credible to another person who is likely skeptical (Porter & ten Brinke, 2010). Often, high-stakes lies are also associated with an array of powerful emotions (e.g., fear, remorse, anger, excitement) that the deceiver must suppress and/or convincingly simulate (ten Brinke & Porter, 2012). Similar to some of the reasons for engaging in low-stake lies, Walczyk, Harris, Duck, and Mulay (2014) posited that common motives for high-stakes deception are: 1) for instrumental reasons (such as obtaining rewards, power, social position, or other advantages by exploiting others); 2) to avoid punishment; 3) to protect oneself (from confrontation or embarrassment); 4) for self-presentation reasons (to save face or create false impressions about the liars' identity); 5) to protect or help

others; 6) out of a feelings of entitlement (such that they feel justified in hiding a truth they feel is unfairly disapproved); 7) to hurt others (out of anger or vengeance), and 8) to control interpersonal relationships. Therefore, although low- and high-stakes lies have some overlap in terms of motive, the two categories more often represent very different deceptive goals and contexts, as well as effects on the liar. One way this might be representative in the deceiver's behaviour is in the language employed when engaging in low- and high-stakes lies.

1.2 Verbal Cues to Deception

Extensive research has been conducted to identify the cues that are associated with deception. The four major types of cues that have been found to be useful in studying deception are non-verbal information (which is further broken down into facial expressions and body language) and verbal information (which is further broken down into paraverbal characteristics such as tone, pitch, and voice and linguistic content). Arguably, successful deception heavily relies on the ability to conceal a lie with well-chosen words (Duran, Hall, Mccarthy, & Mcnamara, 2010). Language is the most direct form of communication that enables humans to express their internal thoughts and feelings in a way that others could understand. People can explicitly provide explanations about opinions or their emotions by using words that reflect their current state, such as "I am angry" (Pennebaker & Graybeal, 2001). Other times the words people choose to use may offer subtle clues to their personality traits (e.g., Oberlander & Gill, 2006). Lately, analyzing language has become a means to study characteristics of groups (e.g., categorizing personality types using language) and specific behaviours (e.g., deception).

Language use has been examined in a number of forensic groups including offenders and psychopaths. For example, the speech of a convicted murderer, in the context of a police

interrogation, contained more pauses and disfluencies, such as “umm” and “hmm” while he was being deceptive in comparison to when he was being honest (Vrij & Mann, 2001). Pauses and disfluencies were also found in the speech of a group of people who attempted to feign feelings of remorse (ten Brinke, McDonald, Porter, & O’Connor, 2012). The language of psychopathic individuals has also been investigated. Hancock, Woodworth, and Porter (2013) analyzed and compared the language of psychopathic and non-psychopathic offenders convicted of homicide. The researchers found that psychopathic offenders displayed an increased use of the past tense, suggesting that psychopaths were more emotionally distant from their crime than non-psychopaths. Additionally, psychopaths have been found to use significantly more personal pronouns in their speech, highlighting their grandiose nature which is typically observed in this personality disorder (Le, Woodworth, Gillman, Hutton, & Hare, 2015).

More recently, sophisticated automated linguistic software has been used to identify the language associated with deceptive behaviour. In computer-mediated communication for example, verbal characteristics such as a low word count, the use of first-person pronouns, and the use of terms describing senses, have been found to indicate deception (Hancock, Curry, Goorha, & Woodworth, 2008). Because of the amount of cognitive effort necessary to engage in deception (ten Brinke & Porter, 2012), people may have difficulty monitoring their language use. As a result, content of speech may provide cues that lead to better detection.

To date, most deception research has focused on low-stake lies (Porter & ten Brinke, 2010). In comparison to truths, low-stake lies have been found to have various linguistic characteristics. Some studies have found that liars elaborate more in their lies resulting in a higher word count (Van Swol & Braun, 2014; Zhou, Burgoon, Zhang, & Nunamaker, 2004), which has been suggested to be a means of creating a more believable reality. Additionally, low-

stakes lies have been found to have fewer first person pronouns (such as “I” or “me”), which have been suggested to allow the speaker to dissociate from the lie (DePaulo et al., 2003; Hancock et al., 2008; Newman, Pennebaker, Berry, & Richards, 2003). A higher frequency of negative emotion words (such as “hate”, “anger”) have also been found in low-stakes deceptive discourse and could be indicative of the tension and guilt the speaker may be experiencing for being dishonest (Buller, Burgoon, Buslig, & Roiger, 1996; DePaulo et al., 2003; Vrij, 2000; Zhou et al., 2004). The above findings suggest that low-stake lies may have unique linguistic patterns in comparison to honest speech.

In contrast to the number of studies investigating low-stakes lies, only a handful of studies have examined the language used in real world high-stakes deception (ten Brinke & Porter, 2012; McQuaid, Woodworth, Hutton, Porter, & ten Brinke, 2015; Whelan, Wagstaff, & Wheatcroft, 2015). In studies investigating samples of pleaders (those who were pleading the safe return of a missing relative after being involved with their disappearance), researchers examined the language characteristics between truthful and deceptive pleaders. Inconsistent with low-stakes deception findings, the pleader studies found that the percentage of first person pronouns (McQuaid et al., 2015; ten Brinke & Porter, 2012) and positive and negative emotional words (ten Brinke & Porter, 2012) did not differ between liars and truth-tellers. Across other high-stakes situations, such as statements of criminal suspects or homicide emergency calls, the research suggests that high-stakes liars are more likely to repeat words, phrases, or details (Davis, Markus, Walters, Vorus, & Connors, 2005; Harpster, Adams, & Jarvis, 2009). Despite some studies finding the use of more word and phrase repetitions in deceptive speech (Davis et al., 2005; Harpster et al., 2009), a study with pleaders found that the overall word count for lies still remained lower than that observed in truths (ten Brinke & Porter, 2012). Two potential

reasons for this decreased word count is that the deceiver was impaired by the increased cognitive load, or they may have adopted a strategy of speaking less as a means to avoid inconsistencies in the future (Vrij et al., 2008). The above-mentioned research has studied high-stakes deception in very specific contexts, so it is unclear how generalizable the linguistic characteristics are to other high-stakes lying scenarios.

1.3. Deception Detection

It has been observed, "... that individuals are at best inaccurate at deception detection" (Hubbell, Mitchell, & Gee, 2001, p. 115). In the early years, Kraut (1980) found that the mean accuracy rate for detecting deception was 57% across 10 studies. Similarly, Vrij (2000) found a 56.6% accuracy rate when he analyzed 39 studies published after 1980. More recently, Bond & DePaulo (2006) did a meta-analysis that included 206 studies, and discovered that the deception detection accuracy was 54% on average, correctly classifying 47% of lies and 61% of truths. Overall, the above-mentioned studies suggest individuals detect lies at chance level. However, Whelan and colleagues (2015) proposed that detection rates may be different for real-life high-stakes deception scenarios because the majority of studies in prior meta-analyses (e.g., Bond & DePaulo, 2006) focused primarily on low-stakes lies. The accuracy rate of police officers were compared to non-police observers after watching videos of people telling truths or lies in an extremely high-stakes situation, such as watching videos of individuals making public appeals for help with missing or murdered relatives. Police officers and non-police participants correctly identified deceptive statements 72% and 68% of the time, respectively, with both rates being significantly above chance (Whelan et al., 2015). Therefore, limited research suggests that lies told in low- or high-stakes scenarios have a meaningful association with how likely they are to be detected.

In addition to varying accuracy rates, there appears to be conflicting evidence to suggest whether individual differences influence the ability to detect deception. Aamondt & Custer (2006) examined 108 studies and found that demographic variables, such as age, experience, education, and sex, were not significantly related to accuracy in detecting deceit. Surprisingly, the researchers found that participants in occupations that frequently encounter deception (e.g., detectives, judges, and psychologists) were no better at correctly identifying lies than other civilians (e.g., students). In contrast, other studies have found that certain groups do detect deceit at a much higher rate. For example, Ekman & O'Sullivan (1991) found that Secret Service agents performed significantly better than chance, with a mean accuracy rate of 64%, and outperformed federal polygraphers, robbery investigators, judges, psychiatrists, and college students. Further, Ekman, O'Sullivan, & Frank (1999) demonstrated that other law-enforcement groups, such as sheriffs and federal judges (who had an accuracy rate of 66% and 62%, respectively), and clinical psychologists with a special interest in deception (who had an accuracy rate of 67%) also performed significantly better than chance. Although stable demographic variables may not be associated with detecting deception, it appears that some aspect of being in particular professions may be tied to an increased accuracy rate.

Professionals' superior performance may partially be due to elements of their training (Ekman & O'Sullivan, 1991). Indeed, comprehensive and empirically based deception detection training has been shown to increase accuracy rates. For example, Shaw, Porter, and ten Brinke (2013) demonstrated that training mental health and legal professionals increased their accuracy rates from a mean of 46.4% to an impressive 80.9%. The researchers used a holistic strategy, including information on verbal, body language, and facial expression cues associated with lying (Porter & ten Brinke, 2010). They also considered the six major criteria seen as integral to an

effective training program (see Frank & Feeley, 2003). Those who detect deception at chance level appear to be amenable to change if the right intervention strategy is employed.

1.4 The Dark Triad

Though proven effective, training programs may not increase deception detection accuracy rates for a subset of the population. This may include the Dark Triad: a set of three personality constructs subclinical psychopathy, Machiavellianism, and subclinical narcissism (Paulhus & Williams, 2002). The development of non-clinical measures of all three constructs allowed researchers to evaluate empirical associations among them in normal populations. Paulhus and Williams (2002) analyzed the relationships among the Dark Triad constructs and how it correlated with the well-known Big Five personality traits: extraversion, agreeableness, conscientiousness, neuroticism, and openness (John & Srivastava, 1999). They found that the Dark Triad traits had a commonality among the Big Five personalities: low agreeableness. It has also been demonstrated that although, psychopathy, Machiavellianism, and narcissism, are related to one another, they are a distinct collection of traits that each represents a different aspect of a dark personality (Jonason, Koenig, & Tost, 2010; Lee & Ashton, 2005; Paulhus & Williams, 2002). Individuals who possess characteristics of any of the personalities from the Dark Triad have a malevolent undertone, are likely to be callous, and act in ways that are self-serving (Lee & Ashton, 2005). Having traits within this collection of personality constructs increases a person's likelihood of engaging in antisocial behaviour, such as pathological lying.

1.4.1 Psychopathy

Psychopathy is a personality disorder characterized by poor interpersonal skills (e.g., being deceitful and exploitative), blunted affect (e.g., the inability to feel empathy and/or remorse), and

behavioural problems (e.g., being impulsive and committing crimes) (Hare, 2003; Hare & Neumann, 2008; Porter, Woodworth, & Black, 2016). Personality characteristics typically associated with psychopathy are high impulsivity and sensation seeking, low empathy and anxiety, and emotional callousness (Hare, 2003).

Psychopaths are believed to have an affective deficit that impedes their ability to recognize and understand the emotional expressions of others (Blair et al., 2004; Del Gaizo & Falkenbach, 2008; Dolan & Fullam, 2006; Malterer, Glass, & Newman, 2008). For example, Brook and Kosson (2012) found that empathic accuracy was inversely related to psychopathy scores among a sample of institutionalized male offenders when they were asked to identify facial expressions as the faces altered from an affective-laden expression to a neutral expression. Additionally, some have proposed that psychopaths are unable to fundamentally feel human emotions themselves (Anderson & Stanford, 2012; Hare, 2003). In summary, this affective deficit may be displayed as a lack of overall empathy, the inability to recognize and feel the emotions of others (Rogstad & Rogers, 2008).

In addition to having an emotional deficit, psychopaths seem to have little or no conscience (Hare, 2006). The absence of a sense of morality, which inhibits most people from acting on unethical thoughts, allows them to engage in a wide range of antisocial behaviour and criminal acts that often are violent in nature (Hare, 2006; Jones & Miller, 2012). Additionally, psychopaths often are antagonistic and aggressive, and have little reservations about manipulating others (Seibert, Miller, Few, Zeichner, & Lynam, 2011). This inclination for crime and the inability to feel guilt for their actions or empathy for their victims may enable psychopaths to be experienced deceivers who are easily able to take advantage of others to serve themselves.

1.4.2 Machiavellianism

In *The Prince*, Niccolò Machiavelli (1469–1527) described manipulative, amoral, and deceptive behaviour as necessary to achieve power in politics (see Kessler et al., 2010). These are the core characteristics, which researchers such as Christie and Geis (1970), used to define and create a scale to measure the personality construct of Machiavellianism. The current conception of Machiavellianism would include someone who is manipulative and more interested in him or herself than others (Rauthmann, 2013). Since Machiavellians have negative worldviews about others, they have been found to distance themselves from interpersonal relationships (Christie & Geis, 1970). However, there is also evidence to suggest that they can be quite charming if they think it will bolster their chances of success when manipulating others. For example, Machiavellians have been associated with using charm as a manipulation tactic in the workplace (Jonason, Slomski, Partyka, 2012). It appears that an individual high on Machiavellianism would be willing to use deception and manipulation if it will benefit him or herself and would be unconcerned about the consequences for their victims.

