

I love the way you lie: Investigating the relationship between psychopathic tendencies and
lying behaviour

by

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Abstract

Lying is considered a common behaviour that individuals engage in on a daily basis. Prior research indicated that the presence of certain personality traits, such as psychopathy, impacts the inclination to lie. I examined subclinical psychopathy, plus other variables, in predicting self-reported lying frequency, level of enjoyment received from lying, and motivations for lying in different contexts, in a sample of undergraduate ($n = 91$) and community ($n = 61$) participants. I hypothesized that individuals with subclinical psychopathy will have a greater tendency to lie across situations and enjoy it. Subclinical psychopathy was the only consistent predictor for all lying behaviour measures across samples. However, psychopathy did not predict lying behaviour across all contexts in which one could engage in deception. These findings enhance our understanding that specific features of psychopathy exist in subclinical, non-forensic populations, and they can predict behaviours such as lying.

Keywords: psychopathy, lying behaviour

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I love the way you lie: Investigating the relationship between psychopathic tendencies and lying behaviour

Lying is an intrinsic part of human behaviour. In this thesis, I investigated whether personality characteristics predict lying, focusing specifically on lying in different contexts. I begin by describing psychopathy, a personality construct often associated with lying. Next, I review lying behaviour, including frequency of lying and motivations for lying, followed by discussing the relationship between lying and psychopathy. I then describe the present study, where I investigated the following questions: Does psychopathy predict how lying is used in different contexts? Is lying and its relation to psychopathy similar in student and community samples?

Psychopathy

Blair, Mitchell, and Blair (2005) describe psychopathy as a multifaceted personality disorder that has emotional, interpersonal, and behavioural components. Before delving into the intricate aspects of psychopaths' ability to engage in lying and deceptive behaviours, I first need to describe how psychopathy is measured. The most widely used assessment tool to measure psychopathy in forensic settings is the Psychopathy Checklist-Revised (PCL-R) and its variants (Hare, 1991). The PCL-R is comprised of a 20-item scale that measures traits thought to characterize psychopathy based on two underlying factors. Factor 1 represents the affective and interpersonal traits, such as lack of empathy, shallow affect, the tendency to lie pathologically and manipulate others, and a grandiose sense of self-worth. Factor 2 represents items associated with antisocial behaviour such as impulsivity and poor behavioural controls (Hare, 1991).

Genetic and environmental factors play a role in the development of psychopathy, although their roles are not yet fully understood (Thompson, Ramos, & Willett, 2014). Vien

and Beech (2006) describe a neurobiological theory of psychopathy that highlights the role of dysfunctions in the amygdala and various cortical regions that impair emotional processing. Studies have found that the lack of responsiveness to distress-based or negative emotional cues, such as fearful and sad facial expressions, results from a dysfunction in the amygdala and other neural structures. Vien and Beech note that Kiehl et al. (2001) found criminal psychopaths given an affective word memory task exhibited attenuated activity in the amygdala compared to criminals without psychopathy and non-criminal controls. In addition, they note that dysfunction in the amygdala is also linked to psychopaths' tendencies to engage in instrumental aggression¹ but there is a debate about whether aggression-oriented behaviours, instrumental or reactive aggression, result from dysfunctions in the amygdala or from the orbitofrontal cortex (OFC).

Viding and McCrory (2012) examined callous-unemotional traits in children using both twin and brain imaging (MRI) studies. They found that children who have callous-unemotional traits are susceptible to developing full-blown psychopathy in adulthood. These traits are typically exclusive to psychopathy and they are aligned with items included in Factor 1 of the PCL-R. This suggests that these traits in boys have a genetic and neurocognitive basis. However, Viding and McCrory do not disregard the salient role environmental influences play in the development of psychopathy and antisocial behaviour. More specifically, environmental influences can accelerate, delay, or attenuate the development of callous-emotional traits found in children.

Although psychopathy has received extensive attention in clinical and forensic settings, exploring psychopathic traits in subclinical settings has received less attention. Previous research indicates that individuals in the general population have varying degrees of

¹ Instrumental aggression is a goal-directed behaviour that is planned. It is typically contrasted with reactive aggression that is unplanned and which occurs in response to an event.

psychopathic tendencies. LeBreton, Binning, and Adorno (2006) note that subclinical psychopaths are akin to clinical psychopaths with respect to types of behaviours, cognitions and interpersonal relationships, but they differ in terms of intensity. For instance, individuals with subclinical psychopathy engage in less severe forms of antisocial behaviour compared to their clinical counterparts. Paulhus and colleagues have investigated the role of psychopathy in behaviours such as cheating on exams (Williams, Nathanson, & Paulhus, 2010) as part of his work on the Dark Triad (Machiavellianism, narcissism, and psychopathy; Paulhus, 2014).

Lying behaviour

A key component of the present project is examining psychopathy as a predictor for lying behaviour. Deception is a multidimensional concept that involves producing a known false statement to another individual with the intention that the other person believes it to be true (Primoratz, 1984). Lying can be considered using several dimensions, including its motivations, its frequency of occurrence, and the contexts in which lying occurs.

Frequency of lying. Lying is a fairly common behaviour that occurs on a daily basis. Accordingly, DePaulo et al. (1996) examined lying frequency in everyday life with community and undergraduate populations. Participants were asked to fill out social interaction and deception forms every day for a week. They were instructed to report lies told during social interactions that lasted for at least ten minutes. They also completed self-report questionnaires about perceived lying frequency and whether their lies were successful. DePaulo et al. found that lying does in fact occur every day. On average, participants from the community sample reported one lie a day and participants from the undergraduate sample reported two lies a day. Furthermore, although they hypothesized that women would lie less frequently than men, they found that gender did not play a role in frequency of lying across both samples. DePaulo et al. argued that participants likely neglected to report a majority of their lies. DePaulo et al. note that gaps in memory and awareness of lies could have impacted

the number of lies reported. In addition, participants could have overstressed the trivial nature of their lies, such as altruistic lies or lies told for impression management. In defence of the validity of DePaulo et al.'s findings, however, they found that participants were not reluctant to report lies for self-gain.

More recently, Serota, Lebine, and Boster (2010) conducted a nationwide study on the prevalence of lying in the United States. The study used an online self-report questionnaire that included specific questions about lying frequency. The findings of the study were similar to DePaulo et al.'s (1996). On average, participants reported that they told one to two lies a day. However, Serota et al. found that men report more lies than women. Moreover, the frequency and the inclination to lie varied based on the target of the deceptive act. Participants were more likely to deceive people they were familiar with than strangers. Interestingly, Serota et al. found that the inclination to lie lessens with age. Determining whether responses reported are truthful is a major limitation of the study, a limitation shared with previous work, such as DePaulo et al. Another limitation is the use of a homogenous sample, as the majority of the sample was comprised of Caucasian participants, constraining the generalizability of the results to individuals from other ethnic backgrounds, an issue acknowledged by Serota et al.

Dike, Baranoski, and Griffin (2005) reviewed studies on the frequency of pathological lying and its impact in forensic and clinical contexts. Pathological lying is lying frequently and impulsively to others. It is an extreme form of lying and its presence demands caution, particularly in legal contexts. Pathological liars are classified as either primary or secondary pathological liars. Primary pathological liars are individuals who do not exhibit symptoms associated with a psychiatric disorder, whereas secondary pathological liars are individuals who engage in pathological lying as a symptom associated with a psychiatric disorder.

Although lying is a common behaviour in community populations, Dike et al. (2005)

note that individuals with specific personality traits or disorders are more likely to engage in secondary pathological lying than others. Thus, individuals with antisocial personality disorder (ASPD), bipolar personality disorder (BPD), factitious disorder, and Ganser syndrome lie more than others. Dike et al. also suggested that researchers direct their attention to whether pathological lying is uncontrollable and whether pathological liars are fit to stand trial.

McLeod and Genereux (2008) investigated whether specific personality traits are strong predictors for the acceptability of lying and inclination to lie in general. Their study involved a series of self-report questionnaires that measured undergraduate participants' personality traits and attitudes towards acceptability and likelihood of lying, focusing on six personality traits to evaluate the association between personality traits and lying frequency: honesty, kindness, assertiveness, approval motivation, self-monitoring, and Machiavellianism. They used four types of lies to evaluate acceptability and likelihood of lying: altruistic lies, conflict avoidance lies, social acceptance lies, and self-gain lies. McLeod and Genereux found that specific personality traits did predict the acceptability and likelihood of lying; however, these findings were contingent on the type of lie being assessed (Phillips, Meek, & Vendemia, 2011). For example, they found that personality traits such as Machiavellianism and assertiveness impact individuals' tendencies to lie on a consistent basis. The results associated with Machiavellianism, a personality trait characterized by manipulation with an emphasis on self-interest and deception, is interesting because it is one of the Dark Triad personality traits that include narcissism and psychopathy (Paulhus, 2014). McLeod and Genereux propose that future research include a wider variety of personality characteristics and types of lies, and to consider the specific role of personality characteristics in evaluating deception, as opposed to generally exploring one's attitudes towards acceptability and likelihood of lying.

Motivations for deception. The act of engaging in lying behaviour is typically inspired or encouraged by underlying desires or emotions. In other words, strong personal motivations may result in the process of carrying out the deceptive act. Research regarding individual motives for lying in forensic settings is limited. Thus, Petitclerc and Hervé (1999) developed eleven motivations for deception that were deemed relevant to forensic populations: compulsive lies told for no particular reason, secretive lies, lies to avoid punishment, lies to obtain rewards, lies to avoid negative evaluations, protective lies, lies to heighten self-presentations, altruistic lies, lies of carelessness, and lies for personal enjoyment. The goal of this research was to determine whether specific personality disorders impact the tendency to use certain motivations for lying more than others. Spidel (2002) illustrates this approach. She evaluated file information and videotaped interviews of 103 male offenders to examine the relationship between deceptive motivations and personality disorders. Spidel found that adult male offenders with high levels of psychopathy, measured by the PCL-R, were more inclined to lie for personal enjoyment, to avoid punishment, to gain a reward, and to heighten self-presentation than non-psychopathic offenders. Psychopathic offenders also lied more frequently than their non-psychopathic counterparts. Both psychopaths and narcissists lied for personal enjoyment, possibly because they both possess a desire to exercise power over others. In addition, Spidel found that histrionic offenders had greater tendencies to lie to obtain a reward than non-histrionic offenders, consistent with the tendency to engage in persistent manipulative behaviour for attention that is characteristic of individuals with histrionic personality disorder. Lastly, Spidel found that participants with borderline personality disorder (BPD) lied compulsively compared to non-borderline offenders. Spidel suggests that this may be related to the traits that characterize BPD, such as frequently engaging in impulsive behaviour. Overall, Spidel showed that specific deceptive motivations, with the exception of lying compulsively, overlap across the personality

disorders she assessed. Her results also suggest that specific motivations are exclusive to specific personality disorders. Spidel noted several limitations in her study. First, the model used to code individuals' deceptive motivations was unable to differentiate lies told to obtain a reward from compulsive lies when assessing offenders with BPD. Second, classifying personality disorders based on file information only should be supplemented by semi-structured interviews as a means to provide a more accurate diagnosis for personality disorders. Finally, Spidell argued that future research should include female offenders as well as use a larger sample to increase external validity.