Machiavellianism has been strongly related to alexithymia, a disorder that is characterized by the inability to feel empathy for others (Picardi, Toni, & Caroppo, 2005). Wastell and Booth (2003) examined the relationship between Machiavellianism and alexithymia in a large sample of university students. Results revealed that people who scored higher on Machiavellianism had increased difficulty identifying and comprehending the emotions of others. Similarly, Sutton, Smith, and Swettenham (1999) revealed that Machiavellians might not possess the ability to feel full empathy for others, but are able to experience cognitive empathy (or the ability to recognize and comprehend the emotions of others but not experience them oneself). Both of these studies imply that Machiavellians lack empathy for their victims. Similar

to psychopaths, Machiavellians' ability to dupe others without feeling guilt allows them to be prolific deceivers.

1.4.3 Narcissism

Narcissism is a personality construct that consists of feelings of grandiosity, self-love, and inflated views of self-importance (Campbell, Brunell, & Finkel, 2006). Individuals with narcissistic characteristics perceive themselves to be dominant, grandiose, entitled and superior to others (Menon & Sharland, 2011; Paulhus & Williams, 2002). Pathological narcissists possess such a high level of grandiosity and self-absorption that is likely to lead them to exhibit arrogant attitudes. Narcissists may treat other people in a demeaning way and engage in interpersonal behaviours characterized by exploitativeness because they think it is their right as a superior being (Ackerman et al., 2011). Their desire for admiration and power allows narcissists to experience a low degree of empathy and to be manipulative in interpersonal relationships (Campbell, Hoffman, Campbell, & Marchisio, 2011).

Similar to the other two personality constructs associated with the Dark Triad, narcissists lack empathy for others. Their self-obsession has been linked to viewing others as a means through which their need for admiration and confirmation of self-views can be attained (Campbell, Reeder, Sedikides, & Elliot, 2000; Watson & Morris, 1991). Fan and colleagues (2011) demonstrated that neurological evidence exists for an empathy deficit in the minds of narcissists (through the use of fMRI). Specifically, individuals higher on narcissism exhibited less neural activity in the right anterior insula, an area of the brain related to emotion regulation and social experience. Individuals who displayed less activation in this brain area also scored higher on a measure of alexithymia.

Despite evidence demonstrating that narcissists possess a low degree of empathy (particularly when compared to normal controls), research has shown that narcissists have the highest capacity for empathy in relation to the other personalities of the Dark Triad (Wai & Tiliopoulos, 2012). A higher level of empathy would be necessary to be able to perceive the emotions of others in order to reinforce the narcissists' self-esteem and need for admiration (Wai & Tiliopoulos, 2012). For example, Vonk, Zeigler-Hill, Mayhew, and Mercer (2013) found that those scoring high in grandiosity also had a high capacity for emotional intelligence and perspective taking. Moreover, individuals scoring high in grandiosity likely need constant reinforcement that they are superior and would need to be able to read interpersonal cues to confirm that others perceived them to be important. Similar to Machivallians, there is some research to show that narcissists may be able to pay attention to others if it suits self-serving needs, such as their need for flattery (Wai & Tiliopoulos, 2012). Like the other two dark personalities in the triad, relatively low levels of empathy allows narcissists to engage in more deception because they may feel superior, instead of guilty, for lying to others.

1.5 The Dark Personalities and Deception

As mentioned previously, seminal work by DePaulo and colleagues (1996) highlighted how prominent deception is in daily life. Serota and Levine (2015) expanded on this work and confirmed that most people tell just over one "small lie" every day and approximately one "big lie" once a week. However, their results also revealed that there are prolific liars who tell almost three big lies a day in addition to the six small lies they tell on average a day. Perhaps, a subset of prolific liars includes those high on the Dark Triad traits. Indeed, dark personalities have been strongly associated with a higher propensity for deception (Azizli et al., 2016), including an

increased frequency of telling lies in general, lies for self-gain, and lying for no obvious reason (Jonason, Lyons, Baughman, & Vernon, 2014).

In addition to lying more often, dark personalities perceive themselves to be superior deceivers. All Dark Triad personalities believe they are more successful at deception than the average person in a wide variety of situations, with one study demonstrating that Machiavellianism was the most highly associated with a perceived ability to deceive, followed by psychopathy and then narcissism (Giammarco, Atkinson, Baughman, Veselka, & Vernon, 2013). The authors suggested that the increased confidence in deception observed in Machiavellian individuals is partly due to engaging in the behaviour more often. Similarly, people who score high on psychopathy have also reported an inflated perception of their deceiving capabilities (Jonason et al., 2014). Klaver, Lee, and Hart (2007) found that those with higher scores on the interpersonal facet of psychopathy, in particular, have superior views of their lying ability. Deceptive ability, whether or real imagined, appears to be very important to the psychopathy construct; so much so, that there are various test items on measures of psychopathy intended to quantify this perception (e.g., Paulhus, Neumann, & Hare, 2015), including two of the twenty characteristics that comprise the PCL-R (Hare, 2003). In comparison to the other two dark personality features, very little research has investigated narcissism and its association with an enhanced confidence in lying ability. Arguably, narcissists engage in positive self-deception, or holding positive beliefs about their abilities regardless of whether they are actually true, to uphold their sense of superiority and grandiosity (Wright, Berry, Catmur, & Bird, 2015). Lamba and Nityananda (2014) demonstrated that those who engage in self-deception, by displaying overconfidence about their academic grades, were better able to deceive their peers as evidenced by their peers overestimating the self-deceptive person's grades. The

authors suggest that individuals who engage in self-deception may be better deceivers because they are less likely to produce cues, such as stress or other behaviours that may reveal they are engaging in deception. Dark Triad individuals may see themselves as master deceivers, but does that translate to how other people perceive them?

Although all three dark personality features frequently engage in deception and believe they are good at it, the ways in which they are perceived by their targets varies greatly. Early research from Geis and Moon (1981) found that those who scored high on Machiavellianism were more believed when lying by naïve judges than those scoring lower. There were no significant differences between those low and high on Machiavellianism when telling truth, but high Machiavellian individuals were perceived as significantly more persuasive with deception than their counterparts. One potential explanation is that Machiavellians and psychopaths may rely more heavily on their nonverbal behaviours (Fry, 1985; Klaver et al., 2007) in order to better deceive their targets. In particular, psychopathic individuals engage in more hand movements and body gestures (i.e., illustrators) as a means to augment their verbal content (Klaver et al., 2007). In order to seem more believable or sincere, psychopaths may also be better at feigning emotional facial expressions, such as remorse or sympathy (Book et al., 2015; Book, Visser, & Volk, 2015). In comparison to the other two dark personalities, the impressions narcissists' give to others appears to be not as effective. While narcissists may initially appear charming and be able to fool others, this positive light begins to darken more quickly overtime (Lamba & Nityanada, 2014; Paulhus, 1998). Paulhus (1998) investigated the perceptions people hold of individuals who score high on self-enhancement across time. At first, self-enhancers made positive impressions and were seen as agreeable, well adjusted, and competent. However, their peers gave them negative ratings after being exposed to them for seven weeks. As the targets

gained familiarity with the narcissists overtime, they began to see discrepancies between the cues self-enhancers were giving and their actual self. Perceptions of the dark personalities by others appear to indicate that at least initially they may have an advantage in deception, particularly with those they are not acquainted with.

While the Dark Triad may present with memorable first impressions and views themselves as successful liars, are they actually better at deception than their non-dark counterparts? Wright and colleagues (2015) examined the relationship between the Dark Triad and their ability to both produce and detect deceit. In a group of five, participants took turns providing true and false statements on social opinions. When a participant was not providing an opinion, he or she was rating whether the group member speaking was telling the truth or lying and rated his or her perceived credibility. Interestingly, Machiavellians, who rated lies as an acceptable behaviour, had a tendency to produce deceptive statements that were more difficult to discriminate from the truth. In contrast, narcissists, who scored higher on the trait of self-deception, were less likely to be believed by the other group members. However, no overall significant relationships were observed between any of the Dark Triad measures and performance on either producing or detecting lies.

1.6 Current Study

The current study sought to uncover how individuals change their language use across low- and high-stakes deception. The vast majority of the aforementioned research has focused on linguistic differences across individuals (or inter-subject variability) through the use of between-subject designs. In studies that have investigated intra-subject variability (differences within a person) through the use of within-subject designs, most have focused on either solely low-stakes

(e.g., Porter, Doucette, Woodworth, Earle, & MacNeil, 2008) or high-stakes deception (e.g., Frank & Ekman, 2004). Often, low-stakes lies are studied in laboratory settings (e.g., Newman et al., 2003; Van Swol & Braun, 2014; Zhou et al., 2004) whereas high-stakes lies are investigated in more real life settings (e.g., ten Brinke & Porter, 2012; McQuaid et al., 2015; Whelan et al., 2015). Further, the specific samples and contexts that have primarily been considered in previous studies make it difficult to see how verbal cues of low-stakes deception extends to more general high-stakes deception. The inclusion of both stakes within one methodological paradigm will allow us to make direct linguistic comparisons between low- and high-stakes deception.

There are some similarities and differences between low-stakes and high-stakes lies in the extant literature. In comparison to truths, some low-stakes studies have found that liars speak more (e.g., Zhou et al., 2004) whereas high-stakes studies have found that deceivers speak less (ten Brinke & Porter, 2012). Low-stakes lies have been found to include fewer personal pronouns than truths (DePaulo et al., 2003; Hancock et al., 2008; Newman et al., 2003), whereas high-stakes lies have not (McQuaid et al., 2015; ten Brinke & Porter, 2012). Similarly, more emotional words have been found in low-stakes deceptive discourse (Buller et al., 1996; DePaulo et al., 2003; Vrij, 2000; Zhou et al., 2004), but not for high-stakes lies (ten Brinke & Porter, 2012) relative to truths. Because the methodology in the present study allowed for direct comparisons between low-and high-stakes deception, the following was hypothesized:

H1: Verbal features that have generally been found to be indicative of deception in the past, such as a lower word count, fewer personal pronouns, and more negative affect words will be observed in both low- and high-stakes lies in comparison to honest speech. Additionally, I hypothesized that deceptive linguistic cues will be more pronounced in high-stakes lies relative

to low-stakes lies because of the increased cognitive effort and emotions typically felt in high-stakes situations.

Another goal of the current study was to further explore the relationship between individuals high on Dark Triad constructs and deception. Psychopathy (Hare, 2003), Machiavellianism (Picardi et al., 2005), and narcissism (Fan et al., 2005) have all been associated with having a lower capacity for empathy. Therefore, the powerful emotions (e.g., guilt, shame) that typically accompany telling high-stakes lies (ten Brinke & Porter, 2012) may not be felt as strongly by Dark Triad individuals in comparison to those who score lower on the dark constructs. In relation to the affect felt in low- and high-stakes scenarios, it was hypothesized that:

H2: Individuals who are lower on dark personality traits will feel more negative affect in the high-stake situation relative to the low-stake situation. Whereas, high Dark Triad individuals will experience less negative emotions in both low- and high-stakes scenarios than those who score lower on the Dark Triad.

Further, it has been established that Dark Triad individuals have an increased proclivity towards deception (Azizli et al., 2016; Jonason et al., 2014). Despite engaging in lying more often, dark personalities have been shown, more often than not, to be no more successful at deceiving others than other individuals (Wright et al., 2015). In regards to deceptive ability, it was hypothesized that:

H3: Dark Triad individuals will be no better at deceiving than those who score lower on the dark personalities.

Chapter 2: Methods

2.1 Participants

The participants were 71 undergraduate students; one undisclosed, 19 men ($M = 20.80$ years, $SD = 3.76$) and 51 women ($M = 20.90$ years, $SD = 3.42$) from the University of British Columbia Okanagan campus. Caucasian students made up 69.0% of the sample, 14.1% of the sample was Asian, 2.8% identified as African-Canadian, and 14.1% of the sample identified as an “other” race. In relation to the participant’s level of education, 50.7% of participants were in their first or second year of school, 40.9% were in their third or fourth year, and 8.5% were enrolled in a fifth year. Students participated in the study in return for course credit.

2.2 Materials

2.2.1 Social Issues

This questionnaire was created specifically for use in the current study. Ten social issues served as potential topics that participants could discuss in the main study. The questionnaire was adapted and modeled after the survey used in the false opinion paradigm by Frank and Ekman (1997). These ten topics were chosen because they were determined to be social issues that many people hold strong opinions for and reflected current political and social affairs. Participants rated on a 7-point likert scale whether they *strongly disagreed* (1) or *strongly agreed* (7) with each social issue (see Appendix A). Participants were given the questionnaire prior to coming into the laboratory. All participants were instructed to give their honest opinions on the questionnaire.

2.2.2 Self-Report Psychopathy Scale-III (SRP-III)

The SRP-III is a self-report questionnaire that taps into the four facets of psychopathy: callous affect, criminal tendencies, erratic lifestyle, and interpersonal manipulation (Paulhus, Neumann, & Hare, 2015; Williams, Paulhus, & Hare, 2007). The SRP-III includes 64-items and employs a 5-point Likert-type scale (from *strongly disagree* to *strongly agree*). Scores are summed after reverse scoring designated items (Paulhus et al., 2015). Scores for the 16 items in each subscale are then averaged to get a mean. The mean of the four subscales then serves as the SRP-III total score. The total score is out of 5, where a higher number corresponds to a higher level of psychopathy.