Consistent with Spidel's (2002) findings, Spidel, Hervé, Greaves, and Yuille (2011) found that juvenile offenders with high levels of psychopathy, measured by the Psychopathy Checklist: Youth Version (PCL:YV), were more inclined to lie for personal enjoyment, to gain a reward, and to heighten self-presentation, compared to juvenile offenders with medium and low levels of psychopathy. Spidel et al. used the eleven motivations for lying developed by Petitclerc and Hervé (1999) to investigate whether forensically relevant motives for deceptive behaviour are applicable to individuals with varying levels of psychopathy. Participants with grandiose and manipulative characteristics use them to their advantage in forensic settings. In contrast to Spidel's (2002) findings, avoiding punishment was not one of the motivations for deception found in juvenile offenders. The difference in age, level of psychopathy, and length of sentence may partially account for the lack of motivation to deceive in order to avoid punishment in juvenile offenders. Spidel et al.'s sample size was small, consisting of 45 males and 15 females, thereby limiting generalizations to women and the target population as a whole. A larger sample size would provide improved statistical properties and a better gender and ethnic distribution, which in turn would increase external validity. A positive feature of Spidel's study was that the data were retrieved solely from

previous research interviews, providing a more abundant source of information than available from file information.

Work in non-forensic settings has been valuable in understanding the social motivations of deception. Ford (1996) provides a rich understanding of the contextual aspects of lies. He classified lies into several categories, describes their social purpose and the situations in which one would likely deceive in a given category. For example, individuals can engage in white lies, defensive lies, aggressive lies, humorous lies, or pathological lies. Moreover, Ford remarks that these different types of lies are accommodated by motivations. For instance, lies told to heighten others' sense of self-worth can be perceived as an altruistic lie. Similarly, Ekman (1997) examined various motives for lying through interviews with children and questionnaires completed by adults to derive nine motives for lying: to avoid punishment, to receive a reward, to protect others from punishment, to protect oneself from physical distress, to gain respect of others, to avoid uncomfortable social situations, to prevent humiliation, to prevent disclosing private information, and to display authority. These motives for engaging in lying behaviour are more relevant in community settings and everyday situations, as opposed to the individual motives for lying in forensic and clinical settings previously discussed.

Hample (1980) conducted exploratory studies with undergraduate populations to investigate the purposes and effects of lying. Two of three studies asked the same group of participants to think of a lie they told and to describe it. The first study was in the form of an in-class questionnaire and the second study assessed participants' responses through interviews. The findings from the first study suggested that individuals are more inclined to lie to their superiors than their peers. The results also showed that personal benefits and maintaining interpersonal relationships were participants' primary motivations for lying. Consistent with the results from the questionnaire study, personal gain was the initial

response when participants were asked about their motivations for deception in the interview study. However, participants in the second study did not appear concerned about maintaining interpersonal relationships as a motive for lying. Hample's results were limited by a small sample size for both studies, potentially affecting generalization. Participants in both studies showed signs of discomfort and reluctance when asked about personal lies told to others that may have had an impact on the results. To address these concerns, Hample added a third study aimed at attenuating participants' apprehension at being evaluated by asking a larger sample about other persons' lies as opposed to their own. Results from the third study were consistent with the previous studies in that the majority of lies told were for personal benefit. Hample argued that although asking about the lies of others may still be perceived as biased, it successfully reduced respondents' anxiety about self-disclosure which typically accompanies admissions of behaviour that challenges societal expectations to avoid lying.

Psychopathy and lying behaviour

Research examining the relationship between psychopathic tendencies and deception has yielded inconsistent results. Porter and Woodworth (2007) assessed differences between psychopaths' and non-psychopaths' official and self-reported homicide descriptions. They rated offenders' official and self-reports of the homicide offense on a scale ranging from purely instrumental to purely reactive. Porter and Woodworth found that individuals with high levels of psychopathic characteristics measured by the PCL:R had a greater tendency to exaggerate the impulsive and reactive nature of the crime compared to individuals with low levels of psychopathy. In other words, psychopaths were more likely to report the homicide as a purely reactive act versus a goal-oriented act, a finding that was related to Factor 1 traits of psychopathy. Moreover, psychopaths refrained from describing crucial details of the offense during the free narrative portion of the study. Porter and Woodworth remark that omitting major details of a homicide offense is indicative of deception. Similar to prior

studies on psychopathy in forensic contexts, Porter and Woodworth's sample size, 50 male inmates, was relatively small, possibly limiting external validity. Porter and Woodworth also note that amplifying the reactive nature of the offenses across the sample could have been a more accurate representation of the events than what was presented in offenders' official reports. However, Porter and Woodworth disregard the latter possibility, suggesting that exaggerated reactivity observed across the sample is more likely to be explained by memory dissimilarities in psychopaths and non-psychopaths. Finally, Porter and Woodworth proposed that future research should use the individual item scores to look at the role interpersonal (Factor 1) and behavioural (Factor 2) traits play in self-report misrepresentations.

Wright, Berry, Catmur, and Bird (2015) examined the relationship between Dark Triad personality traits (Machiavellianism, Narcissism, or Psychopathy) and the ability to generate lies and detect lies told by others in subclinical contexts. The study involved separating participants into groups of five. Each participant was asked to produce a lie or tell the truth to the rest of the group, while the other participants were asked to detect whether the statement was true or false. Wright et al. found no significant relationship between Dark Triad personality characteristics and the ability to generate or detect lies. However, lie acceptability and the ability to generate successful lies was observed in the Machiavellian sample. Despite a total sample size of 75 male and female adults, Wright et al. consider their "moderate" sample size as a limitation. Based on power calculations, they note that a larger sample size of 191 participants is required when exploring the relationship between Dark Triad characteristics, deceptive ability, and deception detection.

Williams, Nathanson, and Paulhus (2010) conducted three studies with undergraduate populations to investigate the association between Dark Triad personality traits and academic cheating. They found that all Dark Triad personality traits were associated with cheating behaviour to some extent. However, psychopathy was the strongest and narcissism was the

weakest predictor of cheating in academic settings. Williams et al. evaluated participants' personality traits and cheating behaviour using self-report questionnaires for the first and third study. The second study involved assessing the behavioural component of cheating via software called Turn-It-In, in addition to self-report personality questionnaires. The software identified participants' degree of plagiarism after submitting an essay for their psychology class. Williams et al. found that psychopathy was the central and most consistent predictor of cheating behaviour in all three studies. Williams et al. noted several limitations of their work. They suggest that the sample size was relatively small in the second study as a result of attempting to rectify issues associated with self-report questionnaires in the first study. This limitation evidently resulted in reduced external validity in the second study due to the restrictive nature of the recruitment process. In addition to the small sample size in the second study, the behavioural component (i.e. Turn-It-In) evaluated participants' level of plagiarism based solely on two essays, whereas the first study explored participants' previous cheating behaviour from high school, covering wider varieties of cheating. In addition, low levels of plagiarism were observed because students were only required to submit essays based on personal experiences, as opposed to standard literature reviews. Williams et al. proposed that future research should examine behavioural indicators of cheating behaviour or behaviours involving other types of misconduct, while taking time and sample size into account.

Rose and Wilson (2014) examined whether psychopathic and narcissistic personality traits are correlated with deceptive behaviour and how individuals perceive deception in undergraduate and community populations. They evaluated individuals' ratings on a variety of lies based on how often they engage in lying behaviour and whether they are permissible and justifiable. Rose and Wilson classified lies into two categories, white and black lies. White lies were considered more permissible, justifiable, and told more frequently, whereas

black lies were considered less permissible, less justifiable, and told less frequently. The findings indicate that individuals with higher levels of subclinical psychopathy and narcissism have a greater tendency to use both black and white lies compared to individuals with low levels of subclinical psychopathy and narcissism.

Dobrow (2016) found that individuals who engage in lying behaviour scored high on specific psychopathic personality traits measured by the Elemental Psychopathy Assessment (EPA): Antagonism, Emotional Stability, Disinhibition, and Narcissism. Undergraduate students' lying behaviour and personality traits were measured using a variety of self-report questionnaires, including the EPA. Dobrow hypothesized that increased levels of all the features of psychopathy would have an impact on lying behaviour. However, he found that only heightened levels of Antagonism and Disinhibition were associated with an increase in lying frequency and severity of lies told to others. Interestingly, the findings also indicate that individuals with increased levels of Antagonism and Disinhibition were more inclined to lie for personal enjoyment as measured by the Duping Delight scale, a scale developed by Dobrow for this study. These results may partially account for the general lack of empathy psychopaths demonstrate when engaging in behaviour that conflicts with societal norms. Moreover, Dobrow's findings associated with disinhibition could explain psychopaths' ability to engage in deceptive behaviour that is perceived as less permissible and justifiable. Dobrow addressed several limitations associated with his study. Self-presentation bias or self-serving bias may increase the likelihood that participants answer untruthfully to enhance self-presentation. Another limitation is that the EPA, a novel measure used to evaluate psychopathy, has not been validated to assess subclinical psychopathy. Finally, the use of an undergraduate sample may restrict the ability to generalize results to other populations. Replicating Dobrow's study in a clinical or forensic population could be beneficial for investigating whether these findings differ in individuals that possess heightened levels of

psychopathy, as well as assisting in the development of measures to evaluate deceptive and manipulative behaviour in criminals who meet the criteria for psychopathy using the PCL-R (Hare, 1991).