Self-reporting has been found to be a reliable method of assessing psychopathy (Miller, Jones, & Lynam, 2011). The SRP-III has been shown to have good convergent and discriminant validity (Forth, Brown, Hart, & Hare, 1996; Paulhus et al., 2015; Williams & Paulhus, 2004). The SRP-III was created for use with community samples and has been found to have a four-factor structure similar to the PCL-R, deemed to be the gold standard assessment for forensic samples (Mahmut, Menictas, Stevenson, & Homewood, 2011). Additionally, the SRP-III has been found to significantly correlate with other self-report measures of psychopathy (Seibert, Miller, Few, Zeichner, & Lynam, 2011). In summary, the SRP-III captures the core components of psychopathy.

2.2.3 MACH-IV

Machiavellian traits such as engaging in manipulation, deceit, and self-interested behaviour (Paulhus & Williams, 2002) were assessed by the MACH-IV. The MACH-IV is a 20-item questionnaire that uses a 7-point Likert-type scale (from *strongly disagree* to *strongly agree*) to

assess the nature of an individual's interpersonal tactics, views on human nature, and abstract or generalized morality (Christie & Geis, 1970). The scores are summed after reverse scoring specific items inversely related to Machiavellianism. Although there is research that has raised some concerns with the factors underlying the measure (Panitz, 1989), the MACH-IV has been shown to be a reliable and valid scale (Jones & Paulhus, 2009; Ramanaiah, Byravan, & Detwiler, 1994). The MACH-IV has given rise to newer forms of the measure (Rauthmann, 2013) and strongly correlates with other measures that assess Machiavellianism (Mudrack & Mason, 1995); the MACH-IV accurately reflects the construct of Machiavellianism.

2.2.4 Narcissistic Personality Inventory (NPI)

The NPI is a 40-item forced choice questionnaire that measures characteristics of narcissism, such as grandiosity, entitlement, dominance, and superiority (Raskin & Hall, 1979; Raskin & Terry, 1988). One point is given for each narcissism-related item, for a maximum score of 40. A higher score on the NPI is associated with having more narcissistic traits. The NPI significantly overlaps with other measures that assess narcissism in clinical samples (Ryan, 1984; Miller, Gaughan, Kame, & Campbell, 2009), suggesting it is accurately examines the construct of narcissism. Despite differing views on its factor structure (Corry, Merritt, Mrug, & Pamp, 2008), the NPI is the most widely utilized measure of narcissism (Ackerman et al., 2011).

2.2.5 Positive and Negative Affect Schedule (PANAS)

The PANAS (Watson, Clark, & Tellegen, 1988) consists of twenty items that provide brief measures of positive and negative affect. Respondents were asked to rate the extent to which they had experienced each particular emotion within a specific time period on a 5-point likert

scale. The specific time frame used for the study was '*in the present moment*'. The PANAS was administered at the beginning and end of each session.

2.2.6 Linguistic Inquiry Word Count (LIWC)

The 2015 version of the Linguistic Inquiry Word Count (LIWC; Pennebaker, Boyd, Jordan, & Blackburn, 2015) program was utilized to analyze the linguistic pattern of all truths and lies. LIWC codes and separates speech content into distinct psychologically meaningful categories (Tausczik & Pennebaker, 2010). LIWC dimensions range from standard linguistics (e.g., overall word count, adjectives, nouns) to such categories as personal concerns (e.g., insight, anxiety or fear, positive emotions, etc.). The 2015 version of LIWC included the addition of several new categories and summary variables (e.g., clout, emotional tone). Based on a dictionary of over 4000 words and word stems, LIWC counts the amount of words in each category and divides the sum by the word count. As a result, a percentage for each category is given which takes into account verbosity. The current study focused on selected linguistic categories shown to be associated with deception in previous research, such as – but not limited to – the use of pronouns (e.g., DePaulo et al., 2003; Hancock, Curry, Goorha, & Woodworth, 2008; Newman, Pennebaker, Berry, & Richards, 2003), negative emotion words (Buller et al., 1996, DePaulo et al., 2003; Vrij, 2000; Zhou et al., 2004), and word count (Van Swol & Braun, 2014; Zhou et al., 2004). LIWC has been proven to be psychometrically valid in both psychology and communication contexts (Pennebaker, 2011).

2.3 Procedure

Participants were told that they were going to participate in a study that was investigating student opinions on social issues. The study spanned across two sessions held one week apart. The

researcher contacted participants prior to the first session via email with a link to a survey that included the consent form, basic demographic information, the social issues questionnaire, and a number of personality trait measures, including the MACH-IV (a measure of Machiavellianism), the SRP-III (a measure of psychopathy), and the NPI (a measure of narcissism). These three measures were chosen to assess the characteristics of the Dark Triad.

In the first study session, the researcher explained the informed consent form orally and then the participants had the opportunity to ask any questions that they had prior to signing the form. All participants provided a low-stakes (LS) lie and truth in one session and a high-stakes (HS) lie and truth in a second session. Participants were randomly assigned to one of eight orders that were counterbalanced to account for order effects (see Table 2.1).

Table 2.1
All Possible Orders Opinions can be presented for Each Study Session

Order	Session 1	Session 2
1	LS truth, LS lie	HS truth, HS lie
2	LS lie, LS truth	HS truth, HS lie
3	LS truth, LS lie	HS lie, HS truth
4	LS lie, LS truth	HS lie, HS truth
5	HS truth, HS lie	LS truth, LS lie
6	HS truth, HS lie	LS lie, LS truth
7	HS lie, HS truth	LS truth, LS lie
8	HS lie, HS truth	LS lie, LS truth

LS = Low-Stakes, HS = High-Stakes

For low-stakes truths, participants were asked to give their honest opinion about one of the strongly endorsed social issues. Participants were instructed to “convince another person that this is your opinion on the social issue.” The other person was a confederate whom the

participant believed was judging whether the participant is telling the truth or a lie. The confederate was instructed to not converse with the participant and to hold a neutral facial expression throughout the participant's opinions. Participants were given five minutes to prepare their first opinion, after which a confederate came into the room to listen to the participant's opinion. The confederate then left the room and completed a brief questionnaire about the opinion the participant just presented and her perceptions of the participant. Specifically, the confederate rated whether she thought the opinion was a truth or a lie and how confident she was with her decision, as well as, how persuasive, dominant, engaging, nervous, and physically attractive she perceived the participant to be (see Appendix B). The participant was given another five minutes to prepare the false opinion for the low-stakes lie. The participant was given the same instructions as the LS truth and presented the false opinion to the confederate. After both opinions had been given, the participant completed a brief follow-up questionnaire on their perceptions of the convincingness of their opinions (see Appendix C).

In the high-stakes session, participants were told that if the confederate caught them lying on the HS lie opinion, they would have to do an extra twenty minute tedious task (such as counting the number of times the letter "M" appears in a string of letters) in a cramped, darkened room as punishment. They were told that they would be subjected to 10 to 40 randomly sequenced 110dB startling blasts of white noise over the course of the task. A video of the punishment task was shown to the participant. This paradigm was adapted from a prior study (see Frank & Ekman, 1997). Participants were told that if they successfully deceived the confederate with their lie (such that the confederate thought they were telling the truth), they would not have to participate in this extra task and would receive extra course credit without having to do anything. The extra bonus credit served as a 'reward' as it was equivalent to saving

30 minutes of the participants' time which they would have spent doing the tedious task if they were caught deceiving by the confederate. In reality, all participants were granted the total amount of credits and none actually engaged in the punishment task.

Chapter 3: Results

3.1 Statistical Analyses

Descriptive statistics (e.g., means, standard deviations, and ranges) for the Dark Triad measures were calculated. Correlations among the Dark Triad measures were also explored. Descriptive statistics were also reported for each social issue. To address the first hypothesis, a series of paired sampled *t* tests were run on linguistic variables shown to be associated with deception in past research: assent and negation terms, perceptual processes (e.g., see, hear, feel), affect, negative emotion words, emotional tone, disfluencies and filler words, personal pronouns, word count. For analyses that compared language across low- and high-stakes sessions, univariate Analyses of Variance (ANOVAs) were conducted to determine whether linguistic differences were due to the nature of the topic discussed. To test the second hypothesis, paired sampled *t* tests were conducted to determine whether there were significant differences between emotions felt at the beginning and at the end of low- and high-stakes sessions. Difference scores were also calculated for all emotion ratings for low- and high-stakes session and correlated with Dark Triad measures to see if dark personalities experienced a different pattern of emotions than those who score lower on the constructs. To address the third hypothesis, the confederate's deception detection accuracy rates were reported. Then, a multiple regression was also used to test if Dark Triad traits significantly predicted the confederate's accuracy ratings. Finally, correlations between the Dark Triad and self-report and confederate ratings were executed.

3.1.1 General Data Cleaning

Two participants did not complete both sessions and as a result had missing data. Since the participants did not have data for half the variables, they were removed from the dataset. After dealing with missing data, the dataset was examined for normality. The SRP-III total score ($W=.96, p < .05$) and the NPI ($W=.95, p < .05$) was positively skewed, suggesting there was a larger number of participants scoring at the low end of the measures. The MACH-IV, however, was normally distributed ($W=.99, p > .05$) indicating that there was a full range of scores on the measure. **3.2 Preliminary Statistics**

3.2.1 Dark Triad Scales

All participants completed the SRP-III, NPI, and MACH-IV. The three personality measures (NPI, MACH-IV, and the SRP-III) were scored individually according to their respective scoring requirements. The relationship between these three personality constructs was assessed using correlations and results showed that the three were significantly correlated at .37, .60, and .67 ($p < .05$). The highest correlation was only .67, which suggests that while these constructs are related they are distinct, constructs that measure different aspects of personality (Jonason et al., 2010; Paulhus & Williams, 2002).

Reliability of the scales was 0.93, 0.86, and 0.76 (Cronbach's alpha) respectively. As reliabilities were above the commonly used acceptable cutoff of 0.70 (Nunnally & Bernstein, 1994), all scales were used as variables in further analyses.

The mean score on the SRP-III for the overall sample was 2.19 ($SD = 0.45$), with total scores ranging from 1.31 to 3.58. The mean score on the NPI for the overall sample was 14.44 ($SD = 7.09$), with total scores ranging from 3 to 34. The mean score on the MACH-IV for the

overall sample was 3.54 ($SD = 0.64$), with total scores ranging from 2.10 to 5.25 (a further breakdown of means, standard deviations, and ranges by gender is provided in Table 3.1).

Table 3.1

Means, Standard Deviations, and Ranges for SRP-III, NPI, and MACH-IV Total Scores for the Overall Sample, Males, and Females

Sample	SRP-III	NPI	MACH-IV
Overall $M (SD)$	2.19 (0.45)	14.44 (7.09)	3.54 (.62)
Range	1.31-3.58	3-34	2.1-5.25
Males $M (SD)$	2.47 (0.45)	18.21 (6.99)	3.82 (0.69)
Range	1.61-3.58	5-34	2.1-5.25
Females $M (SD)$	2.09 (0.41)	13.09 (6.74)	3.41 (0.58)
Range	1.31-3.44	3-34	2.1-5

SRP-III = Self-Report Psychopathy Scale, NPI = Narcissistic Personality Inventory, MACH-IV = Machiavellian Scale.

3.2.2 Key Variables

Correlations between SRP-III, NPI, MACH-IV, and the demographic variables were examined.

Significant results are presented in Table 3.2 (demographic variables with no relationship to SRP-III, NPI, or MACH-IV are not included). As expected, the three scales that make up the Dark Triad were highly correlated with one another. In terms of demographic variables, being male was significantly related to higher SRP-III total scores, and NPI Total scores, but not with MACH-IV scores. No significant relationships were found between age, sexual orientation, level of education and number of psychology courses taken.

Table 3.2
Pearson Bivariate Correlations Between Primary Study Variables

	1	2	3	4
1. SRP-III	1	.60*	.67*	-.38*
2. NPI		1	.37*	-.32*
3. MACH-IV			1	-.20
4. Gender				1

SRP-III = Self-Report Psychopathy Scale, NPI = Narcissistic Personality Inventory, MACH-IV = Machiavellian Scale.

* significant at the $p = .01$ level

3.2.3 Social Issues

Means, standard deviations, and range of scores for all social issues are listed in Table 3.3. There was a wide range of scores among for each opinion. Additionally, the means for most of the social issues fell within the mid-range of the rating scale.

Table 3.3
Descriptive Statistics for Social Issues

Social Issue	Mean (SD)	Range
Convicted murderers should be executed.	3.14 (1.65)	1-6
Universities should be allowed to raise tuition to enable further growth.	3.25 (1.43)	1-6
Global warming is a serious problem.	6.30 (1.02)	1-7
Marijuana should be legalized.	5.28 (1.67)	1-7
People on welfare are just taking advantage of the system.	2.79 (1.44)	1-6
Medical testing on animals is acceptable.	3.28 (1.88)	1-7
Human cloning should be permitted	3.11 (1.74)	1-7

Social Issue	Mean (SD)	Range
Concerns over terrorism justify racial profiling.	2.55 (1.91)	1-7
The decreasing value of oil is a good thing for Canada in the long run.	3.63 (1.50)	1-7
The threshold for successful immigration applications and refugee applications should be made more lenient.	4.38 (1.52)	1-7

As mentioned previously, participants told a truth and a lie on a different topic for each session.