Lee, Klaver, and Hart (2008) investigated the relationship between psychopathic and non-psychopathic offenders' verbal indicators of deception. Offenders were asked to provide a description of their offense and an additional narrative about a crime involving theft, after being presented with a crime reenactment video clip. The description of the offense was measured as the "true condition" and the narrative about a theft represented the "false condition". Lee et al. used the PCL-R to measure psychopathy and the Statement Validity Assessment (SVA) to evaluate offenders' credibility in their honest and fabricated narratives. They found that psychopathic offenders generated more spontaneous corrections when lying compared to non-psychopathic offenders. According to the SVA, the use of spontaneous corrections is indicative of deception. They also found that psychopathic offenders provided more relevant detail than non-psychopathic offenders in the false condition. The use of appropriate detail was not observed in the true condition. Moreover, the findings suggest that psychopathic offenders were significantly less likely to be deemed as credible when providing honest narratives than their non-psychopathic counterparts. One limitation of Lee et al. was their homogeneous sample: 82 percent of the sample were Caucasian males. This homogeneity decreases the external validity of the study, making it difficult to generalize psychopaths' deceptive behaviour to women and other ethnic groups with psychopathy. The study also had a small sample size, consisting of 45 adult males. Lee et al. addressed the need for future research to replicate the study with a larger sample size which may help to determine whether more verbal indicators arise that distinguish true and false narratives between psychopathic and non-psychopathic offenders. Moreover, they suggest further

research to investigate the impact situational factors have on psychopaths' ability to deceive others.

Klaver, Lee, and Hart (2007) explored the association between psychopathy and deception by evaluating nonverbal indicators of deception in psychopathic and non-psychopathic offenders. Participants completed self-report questionnaires that evaluated lying behaviour such as lying frequency, perceived lying ability, and emotional responses as a result of lying. The study involved true and false conditions, similar to Lee et al. (2008). However, Klaver et al. also asked participants to provide confidence ratings before and after producing the false narrative portion of the study, to rate how easy it was to produce the false narrative, and to indicate whether others would believe it to be true. Nonverbal indicators were recorded and assessed using a coding system that focused on specific behaviours including blinks, smiles, pauses in speech, and the like. Klaver et al. found that psychopathic offenders rated their lying ability higher than non-psychopathic offenders, a finding only observed for psychopaths with high scores on the interpersonal facet of psychopathy. Moreover, findings from the affective responses questionnaire suggest that psychopathic offenders felt less anxious when lying than their counterparts. However, excitement was not reported as an affective response when lying, which is inconsistent with Ekman's (1997) research indicating that psychopaths lie for duping delight. Unexpected results from the self-reported lying frequency questionnaire show that psychopathy was not associated with increased lying frequency. In general, Klaver et al.'s findings on psychopathy and lying behaviour are consistent with previous research indicating a strong relationship between individuals with psychopathy and tendency to deceive others, although these results solely correspond to the interpersonal facet of psychopathy that includes pathological lying and grandiosity.

Consistent with the findings presented by Lee et al. (2008), Klaver et al. (2007) found that psychopathic offenders spoke for a longer period of time compared to non-psychopathic offenders. However, this finding was only detected in the true condition and not the false condition as in Lee et al.'s research. Moreover, the nonverbal indicators observed when psychopathic offenders were instructed to lie included excessive blinking, speaking faster, and an increase in head movements. These findings were not observed when examining nonverbal signs of deception in non-psychopathic offenders. Similar to the results associated with self-reported lying behaviour, psychopathic offenders' nonverbal indicators of deception were exclusively attributed to the interpersonal facet of psychopathy. Furthermore, Klaver et al. note some discrepancies in findings associated with psychopathy and indicators of deception in offender and non-offender samples. However, in a more recent study, Porter et al. (2008) found that speaking faster was the sole indicator of deception that distinguished offenders from non-offenders. The limitations in Klaver et al.'s research are akin to Lee et al.'s with respect to research design. Suggestions for future research were to further explore the relationship between psychopaths' body movements and deception, which would be useful in correctional settings, as it may disclose whether the movements are used to distract others. In addition, Klaver et al. propose that future research should examine the impact factors of psychopathy have on indicators of deception, as opposed to assessing the individual facets of psychopathy.

Research with undergraduate and community samples suggests that telling the truth requires less mental effort than lying. Verschuere (2016) examined psychopathic traits using the Youth Psychopathic Traits Inventory (YPI) and their relationship with cognitive costs and compulsive lying in violent offenders. Similar to prior studies on deception, participants in Verschuere's study were instructed to either lie, tell the truth, or choose to lie or tell the truth, using the Modified Sheffield Lie Test. Initially, participants were reimbursed a set monetary

value; however, compensation for their participation varied as it was contingent on their performance in the test. Verschuere found that participants were more inclined to tell the truth when given the option to either lie or tell the truth. Furthermore, instructing participants to lie led to significantly more errors and an increase in response time. Overall, the findings suggest that there is no significant relationship between psychopathy and lower cognitive costs of lying. Nonetheless, Verschuere's results are consistent with the findings of previous studies that lying typically involves a greater cognitive cost than telling the truth. Several factors could have impacted the results of Verschuere's study. The most prominent limitation was that the sample is not representative of women and ethnic minorities with psychopathy in forensic contexts. Verschuere also noted that participants may have avoided the choice to lie due to the risk of reduced compensation. Finally, there were more opportunities for truth telling than lying in the study, causing Verschuere to propose that future research should include equal opportunities for lying and truth telling.