Table 3.4 shows the number of times each social issue was discussed in both low- and high-stakes sessions.

Table 3.4

Frequency of Social Opinions Discussed for Low- and High-stake Sessions

Social Issue	Low-Stakes	High-Stakes
Convicted murderers should be executed.	2	8
Universities should be allowed to raise tuition to enable further growth.	5	6
Global warming is a serious problem.	16	17
Marijuana should be legalized.	9	12
People on welfare are just taking advantage of the system.	7	5
Medical testing on animals is acceptable.	4	8
Human cloning should be permitted	7	4
Concerns over terrorism justify racial profiling.	8	4
The decreasing value of oil is a good thing for Canada in the long run.	6	4
The threshold for successful immigration applications and refugee applications should be made more lenient.	7	3

3.3 Linguistic Analyses

3.3.1 Language Differences between Low-Stakes Lies and Truths

There were no significant differences between how convincing participants reported to be when telling low-stakes lies ($M = 5.70, SD = 1.45$) versus low-stakes truths ($M = 5.99, SD = 1.15$), $t(70) = 1.61, p > .05$. A series of paired samples t test were conducted to investigate linguistic differences between low-stakes lies and truths. Results revealed that there was a significantly higher word count in low-stakes truths ($M = 128.42, SD = 104.27$) than low-stakes lies ($M = 108.03, SD = 76.23$), $t(70) = 2.94, p = .004$. Participants also used more emotional tone ($M = 53.69, SD = 34.91$) in low-stakes lies than in low-stakes truths ($M = 42.68, SD = 31.57$), $t(70) = 2.20, p = .03$. There was more usage of personal pronouns in low-stakes lies ($M = 7.18, SD = 3.78$) than in low-stakes truths ($M = 6.04, SD = 3.48$), $t(70) = 2.96, p = .004$.

3.3.2 Language Differences between High-Stakes Lies and Truths

Participants reported trying to be more convincing when telling high-stakes lies ($M = 6.21, SD = 1.15$) in comparison to high-stakes truths ($M = 5.69, SD = 1.54$), $t(70) = 2.96, p = .004$. Results revealed that there was a significantly higher word count in high-stakes lies ($M = 147.21, SD = 102.19$) than high-stakes truths ($M = 131.21, SD = 85.94$), $t(70) = 2.17, p = .03$.

3.3.3 Language Differences between Low- and High-Stakes Lies

Participants reported trying to be more convincing when telling high-stakes lies ($M = 6.21, SD = 1.15$) in comparison to low-stakes lies ($M = 5.70, SD = 1.44$), $t(70) = 2.52, p = .01$. There was a significantly higher word count in high-stakes lies ($M = 147.21, SD = 102.19$) than in low-stakes lies ($M = 108.03, SD = 76.22$), $t(70) = 4.27, p < .001$. More emotional tone was found in low-stakes lies ($M = 53.69, SD = 34.91$) than in high-stakes lies ($M = 41.65, SD = 34.12$), $t(70) =$

2.22, $p = .03$. Death-related words were also used more frequently in high-stakes lies ($M = .56$, $SD = .155$) than in low-stakes lies ($M = .11$, $SD = .41$), $t(70) = 2.30$, $p = .03$.

Univariate ANOVAs were conducted on the significant findings mentioned above to determine whether the linguistic differences were due to the nature of the topic. There was no main effect for word count in low-stakes topics, $F(1,9) = .86$, $p > .05$, suggesting that word count did not vary significantly across the different topics for low-stakes lies ($M = 108.03$, $SD = 76.22$). There was also no main effect for word count in high-stakes topics, $F(1,9) = .98$, $p > .05$, suggesting the word count did not vary significantly across the different topics for high-stakes lies either ($M = 147.21$, $SD = 102.19$). There was a main effect for emotional tone in low-stakes lies, $F(1,9) = 2.81$, $p = .008$, and in high-stakes lies, $F(1,9) = 3.85$, $p = .001$, suggesting that emotional tone significantly varied across topics. A main effect was found for death-related words in low-stakes lies, $F(1,9) = 5.78$, $p < .001$, and in high-stakes lies, $F(1,9) = 28.01$, $p < .001$, suggesting that death-related words significantly varied across topics.

3.4 Affect

3.4.1 Emotion Ratings in Low- and High-Stakes Sessions

Each participant completed the PANAS at the beginning and end of each low-stake and high-stake session (see Appendix D for means, standard deviations, and ranges on the PANAS). A series of paired-samples t tests were conducted to determine whether there were significant differences between emotions felt at the beginning and the end of the *low*-stakes session. It was found that participants reported feeling more guilty, $t(70) = 2.67$, $p = .009$, more jittery, $t(70) = 3.25$, $p = .002$, but less scared, $t(70) = 2.48$, $p = .02$, on average at the end of the session than at the beginning.

Similar paired-samples t tests were also conducted to investigate whether there were significant differences between emotions felt at the beginning and at the end of the *high-stakes* session. It was found that participants reported feeling more afraid, $t(70) = 3.26, p = .002$, more ashamed, $t(70) = 4.20, p < .001$, more distressed, $t(70) = 3.04, p = .003$, more excited, $t(70) = 2.00, p = .05$, more guilty, $t(70) = 4.41, p < .001$, more interested, $t(70) = 3.60, p = .001$, more jittery, $t(70) = 4.63, p < .001$, more nervous, $t(70) = 3.04, p = .003$, more scared, $t(70) = 2.27, p = .03$, and less strong, $t(70) = 2.01, p = .05$, on average at the end of the session than at the beginning.

Difference scores (subtracting the ratings at the end of the session from the beginning of the session) of each emotion were calculated for both the low- and high-stakes session. A series of analyses of variances showed that the order in which truths and lies and low-stake and high-stake sessions occurred did not have an effect on these difference scores. Tests were conducted using Bonferroni adjusted alpha levels of .001 per test (.05/40). In low- and high-stakes, the effect of order was not significant for all emotions measured, $F(7,63) = .43-2.02, p > .02$.

3.4.2 Dark Triad and Affect

Dark Triad measures (SRP-III, NPI, and MACH-IV) were each correlated with the difference scores of each emotion in both the low- and high-stakes session. There were no significant correlations between these emotional difference scores and the Dark Triad measures. In other words, dark personalities experienced a similar pattern of emotions in both low- and high-stake sessions as those who scored low on the Dark Triad.

3.5 Confederate Ratings of Deception and the Dark Triad

3.5.1 Deception Detection Accuracy

One female confederate was present for all sessions. After listening to both opinions in each session, the confederate rated whether she thought each opinion was a truth or a lie. The confederate was accurate 76.1% of the time when evaluating the opinions in the low-stakes scenario and 70.4% of the time in the high-stakes scenario. A paired samples t test revealed that the accuracy rate between low- and high-stakes situations were not significantly different from each other, $t(70) = 0.75, p > .05$.

A chi-square test of independence was performed to examine the relation between the order effects and deception detection accuracy rates. As mentioned previously, there were eight possible combinations of truth and lies and low- and high-stake scenarios that participants could have done (see Table 2.1). The relation between the order and accuracy rates were not significant for both low-stake opinions, $\chi^2(7, N = 71) = 1.51, p > .05$, and high-stake opinions, $\chi^2(7, N = 71) = 3.44, p > .05$.

3.5.2 Dark Triad as Predictors of Confederate's Accuracy

After each opinion, participants rated whether they tried their best to be as convincing as they could. Correlations between SRP-III, NPI, MACH-IV and each of these ratings were examined (see Table 3.5).

Table 3.5*Correlations Between Dark Triad Measures and Ratings of Convincingness for Each Opinion*

	SRP-III	NPI	MACH-IV
Low-stakes Lie	.04	-.05	.27*
Low-stakes Truth	.05	.05	.11
High-stakes Lie	-.15	-.10	-.04
High-stakes Truth	-.33*	-.11	-.28*

SRP-III = Self-Report Psychopathy Scale, NPI = Narcissistic Personality Inventory, MACH-IV = Machiavellian Scale.

* significant at the $p < .05$ level

A multiple regression was used to test whether Dark Triad traits significantly predicted the confederate's accuracy ratings of low-stakes opinions. It was found that psychopathy ($\beta = .08, p > .05$), Machiavellianism ($\beta = .02, p > .05$), and narcissism ($\beta = -.01, p > .05$) were not significant predictors of the confederate's accuracy ratings in the low-stakes session. The results were insignificant, $F(3, 67) = 0.39, p > .05$ and produced an R^2 of .017.

Another multiple regression analysis was computed to test whether Dark Triad traits significantly predicted the confederate's accuracy ratings of high-stakes opinions. Similarly, it was found that psychopathy ($\beta = -.03, p > .05$), Machiavellianism ($\beta = -.08, p > .05$), and narcissism ($\beta = -.01, p > .05$) were not significant predictors of the confederate's accuracy ratings in the low-stakes session. The results of this analysis were also insignificant, $F(3, 67) = 0.94, p > .05$, and produced an R^2 value of .04.

3.5.3 Confederate Perceptions of the Dark Triad

After each opinion, the confederate rated how confident she was in her decision of whether or not the participant was lying, as well as her perceptions of how persuasive, engaging, dominant

and nervous the participant seemed. There were no significant correlations between the Dark Triad self-report measures and the confederate's ratings in both the low-stakes opinions and high-stakes opinions (see Appendix E for all correlations).

Chapter 4: Discussion

The current study sought to examine whether verbal cues of deception were apparent in comparison to honest speech as well as whether they were significantly more pronounced in high-stakes in comparison to low-stakes situations. Additionally, the present study investigated whether those possessing characteristics of the Dark Triad experienced less negative emotions in low- and high-stakes scenarios in comparison to those who score lower on dark personality traits. Finally, Dark Triad individuals were examined to see if they were more successful at deception.

4.1 Affect in Low- and High-Stakes Scenarios and its Relation to the Dark Triad

Some researchers have argued “high-stakes liars” in laboratory settings would not exhibit behaviours that most people associate with deception in more natural settings for several reasons (Vrij & Mann, 2001; Mann, Vrij, & Bull, 2002). First, they suggest that the participant would feel no real guilt for deceiving the target because he or she has been asked to lie. Second, the participant would most likely be made aware that they are being recorded and might modify their behaviour accordingly. Lastly, laboratory researchers cannot ethically offer a substantial punishment as motivation and so participants are telling lies of negligible consequence (Mann et al., 2002). However, the stakes manipulation in the current study showed evidence of effectively changing the participants' emotions in a number of ways. Overall, the participants only felt guiltier, more jittery, and less scared at the end than at the beginning of the low-stakes session. In contrast, participants felt a larger array of primarily negative emotions in the high-stakes session. Specifically, participants felt more distressed, upset, guilty, scared, ashamed, nervous, jittery,

afraid and less strong, and also reported being more interested and excited at the end in comparison to the beginning of the high-stakes session. The stakes manipulation employed appeared to arouse feelings typically felt by high-stakes liars in real-world situations (ten Brinke & Porter, 2012) even without the presence of real-world high-stakes consequences (e.g., incarceration).

For dark personalities, lies may not be associated with a variety of negative emotions to the same extent as those who score lower on these traits. In fact, some personalities have been shown to experience positive emotions when lying. For example, “duping delight” is gaining satisfaction for outwitting or conning another individual (Ekman, 1991; Spidel, Herve, Greaves, & Yuille, 2011). Those scoring high on psychopathy have been found to experience more pleasure from lying. It has been proposed that psychopathic individuals will engage in lying as a form of sensation seeking and that they may find it thrilling to con others when they are bored (e.g., Ford, 1996). People higher on psychopathy and other dark personalities were hypothesized to experience less negative emotion in both low- and high-stakes sessions. However, the present study did not provide evidence to suggest that Dark Triad individuals experienced a different pattern of emotions when they were lying.

There are a couple of reasons why feeling less negative affect was not observed among Dark Triad individuals during low- and high-stakes lying scenarios. First, it is possible that “duping delight” may only be derived from spontaneous lies and that being instructed to lie may have taken the fun out of the act. Second, the thrill of conning others may only occur when people get to *see* their target getting duped. Without any sort of facial or verbal feedback from the target, participants did not receive any cues to infer whether they were succeeding. Dark

Triad individuals may only gain satisfaction from the act of lying if they can find evidence to support their perceptions that the target was actually deceived.

4.2 Language Differences Between Truths and Lies of Varying Stakes

The current unique study observed the same person and their language across low-stakes *and* high-stakes, allowing us to make comparisons between and within the two scenarios. As previously discussed, participants' emotions in low-stakes and high-stakes sessions were significantly different from each other, confirming that the two scenarios were indeed dissimilar. Since emotional experiences were different, meaningful language comparisons can be made between low- and high-stakes scenarios.

A number of linguistic findings emerged. In particular, word count showed noteworthy variability across low- and high-stakes scenarios. More specifically, a higher word count was found for truths than lies in the low-stakes sessions, demonstrating that participants had a tendency to elaborate more on their truthful opinion. In everyday life, people communicate honestly most of the time and the presumption of honesty has been argued to be adaptive, enabling efficient communication, and cooperation (Levine, 2014). Further, the deception literature has consistently found that people hold a "truth bias" (Zuckerman, DePaulo, & Rosenthal, 1981) when detecting lies. That is, people are consistently more likely to assume a person is telling the truth *and* be more accurate in identifying truths than lies (e.g., Bond & DePaulo, 2006). Perhaps, people hold a truth bias because they tend to be more candid themselves and generalize this assumption onto their perception of others. Therefore, when participants spoke more when telling the truth in low-stakes sessions in the current study, it is likely related to perpetuating an honest disposition. Participants were more forthcoming by

sharing more information. In other words, this finding demonstrates that when individuals are in a truth-telling mindset, they felt no need to omit information or use equivocal language

In contrast, lies had a higher word count than truths in the high-stakes session. Additionally, across high- and low-stakes sessions, a higher word count was found in high-stakes lies when compared directly to low-stakes lies (and importantly this finding did not vary by the topic discussed). This suggests that, particularly when the stakes were higher, participants' shifted their focus to detailing their false opinion, which resulted in a higher word count. Using more words is contrary to what some past research has found. For example, pleader studies have found that people speak less when they deceive due to the increased cognitive load experienced by liars (e.g., ten Brinke & Porter, 2012). Although not coded for in the current study, one potential explanation for a higher word count seen in deceptive opinions may be the repetition of details, as this has been found in past research (e.g., Harpster et al., 2009). Repeating details could be a way for the deceiver to emphasize aspects of their lie to sound more confident to the confederate. Another possible explanation for the current study's findings is the perceived severity of the consequences. For example, in the pleader videos individuals are aware they are being recorded and that the consequences could involve something extremely serious (such as prison for a substantial period of time). People may become particularly tense and cautious due to the incredibly high stakes and speak less as a strategy to avoid future inconsistencies in their story. However, in the current study the consequences were certainly unappealing, but had a known duration of time (e.g., tedious task lasting twenty minutes), less caution is likely to be exhibited. It is also possible that when emotional arousal was heightened in the present study's high-stakes scenario, people became more verbose due to feelings of nervousness. Indeed, fear and anxiety have been found to be closely linked to rapid and louder speech (Siegman & Boyle,

1993). As a result, people may have spoken more and embellished their lies in an attempt to come across as more convincing specifically in the high stakes scenario.

The use of personal pronouns has been associated with deceptive discourse in the past. When comparing across sessions, specifically comparing low-stakes lies to high-stakes lies, no significant differences in personal pronoun usage were found. However, different patterns of personal pronoun usage emerged when comparing truths to lies within sessions. Like some past research (McQuaid et al., 2015; ten Brinke & Porter, 2012), the present study showed no differences in personal pronoun usage in high-stakes lies in comparison to high-stakes truths. In low stakes lies, less personal pronoun usage has been found in lies in the past as a means of dissociating oneself from the lie (DePaulo et al., 2003; Hancock et al., 2008; Newman et al., 2003). Contrary to past research however, personal pronouns were found to occur more in low-stakes lies than in low-stakes truths.

In the past, negative emotion words have also been found to be characteristic of deceptive speech. Words with negative affect have been theorized to reflect the mental state that liars exhibit, such as feeling guilty for being dishonest (Newman et al., 2003; Vrij, 2000). The present study did not find any significant differences in negative emotion words between truths and lies within a given session (e.g., low- or high-stakes session) or across sessions (e.g., low-stakes lies compared to high-stakes lies). However, high-stakes lies had more of an emotional tone (in general, not specifically negative) in comparison to low-stakes lies, but varied by the topic discussed. It is likely that some topics were more emotionally laden (e.g., convicted murderers should be executed) than others (e.g., global warming is a serious problem). Interestingly, there was more of an emotional tone in low-stakes lies than in low-stakes truth overall (where topic of

discussion would not have been an influence). Hence, there was a tendency for participants to be more emotional when telling lies in comparison to truths.

It was hypothesized that the linguistic features found to be indicative of deception in low-stakes situations would be more pronounced in high-stakes situations. However, personal pronouns and emotional words were actually used significantly more in low-stakes lies, but not in high-stakes lies. One possible explanation for these findings is the experience of cognitive dissonance. In a classic study by Festinger & Carlsmith (1959), participants engaged in monotonous tasks and rated how enjoyable they were and were paid either one or twenty dollars. Participants who were paid one dollar rated the tasks significantly more enjoyable in comparison to those who were paid twenty dollars. It was proposed that participants who were given the twenty dollars had a justifiable, external (financial) reason to engage in the boring tasks and, as a result, were more honest about their (lack of) enjoyment. In contrast, those who were paid one dollar experienced a larger discrepancy between their actions and attitudes, so they changed their opinion to match their behaviour by rating the tasks more enjoyable. The participants in the present study may have experienced a similar phenomenon. In the high-stakes scenario, participants had an external motivation (e.g., avoiding the punishment task) to lie, whereas, the low-stakes situation had no such motivation. Participants were told to lie about their beliefs on a social issue. By doing so, the participants may have experienced some cognitive dissonance and potentially started to internalize what they were saying. This internalization of their false opinion may explain why there was a higher usage of personal pronouns and a greater emotional tone in low-stakes lies; participants were starting to take ownership of their false opinion and become more passionate about what they were speaking to reduce the experience of cognitive dissonance.

4.3 Deception Ability and its Relation to the Dark Triad

In the vast majority of studies, deception detection rates are at chance level (Bond & DePaulo, 2006; Kraut, 1980; Vrij, 2000). When broken down to detecting lies in low- versus high-stakes scenarios, accuracy rates have been found to be higher in high-stake situations (Whelan et al., 2015). However, the confederate in the present study was able to detect deception at 76.1% and 70.4% accuracy levels in low-stakes and high-stakes contexts, respectively. Several possible explanations could explain why our confederate, an undergraduate student, was able to obtain accuracy levels of Secret Service agents (Ekman & O'Sullivan, 1991). First, some researchers have proposed the existence of deception detection 'wizards,' who consistently and accurately detect deception (O'Sullivan & Ekman, 2004). O'Sullivan & Ekman (2004) found a subset of individuals who performed well on different high-stakes lie detection tests that involve lies about opinions, lies about mock crimes, and lies about emotions. It is possible that the confederate in the current study is one of these 'wizards.' However, there is a debate in the literature about 'wizards'; other researchers have suggested that studies identifying 'wizards' have had methodological and statistical issues and that the validity of this group of lie detectors is still unclear (Bond & Uysal, 2007). A second, more likely, explanation for our confederate's impressive above-chance level accuracy rate includes the ability to better predicts a person's true opinion based on knowledge of general societal attitudes towards a particular social issue. For example, many young Canadians support the legalization of marijuana, most people believe global warming to be a serious issue, and a large number of students would not support universities raising their tuition (see Appendix A). As a result, our confederate may have had higher probabilities of being accurate when determining a participant's true opinion (at least for some of the social issues).

Individuals who possess characteristics of any of the three personality constructs of the Dark Triad have been associated with a number of antisocial tendencies related to deceit (Jonason, Li, Webster, & Schmitt, 2009; Lee & Ashton, 2005). Further, those with dark personalities perceive themselves to be better deceivers in comparison to other people (Giammarco et al., 2013). Some research supports the notion that certain Dark Triad individuals are more successful at deception. For example, Billings (2004) videotaped participants who made true and false statements and found those higher on psychopathy were significantly better at deceiving naïve judges than those rated lower. Further, it was suggested that the interpersonal/affective facet of psychopathy was more related to an enhanced ability to deceive than the antisocial/lifestyle facet. However, like most existing research (e.g., Wright et al., 2015), the present study suggests that those with dark personalities were no more successful than their non-dark counterparts at deception (though it is important to note that individual differences in deception success among the Dark Triad may have been masked due to the confederate's unusually high success rate).

Despite not being better at deception, some Dark Triad individuals appeared to vary in the amount of effort they put in their truths and lies. Specifically, Machiavellianism was significantly associated with trying hard to be convincing in low-stakes lies. This finding is in line with past research demonstrating that Machiavellians tend to use more cognitive effort while lying (Baughman, Jonason, Lyon, & Vernon, 2014). Additionally, those who score high on both psychopathy and Machiavellianism were significantly associated with trying *less* to be convincing in their high-stakes truth. If the high-stakes lie sounded more convincing to the confederate, then it would ultimately allow the participant to avoid the punishment. Trying to be less convincing in high-stakes truth could be viewed as a strategy to make their high-stakes lie

sound more convincing. Dark Triad individuals have been found to adopt “cheater strategies” particularly in the realm of dating (Jonason et al., 2009). The present study suggests that some of the personalities in the Dark Triad also employ calculated tactics in the use of deception in general.

It seems odd that those with a higher proclivity towards deception, such as the Dark Triad, would not be more successful. In a related line of research, Black, Woodworth, and Porter (2014) investigated how well dark personalities assessed features of vulnerability. These researchers found that Dark Triad individuals, known for their manipulative and exploitative behaviour, were not better able to assess vulnerability in comparison to their counterparts. It was suggested that dark personalities hold a “negative other” heuristic (where they perceive all others to be weak and potential victims) and, as a result, adopt a “quantity over quality” strategy to find their targets and exploit them. A similar trend may be observed when engaging in deception, such that dark personalities lie to anyone and/or everyone. Evidence shows that Dark Triad individuals do deceive more often (Azizli et al., 2016; Jonason et al., 2014), but are actually no better at deception when compared to their counterparts. Another potential explanation involves the *type* of lie. For example, McLeod and Generux’s (2008) research investigated a wide range of personality types and its influences on four different types of lies, including altruistic (to protect others), conflict avoidance, social acceptance (to fit in with or be liked by others), and self-gain (to materially benefit oneself) lies. For each type of lie, results suggested that a unique set of personality characteristics were able to significantly predict both the acceptability of lying and the likelihood of lying. Notably, Machiavellianism was a significant predictor for self-gain lies (McLeod & Generux, 2008). Dark personalities may only be better at deceiving others when the lies they are telling are self-serving.

4.4 Limitations

The current study had a number of limitations. Although the false opinion paradigm has been shown to reveal individual differences in deception by past researchers (e.g., Frank & Ekman, 1997), requiring participants to disclose their opinions on social, political, and economic issues gave rise to three potential problems in the present study. Participants could have been vulnerable to the effects of social desirability when completing the questionnaire on their opinions of sensitive topics. In addition, social desirability could have affected the participants' language use because they may not have felt comfortable providing the reasons for which they were for or against the opinion selected for their session. Additionally, some topics may have been more difficult to discuss because they required a general understanding of the current state of affairs. For example, if a participant had to verbalize whether they thought the decreasing value of oil in Canada was a good thing in the long run (see Appendix A), participants must have had, at minimum, a vague indication of the ways in which the oil industry has been beneficial and detrimental to Canada's economy, job market, and international standing. If participants lacked such knowledge, it could have affected the arguments they made to support their opinions, directly influencing the linguistic content. The effects of social desirability and a lack of knowledge may have been a potential explanation as to why we did not see many of the linguistic differences typically found between truths and lies in past research. Further, lying about opinions may be different experience in comparison to lying about other topics, such as an event one has experienced. Therefore, the linguistic findings of the present study may only be partially generalizable to other types of deception. Despite the mentioned potential limitations, some of the present study's findings were not influenced by the use of a false opinion paradigm, such as those that pertained to emotional experiences by Dark Triad individuals and people in

general. Additionally, one linguistic cue (i.e., word count) result was also not influenced by the social issue discussed within the false opinion paradigm. Therefore, the current study revealed noteworthy findings within the realm of deception.

The present study lacked some ecological validity due to the nature of the methodology. Participants came to a laboratory setting that was highly controlled. Participants gave their true and false opinions to a confederate who was instructed to not interact with the participants. The reasoning for this was to keep the effect of the confederate consistent across all participants. If the confederate engaged with the participants, there would have been more variability in her behaviour across participants that impacted their behaviour. Overall, the paradigm was regarded as a strength of the current study because it made it possible to explore the research question regarding how one person changes their discourse between lies of varying stakes. However, the drawback of the paradigm was that the lies did not resemble those typically told in everyday life. Usual conversations between two people involve each person taking turns speaking (Levinson, 2016). Crossley and colleagues (2016) found that those with Dark Triad traits performed better in negotiations in face-to-face interactions than in computer-mediated interactions. The researchers posited that dark personalities and their ability to charm, manipulate, intimidate, and exploit others are more effective with a live and engaged audience. It may be that people in general, and Dark Triad individuals in particular, may have deceived differently if they were able to adapt their communication strategy to the nonverbal or verbal feedback given by the confederate.

4.5 Future Directions

This area of research is valuable because understanding the linguistic similarities and differences between low-stakes and high-stakes deception could contribute to higher accuracy

rates in detecting deception. A positive correlation has been found between accuracy rates for detecting two different types of high-stakes lies (i.e., false opinion and mock crime).

Specifically, individuals who excelled at detecting one type of lie tended to excel in detecting the other kind of lie (Frank & Ekman, 1997). The results of this study suggest that people have a higher word count when giving high-stakes lies in direct comparison to low-stakes lies. This linguistic cue could be incorporated into training programs for deception detection. In one meta-analysis, training was found to improve participants' overall ability to detect deception (Hauch, Sporer, Michael, & Meissner, 2014). However, training with linguistic content cues had the largest effect on detection accuracy (when compared to training for nonverbal, paraverbal, or multi-channel cues and giving participants feedback), demonstrating the importance of conducting research that will enhance our understanding of effective linguistic cues for determining veracity (Hauch et al., 2014).