Current study

Previous research conducted on the association between psychopathy and deception has exhibited relatively consistent results. The majority of prior studies indicate that higher levels of psychopathy are associated with higher levels of lying behaviour (Porter & Woodworth, 2007; Williams et al., 2010; Rose & Wilson, 2014; Dobrow, 2016; Lee et al., 2008; Klaver et al., 2007), with only a few studies suggesting that there is no relationship between psychopathy and lying behavior (Wright et al., 2015; Verschuere, 2016). The goal of the present study was to explore whether the presence of psychopathic personality traits affects the inclination to lie, and the emotional reaction to lying as a function of subclinical psychopathy. I also want to determine whether the inclination to lie is situational or not. Prior studies have used confidence ratings as a means of assessing psychopaths' perceived lying ability. However, I will use accuracy and confidence ratings on a general knowledge

task to determine whether grandiosity, an interpersonal trait in psychopathy (Hare, 1991), influences individuals' inclination to lie.

Moreover, previous research has shown a relationship between individuals with psychopathy and lying in clinical and forensic settings (Cogburn, 1993). Research has also found that individuals in the general population have varying degrees of psychopathic tendencies. Consequently, the present study will determine whether certain features of subclinical psychopathy (i.e., tendencies to lie) are present in undergraduate and community populations as well as forensic or clinical populations. Therefore, I hypothesized that individuals with subclinical psychopathy will have a greater tendency to lie across situations and enjoy it, as compared to individuals without subclinical psychopathy. In addition, I expected that individuals with subclinical psychopathy would have higher confidence ratings for their performance on the general knowledge test compared to individuals with low levels of subclinical psychopathy. Finally, I used a large sample of participants, including individuals from a community sample.

Method

Participants

The sample consisted of 152 participants that included Carleton University undergraduate students (n =91) and individuals from the general population (n =61). The sample was comprised of male (n = 45) and female (n =107) participants, who spoke English fluently and were between 18 and 65 years of age or more. Approximately 65% of the participation pool consisted of Caucasian individuals, while roughly 35% were comprised of non-Caucasian individuals. Carleton University undergraduate students, enrolled in CGSC 1001- Mysteries of the Mind, were recruited through SONA, a student participation pool that lists research projects seeking participants. The undergraduate sample received 0.5% course

credit as compensation for their participation. Participants from the community sample were recruited through Facebook, a widely used social media platform. The community sample did not receive any compensation for their participation, as their participation was completely voluntary.

Measures

Demographic Questionnaire. Participants were asked to provide personal demographic information about gender, age, marital status, language proficiency, education, ethnicity, and employment status. The demographic questionnaire is located in Appendix A.

Self-Reported Deception Scale. Created by Dobrow (2016), the self-report deception scale is a questionnaire designed to measure the frequency of lying. The questionnaire is comprised of six items and measured on a four-point Likert scale with responses ranging from never (1) to frequently (4). Five questions ask participants about the frequency of lies told to specific individuals, such as friends or family members, boss or professors, romantic partners, strangers, and law enforcement. One question pertains to the frequency of lies told for personal enjoyment. This question serves as a transition to the subsequent scale that assess participants' level of enjoyment from lying. This scale was internally consistent, with a Cronbach's Alpha value of .767. The Self-Reported Deception Scale is located in Appendix B.

Duping Delight Scale. Created by Dobrow (2016), the Duping Delight scale is a questionnaire developed to measure the level of enjoyment an individual receives from lying in various situations. The questionnaire is comprised of ten items and measured on a four-point Likert scale with responses ranging from never (1) to frequently (4). This scale was internally consistent with a Cronbach's Alpha value of .904. The duping delight scale is located in Appendix C.

Situational Lying Scale. Previous research has not explored the various contexts in which individuals with psychopathy use deception (Dobrow, 2016). Thus, the situational lying scale was created for the present study to assess whether lying is situational or not. This brief questionnaire is comprised of nine items and measured on a five-point Likert scale with response options ranging from very unlikely (1) to very likely (5). This scale consists of brief scenarios in which deception is used in nine situations. Participants were asked to rate the likelihood in which they would engage in the situations surrounding lies. The situational lying scale is located in Appendix D.

General Knowledge Task. The general knowledge task consisted of 25 general information questions of varying difficulty selected from Nelson and Narens (1980). The answers to the questions consist of exactly one word; thus, participants were asked to print their best guess in the space provided. After each question, participants were asked to provide their confidence rating for their answer on a 5-point Likert scale, with response options ranging from “not confident at all” (1) to “very confident” (5). This task was used in the present study to assess participants’ perception of their performance in comparison to their actual performance (objective performance). It provided an objective measure of a behaviour analogous to lying, that can be compared to the subjective measures of lying behaviour that the other questionnaires evaluate. The general knowledge task is located in Appendix E.

Modified Self-Report Psychopathy Scale. Created by Paulhus, Hemphill, and Hare (in press), the Modified Self-Report Psychopathy Scale (SRP-III) is a questionnaire developed to measure the degree to which psychopathic traits are present in non-forensic participants. This 29-item scale asks participants to rate the extent to which a statement relates to them on a 5-point Likert scale with response options ranging from “disagree strongly” (1) to “agree strongly” (5). This scale was found to be internally consistent with a

Cronbach's Alpha value of .84 (Gordts et al., 2017). The modified SRP-III is located in Appendix F.

Procedure

All participants were required to accept the conditions of an informed consent prior to the commencement of the study (Appendix G and H). The informed consent included an overview of the study, the intent of what the present study aims to understand, and information pertaining to risks and confidentiality. Participants were informed that they had the right to end their participation from the study at any time, for any reason, and without penalty. Once the participants accepted the conditions, they were able to begin the study.