Although the present study revealed some interesting results, there is much more to be learned about how people, and individuals with Dark Triad traits, change their language across different lying situations. It would be worthwhile exploring similar research questions using the same methodological paradigm, but having participants lie about different topics. In everyday life, Depaulo and colleagues (1996) identified that people lie most frequently about their personal feelings, preferences, and attitudes and to protect themselves from disapproval. Additionally, Machiavellianism has been shown to be linked to viewing self-serving lies as acceptable and being more likely to engage in this type of lie (McLeod & Generux, 2008). Perhaps, we may see more striking linguistic differences when individuals speak about topics that are more personal. However, the difficulty with asking participants to draw from personal experiences to deceive is the ability to compare results across all other participants. Despite this

challenge, it still may be worthwhile to see whether language differences are observed when people speak about more topics that they have an intimate connection to.

In addition to exploring how linguistic characteristics change across situations of varying stakes with different types of lies, future research should also consider using participants who are more characteristic of the full spectrum of the Dark Triad. Scores on the Dark Triad measures in the present undergraduate sample were relatively low. As mentioned in the results section, MACH-IV scores were normally distributed, suggesting we had wide range of scores on the construct of Machiavellianism in our sample. However, SRP-III and NPI scores were positively skewed, indicating that we had more participants scoring lower on the psychopathy and narcissism construct. Perhaps, if there was a wider range of scores on these two dark personalities, we may have found more differences in the pattern of emotions (and in some of our other analyses) between those scoring in the high range on the Dark Triad and those who scored in the low range. Additionally, we may find linguistic characteristics indicative of the dark personality features found in past research, such as an increased use of personal pronouns among those higher in psychopathy (Hancock et al., 2013; Le et al., 2015). A study should be conducted with criminal offenders, who typically score higher on Dark Triad traits and may have more experience with and may be more skilled at using deception. Replications of this study with a non-university sample would increase the external validity of these findings.

Because the present study primarily focused on the verbal cues and how they changed from low- to high-stakes scenarios, research should also be done to understand the extent of change among the other channels of deception within a person. Other cues, such as nonverbal behaviour (e.g., body language, hand movements), paraverbal behaviour (e.g., tone, pitch of voice), and facial expressions have also been found to be useful in detecting deception (Porter &

ten Brinke, 2010). Identifying cues that may be more stable and those that may be more dynamic for people when they lie across different situations would provide incremental knowledge on how better to detect deception.

An extension of the present study would be to include additional confederates to observe participants. Having more observers would allow researchers to add at least two elements to the current study's methodology and results. First, the intensity of the participants' emotions would potentially be heightened because there are now more eyes and ears judging their lie; the stakes would be ramped up. Second, preliminary research has suggested that small groups (e.g. of three) of observers resulted in a modestly higher deception detection accuracy rate than that observed in an individual (Dilley, Rose, & Porter, unpublished). Understanding the effectiveness of groups in relation to detecting deceit may have important legal implications, such as for jury decision-making.

Understanding the manner in which humans alter their language in different deceptive contexts is key to understanding deception at a broader level. Deception is so embedded in everyday life and is an act that virtually almost everyone engages in. Some undetected lies by particular individuals (e.g. murderers and corporate leaders), can have significant consequences to the safety and wellbeing of the public. Despite being known for their callousness and propensity for lying, results revealed that Dark Triad individuals showed similar emotional patterns and were no more successful at deception than their non-dark counterparts. Further, the current study provided a unique look into how people speak in lies of varying stakes. Previous research had identified linguistic patterns in low- or high-stakes deception across different people, but this is the first study (to my knowledge) that attempted to identify the changes in verbal cues in lies of both low- and high- stakes within a person. The results suggest that the

amount of words people speak is one important language variable that shifts within a person across low- and high-stakes lies. Possessing a greater understanding of how people change or adapt their language in different types of lies is crucial to efforts of law enforcement agencies and others in detecting the lies that could result in harm to society.

References

- Aamodt, M. G., & Custer, H. (2006). Who can best catch a liar?: A meta-analysis of individual differences in detecting deception. *The Forensic Examiner, 15*(1), 6-11.
- Ackerman, R. A., Witt, E. A., Donnellan, M., Trzesniewski, K. H., Robins, R. W., & Kashy, D. A. (2011). What does the Narcissistic Personality Inventory really measure? *Assessment, 18*, 67-87.
doi:10.1177/10731911110382845
- Altshuler, I. M. (1925). The psychopathology of lying. *Journal of Neurology, Neurosurgery, and Psychiatry, 6*, 20-26. doi:10.1136/jnnp.s1-6.21.20
- Anderson, N. E., & Stanford, M. S. (2012). Demonstrating emotional processing differences in psychopathy using affective ERP modulation. *Psychophysiology, 49*, 792-806.
doi:10.1111/j.1469-8986.2012.01369.x
- Augustine. (1952). Lying (M. Muldowney, Trans.) In R. Deferrari (Ed.), *Treatises on various subjects* (pp. 53-120). New York, NY: Catholic University of America.
- Azizli, N., Atkinson, B. E., Baughman, H. M., Chin, K., Vernon, P. A., Harris, E., & Veselka, L. (2016). Lies and crimes: Dark Triad, misconduct, and high-stakes deception. *Personality and Individual Differences, 89*, 34-39. doi:10.1016/j.paid.2015.09.034
- Baughman, H. M., Jonason, P. K., Lyons, M., & Vernon, P. A. (2014). Liar liar pants on fire: Cheater strategies linked to the dark triad. *Personality and Individual Differences, 71*, 35-38.
doi:10.1016/j.paid.2014.07.019

- Billings, F. J. (2004). Psychopathy and the ability to deceive. ProQuest Information & Learning. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 65(3), 1589-1589.
- Bok, S. (1978). *Lying: Moral choice in public and private life*. New York: Vintage Books.
- Bond, C. F., Jr, & DePaulo, B. M. (2006). Accuracy of deception judgments. *Personality and Social Psychology Review*, 10(3), 214-234. doi:10.1207/s15327957pspr1003_2
- Bond, C.F., Jr., & Uysal, A. (2007). On lie detection “wizards”. *Law and Human Behavior*, 31, 109-115. doi:10.1007/s10979-006-9016-1
- Book, A., Methot, T., Gauthier, N., Hosker-Field, A., Forth, A., Quinsey, V., & Molnar, D. (2015). The mask of sanity revisited: Psychopathic traits and affective mimicry. *Evolutionary Psychological Science*, 1(2), 91-102. doi:10.1007/s40806-015-0012-x
- Book, A., Visser, B.A., & Volk, A.A. (2015). Unpacking ‘evil’: Claiming the core of the Dark Triad. *Personality and Individual Differences*, 73, 29-38. doi:10.1016/j.paid.2014.09.016
- Brook, M., & Kosson, D. S. (2012). Impaired cognitive empathy in criminal psychopathy: Evidence from a laboratory measure of empathic accuracy. *Journal of Abnormal Psychology*, 122, 156-166. doi:10.1037/a0030261
- Buller, D.B., Burgoon, J.K., Buslig, A., & Roiger, J. (1996). Testing interpersonal deception theory: The language of interpersonal deception. *Communication Theory*, 6, 268-269. doi:10.1111/j.1468-2885.1996.tb00129.x

- Buller D.B., Burgoon, J.K., White, C., & Ebesu, A. (1994). Interpersonal deception: VII. Behavioral profiles of falsification, equivocation and concealment. *Journal of Language and Social Psychology, 13*, 366-395. doi:10.1177/0261927X94134002
- Campbell, W., Brunell, A. B., & Finkel, E. J. (2006). Narcissism, interpersonal self-regulation, and romantic relationships: An agency model approach. In K. D. Vohs & E. J. Finkel (Eds.), *Self and relationships: Connecting intrapersonal and interpersonal processes* (pp. 57-83). New York, NY: Guilford Press.
- Campbell, W., Hoffman, B. J., Campbell, S. M., & Marchisio, G. (2011). Narcissism in organizational contexts. *Human Resource Management Review, 21*, 268-284. doi:10.1016/j.hrmr.2010.10.007
- Campbell, W., Reeder, G. D., Sedikides, C., & Elliot, A. J. (2000). Narcissism and comparative self-enhancement strategies. *Journal of Research in Personality, 34*, 329-347.
doi:10.1006/jrpe.2000.2282
- Caso, L., Gnisci, A., Vrij, A., & Mann, S. (2005). Processes underlying deception: An empirical analysis of truth and lies when manipulating the stakes. *Journal of Investigative Psychology and Offender Profiling, 2*(3), 195-202. doi:10.1002/jip.32
- Christie, R., & Geis, F. (1970). *Studies in Machiavellianism*. New York, NY: Academic Press.
- Corry, N., Merritt, R.D., Mrug, S., & Pamp, B. (2008). The factor structure of the narcissistic personality inventory. *Journal of Personality Assessment, 90*(6), 593-600.
doi:10.1080/00223890802388590

- Crossley, L., Woodworth, M., Black, P.J., & Hare, R. (2016). The dark side of negotiation: Examining the outcomes of face-to-face and computer-mediated negotiations among dark personalities. *Personality and Individual Differences, 91*, 47-51. doi:10.1016/j.paid.2015.11.052
- Davis, M., Markus, K.A., Walters, S.B., Vorus, N., & Connors, B. (2005). Behavioral cues to deception vs. topic incriminating potential in criminal confessions. *Law and Human Behavior, 29*, 683-704. doi:10.1007/s10979-005-7370-z
- Del Gaizo, A. L., & Falkenbach, D. M. (2008). Primary and secondary psychopathic-traits and their relationship to perception and experience of emotion. *Personality and Individual Differences, 45*, 206-212. doi:10.1016/j.paid.2008.03.019
- DePaulo, B. M., Undsay, J. J., Malone, B. E., Muhlenbruck, L., Charlton, K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin, 129*, 74-118. doi:10.1037/0033-2909.129.1.74
- DePaulo, B.M & Jordan, A. (1982). Age changes in deceiving and detecting deceit. In R.S. Feldman (Ed.), *Development of nonverbal behavior in children* (pp. 151-180). New York: Springer-Verlag.
- DePaulo, B. M., Kashy, D. A., Kirkendol, S. E., Wyer, M. M., & Epstein, J. A. (1996). Lying in everyday life. *Journal of Personality and Social Psychology, 70*(5), 979-995. doi:10.1037/0022-3514.70.5.979
- deVilliers, J.G., & deVilliers, P.A. (1978). *Language acquisition*. Cambridge, MA: Harvard University Press.
- Dilley, T., Rose, K., & Porter, S. (2016). Three's company: The performance of groups verses individuals in tasks of direct and indirect lie detection. Unpublished Manuscript.

- Dolan, M., & Fullam, R. (2006). Face affect recognition deficits in personality-disordered offenders: Association with psychopathy. *Psychological Medicine*, *36*, 1563–1569.
doi:10.1017/S0033291706008634
- Duran, N. D., Hall, C., McCarthy, P. M., & McNamara, D. S. (2010). The linguistic correlates of conversational deception: Comparing natural language processing technologies. *Applied Psycholinguistics*, *31*(3), 439-462. doi:10.1017/S0142716410000068
- Ekman, P. (1991). *Telling lies: Clues to deceit in the marketplace, politics, and marriage*. New York, NY: W. W. Norton.
- Ekman, P., & O'Sullivan, M. (1991). Who can catch a liar? *American Psychologist*, *46*(9), 913-920.
doi:10.1037/0003-066X.46.9.913
- Ekman, P., O'Sullivan, M., & Frank, M. G. (1999). A few can catch a liar. *Psychological Science*, *10*(3), 263-266. doi:10.1111/1467-9280.00147
- Fan, Y. Y., Wonneberger, C. C., Enzi, B. B., de Greek, M. M., Ulrich, C. C., Tempelmann, C. C., & ... Northoff, G. G. (2011). The narcissistic self and its psychological and neural correlates: An exploratory fMRI study. *Psychological Medicine*, *41*, 1641-1650.
doi:10.1017/S003329171000228X
- Festinger, L., & Carlsmith, J.M. (1959). Cognitive consequences of forced compliance. *The Journal of Abnormal and Social Psychology*, *58*(2), 203-210. doi:10.1037/h0041593
- Ford, C.V., (1996). *Lies! Lies! Lies!!! The psychology of deceit*. Washington, DC: American Psychiatric Press.