Undergraduate student participants were recruited through Carleton University and other participants were recruited through social media platforms. Both groups clicked on a link which directed them to the study site. The study was administered online using Qualtrics survey software. Once participants accepted the conditions of the study, they answered questions about age, gender, and other demographic information. Participants were then asked to evaluate their lying behaviour using several questionnaires in the following order: 1) the Self-Reported Deception Scale, 2) the Duping Delight Scale, 3) the Situational Lying Scale. Next, participants were asked to complete the general knowledge task by answering general information questions and providing a confidence rating for each question on a five-point Likert scale. Participants were given thirty seconds to answer each general information question. Last, participants were asked to complete the Modified Self-Report Psychopathy Scale, after which participants were directed to the debriefing form (Appendix I). The time required for each participant to complete the study was approximately 30 minutes.

Results

Data were analyzed using R version 3.3.2 (R Core Team, 2017). All variables were calculated by summing individual responses for each item in a scale to create a total score for each scale. For each variable, I examined skewness and kurtosis and made boxplots to determine if outliers were present. Table 1 shows descriptive statistics for psychopathy scores. For the community sample, the distribution of the psychopathy scores is approximately symmetric and relatively flat with light tails, as indicated by the negative kurtosis. For the student sample, the distribution is moderately positively skewed and peaked with light tails, as indicated by the negative kurtosis. Thus, the two samples are not normally distributed, although based on the skew and kurtosis parameters presented below, the lack of normality appears to be more severe for participants in the student sample compared to the community sample. Further, as the data in Table 1 highlight, the mean psychopathy scores were comparable for the two populations. This pattern was not unexpected because psychopathy scores from non-forensic samples typically have a positive skew due to the clustering of scores at the low end of the scale, with only a small number of high scores.

Table 1
Descriptive statistics for total psychopathy scores between participant samples (out of 145)

Sample	Psychopathy				
	<i>M</i>	<i>SD</i>	Skew	Kurtosis	<i>SE</i>
Community	54.33	13.27	.33	-.55	1.70
Students	54.26	18.82	.72	-.36	1.97

As Figure 1 shows, outliers were detected when observing total SRP and factor scores among the student sample. Through visual inspection of the boxplot, there are only two outliers that are present, which consists of higher total SRP and Factor 2 scores. Further inspection of participants' SRP facet scores between samples, as shown in Figure 2, indicates that the outliers for the student sample are observed in the antisocial facet, which constitutes

Factor 2 of psychopathy. However, the outliers detected in the community sample were observed in the antisocial facet as well as the interpersonal facet, which constitutes Factor 1 of psychopathy.

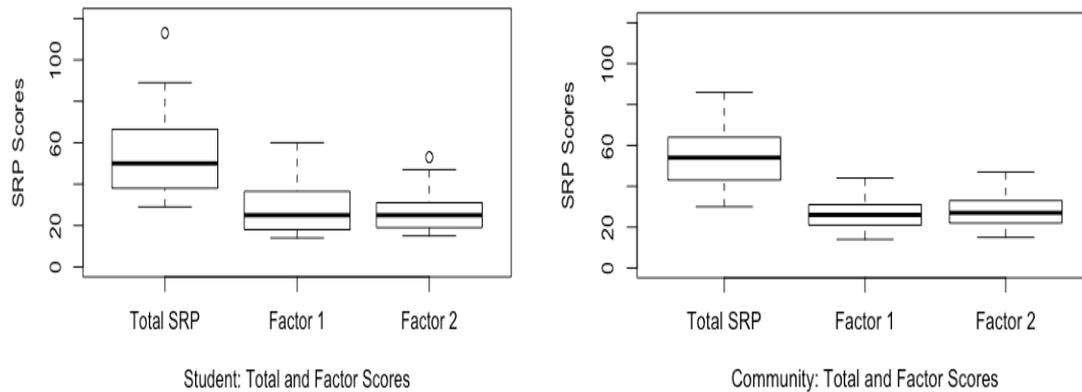


Figure 1. Boxplots showing total SRP and factor scores for student (left) and community (right) samples (R-flagged outliers indicated with a “o”).

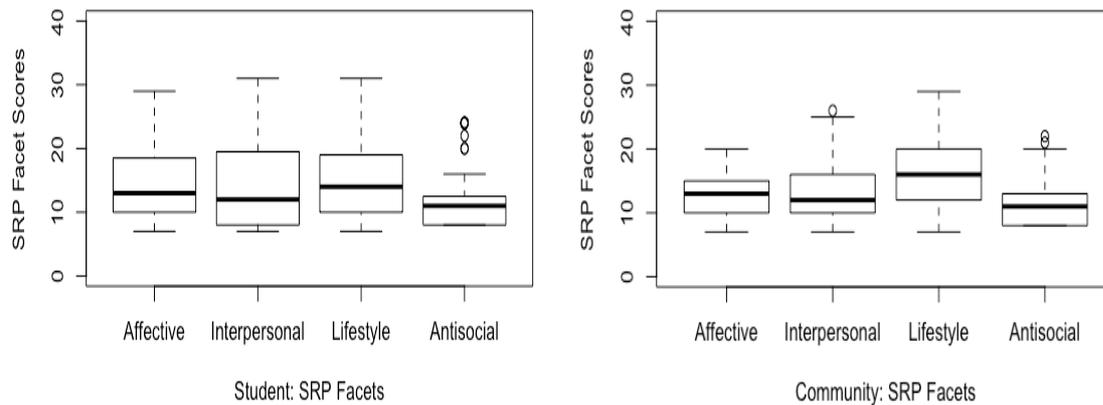


Figure 2. Boxplots showing SRP facet scores for student (left) and community (right) samples (R-flagged outliers indicated with a “o”).