- Forth, A. E., Brown, S. L., Hart, S. D., & Hare, R. D. (1996). The assessment of psychopathy in male and female noncriminals: Reliability and validity. *Personality and Individual Differences, 20*, 531-543. doi:10.1016/0191-8869(95)00221-9
- Frank, M. G., & Ekman, P. (1997). The ability to detect deceit generalizes across different types of high-stake lies. *Journal of Personality and Social Psychology, 72*(6), 1429-1439. doi:10.1037/0022-3514.72.6.1429
- Frank, M. G., & Feeley, T. H. (2003). To catch a liar: Challenges for research in lie detection training. *Journal of Applied Communication Research, 31*, 58-75. doi:10.1080/00909880305377
- Fry, W.R. (1985). The effect of dyad Machiavellianism and visual access on integrative bargaining outcomes. *Personality and Social Psychology Bulletin, 11*, 51-62.
doi:10.1177/0146167285111005
- Geis, F. L., & Moon, T. H. (1981). Machiavellianism and deception. *Journal of Personality and Social Psychology, 41*(4), 766-775. doi:10.1037/0022-3514.41.4.766
- Giammarco, E. A., Atkinson, B., Baughman, H. M., Veselka, L., & Vernon, P. A. (2013). The relation between antisocial personality and the perceived ability to deceive. *Personality and Individual Differences, 54*(2), 246-250. doi:10.1016/j.paid.2012.09.004
- Hancock, J. T. (2007). Digital deception: The practice of lying in the digital age. *Digital Deception: The Practice of Lying in the Digital Age*, 109-120.
- Hancock, J. T., Curry, L. E., Gohra, S., & Woodworth, M. (2008). On lying and being lied to: A linguistic analysis of deception in computer-mediated communication. *Discourse Processes, 45*, 1-23. Retrieved from <http://ubc.summon.serialssolutions.com/search?s.q>

- Hancock, J., Woodworth, M. T., & Porter, S. (2011). Hungry like the wolf: A word pattern analysis of the language of psychopaths. *Legal and Criminological Psychology*. Advance online publication. doi: 10.1111/j.2044-8333.2011.02025.x.
- Hare, R. D. (2003). *The Hare Psychopathy Checklist - Revised*. Toronto, Canada: Multi-HealthSystems.
- Hare, R. D. (2006). Psychopathy: A clinical and forensic overview. *Psychiatric Clinics of North America*, 29, 709-724. doi:10.1016/j.psc.2006.04.007
- Hare, R. D., & Neumann, C. S. (2008). Psychopathy as a clinical and empirical construct. *Annual Review of Clinical Psychology*, 4, 217-246. doi:10.1146/annurev.clinpsy.3.022806.091452
- Harpster, T., Adams, S.H., & Jarvis, J.P. (2009). Analyzing 911 homicide calls for indicators of guilt or innocence. *Homicide Studies*, 13, 69-93. doi:10.1177/1088767908328073
- Hauch, V., Sporer, S.L., Michael, S.W., & Meissner, C.A. (2014). Does training improve the detection of deception? A meta-analysis. *Communication Research*, 1-61. doi:10.1177/0093650214534974
- Hubbell, A.P., Mitchell, M.M., & Gee, J.C. (2001). The relative effects of timing of suspicion and outcome involvement on biased message processing. *Communication Monographs*, 68, 115-132. doi:10.1080/03637750128056
- Jakobwitz, S., & Egan, V. (2006). The Dark Triad and normal personality traits. *Personality and Individual Differences*, 40, 331-339. doi:10.1016/j.paid.2005.07.006
- John, O.P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O.P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 102-138). New York: Guilford

- Jonason, P. K., Koenig, B. L., & Tost, J. (2010). Living a fast life: The Dark Triad and life history theory. *Human Nature, 21*, 428-442. doi:10.1007/s12110-010-9102-4
- Jonason, P. K., Lyons, M., Baughman, H. M., & Vernon, P. A. (2014). What a tangled web we weave: The dark triad traits and deception. *Personality and Individual Differences, 70*, 117-119. doi:10.1016/j.paid.2014.06.038
- Jonason, P. K., Li, N. P., Webster, G. D., & Schmitt, D. P. (2009). The Dark Triad: Facilitating a short-term mating strategy in men. *European Journal of Personality, 23*, 5-18. doi:10.1002/per.698
- Jonason, P. K., Slomski, S., & Partyka, J. (2012). The Dark Triad at work: How toxic employees get their way. *Personality and Individual Differences, 52*, 449-453. doi:10.1016/j.paid.2011.11.008
- Jones, S., & Miller, J. D. (2012). Psychopathic traits and externalizing behaviors: A comparison of self- and informant reports in the statistical prediction of externalizing behaviors. *Psychological Assessment, 24*, 255-260. doi:10.1037/a0025264
- Jones, D. N., & Paulhus, D. L. (2009). Machiavellianism. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 93-108). New York, NY: Guilford Press.
- Kessler, S. R., Bandelli, A. C., Spector, P. E., Borman, W. C., Nelson, C. E., & Penney, L. M. (2010). Re-examining Machiavelli: A three-dimensional model of Machiavellianism in the workplace. *Journal of Applied Social Psychology, 40*, 1868-1896. doi:10.1111/j.1559-1816.2010.00643.x
- Klaver, J. R., Lee, Z., & Hart, S. D. (2007). Psychopathy and nonverbal indicators of deception in offenders. *Law and Human Behavior, 31*(4), 337-351. doi:10.1007/s10979-006-9063-7

- Kraut, R. (1980). Humans as lie detectors: Some second thoughts. *Journal of Communication*, 30, 209-216.
- Lamba, S., & Nityananda, V. (2014). Self-deceived individuals are better at deceiving others. *PloS one*, 9(8), e104562. doi:10.1371/journal.pone.0104562
- Le, M.T., Woodworth, M., Gillman, L., Hutton, E., & Hare, R.D. (2016). *The linguistic output of psychopathic offenders during a PCL-R Interview*. Manuscript submitted for publication.
- Lee, K., & Ashton, M. C. (2005). Psychopathy, Machiavellianism, and narcissism in the Five-Factor Model and the HEXACO model of personality structure. *Personality and Individual Differences*, 38, 1571-1582. doi:10.1016/j.paid.2004.09.016
- Levine, T. R. (2014). Truth-default theory (TDT): A theory of human deception and deception detection. *Journal of Language and Social Psychology*, 33(4), 378-392. doi:10.1177/0261927X14535916
- Levinson, S.C. (2016). Turn-taking in human communication – origins and implications for language processing. *Trends in Cognitive Sciences*, 20, 6-14. doi:10.1016/j.tics.2015.10.010
- Livingstone Smith, D. (2004). *Why we lie: The evolutionary roots of deception and the unconscious mind*. New York: St Martin's Press.
- Machiavelli, N. (1961). *The prince*. London, England: Penguin.
- Mahmut, M. K., Menictas, C., Stevenson, R. J., & Homewood, J. (2011). Validating the factor structure of the Self-Report Psychopathy Scale in a community sample. *Psychological Assessment*, 23, 670-678. doi:10.1037/a0023090

- Malterer, M. B., Glass, S. J., & Newman, J. P. (2008). Psychopathy and trait emotional intelligence. *Personality and Individual Differences, 44*, 735-745. doi:10.1016/j.paid.2007.10.007
- Mann, S., Vrij, A., & Bull, R. (2002). Suspects, lies, and videotape: An analysis of authentic high-stake liars. *Law and Human Behavior, 26*(3), 365-376. doi:10.1023/A:1015332606792
- Masip, J., Garrido, E., & Herrero, C. (2004). Defining deception. *Anales de Psicología, 20*, 147-171.
- McLeod, B. A., & Genereux, R. L. (2008). Predicting the acceptability and likelihood of lying: The interaction of personality with type of lie. *Personality and Individual Differences, 45*(7), 591-596. doi:10.1016/j.paid.2008.06.015
- McQuaid, S. M., Woodworth, M., Hutton, E. L., Porter, S., & ten Brinke, L. (2015). Automated insights: Verbal cues to deception in real-life high-stakes lies. *Psychology, Crime & Law, 21*(7), 617-631. doi:10.1080/1068316X.2015.1008477
- Menon, M., & Sharland, A. (2011). Narcissism, exploitative attitudes, and academic dishonesty: An exploratory investigation of reality versus myth. *Journal of Education for Business, 86*, 50-55. doi:10.1080/08832321003774772
- Miller, J.D., Gaughan, E.T., Pryor, L.T., Kamen, C., & Campbell, W.K. (2009). Is research using the narcissistic personality inventory relevant for understanding narcissistic personality disorder? *Journal of Research in Personality, 43*, 482-488. doi:10.1016/j.jrp.2009.02.001
- Miller, J. D., Jones, S. E., & Lynam, D. R. (2011). Psychopathic traits from the perspective of self- and informant reports: Is there evidence for a lack of insight? *Journal of Abnormal Psychology, 120*, 758-764. doi:10.1037/a0022477

- Mudrack, P.E., & Mason, E.S. (1995). Extending the Machiavellianism construct: A brief measure and some unexplored relationships. *Journal of Social Behavior and Personality*, 10(1), 187-200.
- Newman, M. L., Pennebaker, J. W., Berry, D. S., & Richards, J. M. (2003). Lying words: Predicting deception from linguistic styles. *Personality and Social Psychology Bulletin*, 29(5), 665-675.
doi:10.1177/0146167203029005010
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory (3rd ed.)*. New York, NY: McGraw-Hill.
- O'Sullivan, M., & Ekman, P. (2004). The wizards of deception detection. In P.A. Granhag & L. A. Stromwall (Eds.), *Deception detection in forensic contexts* (pp. 269-286). Cambridge, UK: Cambridge Press.
- Oberlander, J., & Gill, A. J. (2006). Language with character: A stratified corpus comparison of individual differences in e-mail communication. *Discourse Processes*, 42, 239-270.
doi:10.1207/s15326950dp4203_1
- Panitz, E. (1989). Psychometric investigation of the MACH-IV scale measuring Machiavellianism. *Psychological Reports*, 64(3), 963-968. doi:10.2466/pr0.1989.64.3.963
- Paulhus, D.L. (1998). Interpersonal and intrapsychic adaptiveness of trait self-enhancement: A mixed blessing? *Journal of Personality and Social Psychology*, 74, 1197-1208. doi:10.1037/0022-3514.74.5.1197
- Paulhus, D. L., Neumann, C., & Hare, R. D. (2015). *Manual for the Self-Report Psychopathy Scale (4th ed.)*. Toronto, ON CAN: Canada: Multi-Health Systems.

- Paulhus, D. L., & Williams, K. M. (2002). The Dark Triad of personality: Narcissism, Machiavellianism and psychopathy. *Journal of Research in Personality, 36*, 556-563. doi:10.1016/S0092-6566(02)00505-6
- Pennebaker, J. W. (2011). *The secret life of pronouns: What our words say about us*. New York: Bloomsbury Press.
- Pennebaker, J. W., Boyd, R. L., Jordan, K., & Blackburn, K. (2015). The Development and Psychometric Properties of LIWC2015. *The University of Texas at Austin*.
- Pennebaker, J. W., & Graybeal, A. (2001). Patterns of natural language use: Disclosure, personality, and social integration. *Current Directions in Psychological Science, 10*, 90-93. doi:10.1111/1467-8721.00123
- Picardi, A., Toni, A., & Caroppo, E. (2005). Stability of alexithymia and its relationships with the 'Big Five' factors, temperament, character, and attachment style. *Psychotherapy and Psychosomatics, 74*, 371-378. doi:10.1159/000087785
- Porter, S., & ten Brinke, L. (2010). The truth about lies: What works in detecting high-stakes deception? *Legal and Criminological Psychology, 15*(1), 57-75. doi:10.1348/135532509X433151
- Porter, S., Doucette, N.L., Woodworth, M., Earle, J., & MacNeil, B. (2008). Half the world knows not how the other half lies: Investigation of verbal and non-verbal signs of deception exhibited by criminal offenders and non-offenders. *Legal and Criminological, 13*, 27-38. doi:10.1348/135532507X186653
- Porter, S., Woodworth, M., & Black, P. (2016). Psychopathy and aggression. In C. Patrick (Ed.), *Handbook of psychopathy, Revised 2nd Edition*. New York: Guildford.

- Ramanaiah, N. V., Byravan, A., & Detwiler, F. J. (1994). Revised NEO Personality Inventory profiles of Machiavellian and non-Machiavellian people. *Psychological Reports, 75*, 937-938. Retrieved from <http://www.amsciepub.com/doi/abs/10.2466/pr0.1994.75.2.937>
- Raskin, R. N., & Hall, C. S. (1979). A narcissistic personality inventory. *Psychological Reports, 45*, 590. doi:10.2466/pr0.1979.45.2.590
- Raskin, R., & Terry, H. (1988). A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology, 54*, 890-902. doi:10.1037/0022-3514.54.5.890
- Rauthmann, J.F. (2013). Investigating the MACH-IV with item response theory and proposed the trimmed MACH*. *Journal of Personality Assessment, 95*(4), 388-397.
<http://dx.doi.org/10.1080/00223891.2012.742905>
- Rogstad, J. E., & Rogers, R. (2008). Gender differences in contributions of emotion to psychopathy and antisocial personality disorder. *Clinical Psychology Review, 28*, 1472-1484.
doi:10.1016/j.cpr.2008.09.004
- Ryan, J.J. (1984). Validity of the narcissistic personality inventory in a psychiatric sample. *Journal of Clinical Psychology, 40*(1), 140-142. doi:10.1002/1097-4679(198401)40:1<140::AID-JCLP2270400127>3.0.CO;2-E
- Seibert, L., Miller, J. D., Few, L. R., Zeichner, A., & Lynam, D. R. (2011). An examination of the structure of self-report psychopathy measures and their relations with general traits and externalizing behaviors. *Personality Disorders: Theory, Research, and Treatment, 2*, 193-208.
doi:10.1037/a0019232

- Siegman, A.W., & Boyle, S. (1993). Voices of fear and anxiety and sadness and depression: The effects of speech rate and loudness of fear and anxiety and sadness and depression. *Journal of Abnormal Psychology, 102*(3), 430-437. doi:10.1037/0021-843X.102.3.430
- Serota, K. B., & Levine, T. R. (2015). A few prolific liars: Variation in the prevalence of lying. *Journal of Language and Social Psychology, 34*(2), 138-157. doi:10.1177/0261927X14528804
- Shaw, J., Porter, S., & ten Brinke, L. (2013). Catching liars: Training mental health and legal professionals to detect high-stakes lies. *Journal of Forensic Psychiatry & Psychology, 24*(2), 145-159. doi:10.1080/14789949.2012.752025
- Spidel, A., Hervé, H., Greaves, C., & Yuille, J. C. (2011). 'Wasn't me!' A field study of the relationship between deceptive motivations and psychopathic traits in young offenders. *Legal and Criminological Psychology, 16*(2), 335-347. doi:10.1348/135532510X518722
- Stouthamer-Loeber, M. (1986). Lying as a problem behavior in children: A review. *Clinical Psychology Review, 6*, 267-289. doi:10.1016/0272-7358(86)90002-4
- Sutton, J., Smith, P. K., & Swettenham, J. (1999). Bullying and 'theory of mind': A critique of the 'social skills deficit' view of anti-social behaviour. *Social Development, 8*, 117-127. doi:10.1111/1467-9507.00083
- Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology, 29*, 24-54. doi:10.1177/0261927X09351676

- ten Brinke, L., McDonald, S., Porter, S., & O'Connor, B. (2012). Crocodile tears: Facial, verbal and body language behaviour associated with genuine and fabricated remorse. *Law and Human Behaviour, 36*, 51-59. doi:10.1037/h0093950
- ten Brinke, L., & Porter, S. (2012). Cry me a river: Identifying the behavioral consequences of extremely high-stakes interpersonal deception. *Law and Human Behavior, 36*, 469-477. doi:10.1037/h0093929
- Van Swol, L. M., & Braun, M. T. (2014). Communicating deception: Differences in language use, justifications, and questions for lies, omissions, and truths. *Group Decision and Negotiation, 23*(6), 1343-1367. doi:10.1007/s10726-013-9373-3
- Vonk, J., Zeigler-Hill, V., Mayhew, P., & Mercer, S. (2013). Mirror, mirror on the wall, which form of narcissist knows self and others best of all? *Personality and Individual Differences, 54*, 396-401. doi:10.1016/j.paid.2012.10.010
- Vrij, A. (2000). *Detecting lies and deceit: The psychology of lying and the implications for professional practice*. New York: Wiley.
- Vrij, A., & Mann, S. (2001). Telling and detecting lies in a high-stake situation: The case of a convicted murderer. *Applied Cognitive Psychology, 15*, 187-203. doi:10.1002/1099-0720(200103/04)15:2<187::AID-ACP696>3.3.CO;2-1
- Vrij, A., Mann, S., Fisher, R., Leal, S., Milne, B., & Bull, R. (2008). Increasing cognitive load to facilitate lie detection: The benefit of recalling an event in reverse order. *Law and Human Behavior, 32*, 253-265. doi:10.1007/s10979-007-9103-y

- Wai, M., & Tiliopoulos, N. (2012). The affective and cognitive empathic nature of the Dark Triad of personality. *Personality and Individual Differences, 52*, 794-799. doi:10.1016/j.paid.2012.01.008
- Walczyk, J. J., Harris, L. L., Duck, T. K., & Mulay, D. (2014). A social-cognitive framework for understanding serious lies: Activation-decision-construction-action theory. *New Ideas in Psychology, 34*, 22-36. doi:10.1016/j.newideapsych.2014.03.001
- Wastell, C., & Booth, A. (2003). Machiavellianism: An alexithymic perspective. *Journal of Social and Clinical Psychology, 22*, 730-744. doi:10.1521/jsep.22.6.730.22931
- Watson, D., Clark, L.A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS Scales. *Journal of Personality and Social Psychology, 47*, 1063-1070. <http://dx.doi.org/10.1037/0022-3514.54.6.1063>
- Watson, P. J., & Morris, R. J. (1991). Narcissism, empathy and social desirability. *Personality and Individual Differences, 12*, 575-579. doi:10.1016/0191-8869(91)90253-8
- Williams, K. M., & Paulhus, D. L. (2004). Factor structure of the Self-Report Psychopathy scale (SRP-II) in non-forensic samples. *Personality and Individual Differences, 37*, 765-778. doi:10.1016/j.paid.2003.11.004
- Williams, K. M., Paulhus, D. L., & Hare, R. D. (2007). Capturing the four-factor structure of psychopathy in college students via self-report. *Journal of Personality Assessment, 88*, 205-219. doi:10.1080/00223890701268074
- Wright, G. R. T., Berry, C. J., Catmur, C., & Bird, G. (2015). Good liars are neither 'Dark' nor self-deceptive. *Plos One, 10*(6). doi:10.1371/journal.pone.0127315

- Whelan, C.W., Wagstaff, G. F., & Wheatcroft, J. M. (2015). Subjective cues to deception/honesty in a high stakes situation: An exploratory approach. *The Journal of Psychology: Interdisciplinary and Applied*, 149(5), 517-534. doi:10.1080/00223980.2014.911140
- Zhou, L., Burgoon, J. K., Zhang, D., & Nunamaker, J. F. (2004). Language dominance in interpersonal deception in computer-mediated communication. *Computers in Human Behavior*, 20(3), 381-402. doi:10.1016/S0747-5632(03)00051-7
- Zuckerman, M., DePaulo, B.M., & Rosenthal, R. (1981). Verbal and nonverbal communication of deception. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 14, pp. 1-59). New York: NY: Academic Press.

Appendices

Appendix A

Opinions on Social Issues Questionnaire

This scale consists of a number of statements on a variety of social issues. Please indicate the extent to which you agree or disagree with the statement using the scale provided. Remember, there are no right or wrong answers. We are interested in your opinions on these social issues. You will be asked to provide your opinion verbally to two of these social issues in your upcoming sessions.

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

_____ “Convicted murderers should be executed”

_____ “Universities should be allowed to raise tuition to enable further growth”

_____ “Global warming is a serious problem”

_____ “Marijuana should be legalized”

_____ “People on welfare are just taking advantage of the system”

_____ “Medical testing on animals is acceptable”

_____ “Human cloning should be permitted”

_____ “Concerns over terrorism justify racial profiling”

_____ “The decreasing value of oil is a good thing for Canada in the long run”

_____ “The threshold for successful immigration applications and refugee applications should be made more lenient”

Appendix B

Questions Completed by the Confederate

Opinion #1:

[Circle One] This participant was telling the [TRUTH]/[LIE]

Rate the following statements using this scale:

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

- _____ I am confident in my decision
- _____ This participant was persuasive
- _____ This participant was dominant
- _____ This participant was engaging
- _____ This participant seemed nervous

Opinion #2:

[Circle One] This participant was telling the [TRUTH]/[LIE]

- _____ I am confident in my decision
- _____ This participant was persuasive
- _____ This participant was dominant
- _____ This participant was engaging
- _____ This participant seemed nervous

- _____ I thought this participant was physically attractive

Appendix C

Questions Completed by the Participant

Please rate each statement on the following scale:

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

_____ I tried my best to be as convincing as I could when telling the **truth**

_____ I tried my best to be as convincing as I could when telling the **lie**

_____ Saving time and receiving an extra 0.5 credit was a desirable reward

_____ I wanted to avoid doing the punishment task

_____ I thought the person observing was physically attractive

Appendix D

Means, Standard Deviations, and Ranges of Emotions at the Beginning of the Study Session

	Low-Stakes		High-Stakes	
	Mean (SD)	Range	Mean (SD)	Range
Active	2.34 (1.04)	1.00-5.00	2.24 (.99)	1.00-5.00
Afraid	1.45 (.84)	1.00-5.00	1.34 (.77)	1.00-5.00
Alert	2.90 (.97)	1.00-5.00	2.94 (1.07)	1.00-5.00
Ashamed	1.20 (.52)	1.00-3.00	1.13 (.51)	1.00-4.00
Attentive	2.93 (.90)	1.00-4.00	3.08 (.95)	1.00-5.00
Determined	2.62 (.90)	1.00-4.00	2.63 (1.00)	1.00-4.00
Distressed	1.83 (.96)	1.00-5.00	1.80 (.87)	1.00-4.00
Enthusiastic	2.55 (1.08)	1.00-5.00	2.49 (1.05)	1.00-5.00
Excited	2.48 (1.08)	1.00-5.00	2.34 (.97)	1.00-4.00
Guilty	1.20 (.55)	1.00-4.00	1.15 (.55)	1.00-4.00
Hostile	1.24 (.64)	1.00-4.00	1.24 (.62)	1.00-4.00
Inspired	2.14 (1.03)	1.00-5.00	2.15 (1.03)	1.00-5.00
Interested	3.23 (.99)	1.00-5.00	3.11 (1.01)	1.00-5.00
Irritable	1.55 (.79)	1.00-4.00	1.61 (.87)	1.00-5.00
Jittery	2.08 (.98)	1.00-5.00	2.06 (.86)	1.00-4.00
Nervous	2.30 (1.05)	1.00-5.00	2.39 (1.02)	1.00-5.00
Proud	2.11 (1.08)	1.00-5.00	2.13 (1.00)	1.00-5.00
Scared	1.65 (.99)	1.00-5.00	1.48 (.88)	1.00-4.00
Strong	2.41 (1.05)	1.00-5.00	2.34 (.88)	1.00-4.00
Upset	1.44 (.81)	1.00-4.00	1.25 (.53)	1.00-3.00

**Means, Standard Deviations, and Ranges of Emotions
at the End of the Study Session**

	Low-Stakes		High-Stakes	
	Mean (SD)	Range	Mean (SD)	Range
Active	2.49 (1.07)	1.00-5.00	2.36 (1.11)	1.00-5.00
Afraid	1.44 (.95)	1.00-5.00	1.73 (1.13)	1.00-5.00
Alert	2.94 (1.05)	1.00-5.00	3.04 (1.09)	1.00-5.00
Ashamed	1.31 (.75)	1.00-5.00	1.51 (.89)	1.00-5.00
Attentive	3.06 (1.04)	1.00-5.00	3.03 (1.04)	1.00-5.00
Determined	2.42 (1.12)	1.00-5.00	2.49 (1.00)	1.00-4.00
Distressed	2.00 (.93)	1.00-5.00	2.25 (1.09)	1.00-5.00
Enthusiastic	2.42 (1.15)	1.00-5.00	2.37 (1.11)	1.00-5.00
Excited	2.52 (1.16)	1.00-5.00	2.58 (1.12)	1.00-5.00
Guilty	1.46 (.84)	1.00-5.00	1.66 (1.00)	1.00-5.00
Hostile	1.20 (.55)	1.00-3.00	1.23 (.66)	1.00-4.00
Inspired	2.00 (1.12)	1.00-5.00	2.06 (1.07)	1.00-5.00
Interested	3.20 (1.09)	1.00-5.00	3.45 (1.07)	1.00-5.00
Irritable	1.46 (.77)	1.00-4.00	1.49 (.73)	1.00-4.00
Jittery	2.52 (1.21)	1.00-5.00	2.63 (1.20)	1.00-5.00
Nervous	2.46 (1.21)	1.00-5.00	2.87 (1.31)	1.00-5.00
Proud	2.01 (.96)	1.00-5.00	1.99 (.93)	1.00-4.00
Scared	1.45 (.95)	1.00-5.00	1.76 (1.09)	1.00-5.00
Strong	2.34 (1.11)	1.00-5.00	2.11 (.93)	1.00-5.00
Upset	1.42 (.82)	1.00-5.00	1.41 (.69)	1.00-4.00

Appendix E

Correlations Between Confederate Perceptions and the Dark Triad in Low-Stakes Session

	SRP-III		NPI		MACH-IV	
	Lies	Truths	Lies	Truths	Lies	Truths
Confidence	-.12	-.11	-.11	-.12	-.02	-.01
Persuasiveness	.09	-.01	.04	-.10	.03	-.02
Dominance	.10	.10	.03	-.01	.08	.01
Engagement	.15	.12	-.01	-.01	.22	.14
Nervousness	.02	-.01	.02	.08	.04	.05

SRP-III = Self-Report Psychopathy Scale, NPI = Narcissistic Personality Inventory, MACH-IV = Machiavellian Scale. All r values $p > .05$.

Correlations Between Confederate Perceptions and the Dark Triad in High-Stakes Session

	SRP-III		NPI		MACH-IV	
	Lies	Truths	Lies	Truths	Lies	Truths
Confidence	-.13	-.13	-.21	-.21	-.04	-.04
Persuasiveness	.02	-.07	.05	-.07	.05	.05
Dominance	.15	.06	.09	.03	.14	.14
Engagement	-.04	-.03	-.06	-.08	.04	.09
Nervousness	-.12	-.04	-.18	-.20	-.06	-.07

SRP-III = Self-Report Psychopathy Scale, NPI = Narcissistic Personality Inventory, MACH-IV = Machiavellian Scale. All r values $p > .05$.