Table 2 shows the descriptive statistics for self-reported lying frequency and duping delight scores. The distribution of lying frequency scores for the community population is highly positively skewed and peaked with heavy tails, as indicated by the positive kurtosis;

the distribution of the student population is moderately positively skewed and peaked with heavy tails, as indicated by the positive kurtosis. The distribution of participants' duping delight scores for the community sample is highly positively skewed and peaked with heavy tails; the distribution of the student sample is moderately positively skewed and peaked with light tails. Mean lying frequency scores and level of enjoyment as a result of lying (duping delight) are similar for both samples.

Table 2

Descriptive statistics for self-reported lying frequency scores (out of 24) and participants' level of duping delight (out of 40) as a function of sample type

Sample	Lying Frequency					Duping Delight				
	<i>M</i>	<i>SD</i>	Skew	Kurtosis	<i>SE</i>	<i>M</i>	<i>SD</i>	Skew	Kurtosis	<i>SE</i>
Community	11.16	2.89	1.38	3.49	.37	15.18	4.18	1.13	.39	.54
Students	11.23	3.29	.92	1.72	.34	16.97	5.81	.87	.60	.61

As shown in Figure 3, outliers were detected for self-reported lying frequency and duping delight scores in both samples.



Figure 3. Boxplots showing total lying frequency and duping delight scores for student (left) and community (right) samples (R flagged outliers indicated with a “o”)

Table 3 shows the descriptive statistics for contextual lying behaviour. For the community sample, the distribution skew is negligible, though the negative kurtosis indicates a moderately flat distribution with light tails. For the student sample, the distribution of participants’ situational lying scores is approximately symmetric and moderately flat with light tails, though the kurtosis is negligible. Mean contextual lying behaviour scores were similar for both samples.

Table 3

Descriptive statistics for participants’ situational lying scores in each sample (out of 45)

Sample	Situational Lying				
	<i>M</i>	<i>SD</i>	Skew	Kurtosis	<i>SE</i>
Community	19.25	4.17	-.1	-.57	.53
Students	21.24	6.63	.27	-.12	.69

As Figure 4 shows, minimal outliers were detected in the student population and several outliers were detected in the community population.

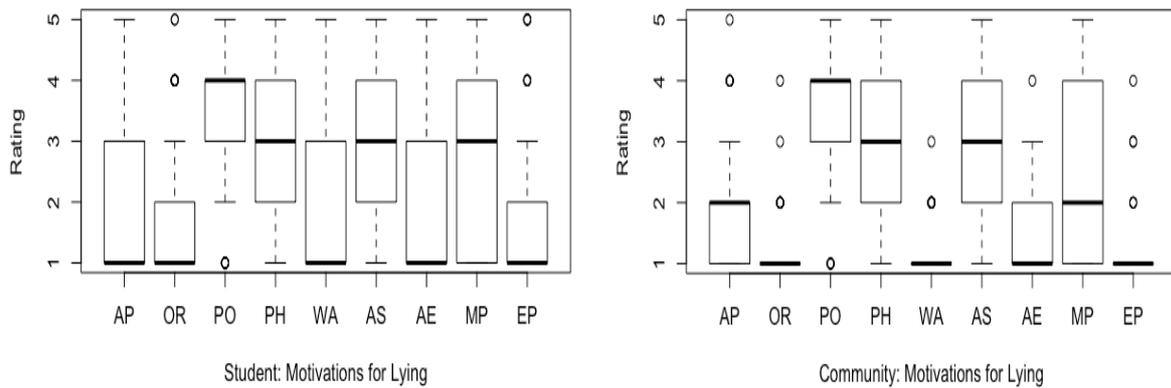


Figure 4. Boxplots showing student (left) and community (right) participants' situational lying ratings for each lying motive² (R flagged outliers indicated with a "o").

Table 4 shows descriptive statistics for the general knowledge task and corresponding confidence ratings. The skewness of general knowledge scores for both populations is negligible and moderately flat with light tails, as displayed by the negative kurtosis. Mean general knowledge scores are similar for the two samples. The distribution of participants' confidence ratings of their general knowledge in the community population is approximately symmetric and peaked with light tails, as indicated by the negative kurtosis. Skew in the student sample is negligible and moderately flat with light tails, though the kurtosis is negligible. Although participants' mean confidence ratings were comparable, the community sample reported slightly higher confidence compared to the student sample.

² AP = lying to avoid punishment

OR = lying to obtain a reward

PO = lying to protect others

PH = lying to protect oneself from physical harm

WA = lying to win admiration of others

AS = lying to avoid awkward situations

AE = lying to avoid embarrassment

MP = lying to maintain privacy

EP = lying to exercise power over others

Table 4

Descriptive statistics for participants' general knowledge scores (out of 25) and corresponding confidence ratings (out of 125) among sample type

Sample	General Knowledge					Confidence Rating				
	<i>M</i>	<i>SD</i>	Skew	Kurtosis	<i>SE</i>	<i>M</i>	<i>SD</i>	Skew	Kurtosis	<i>SE</i>
Community	13.92	4.85	-.13	-.65	.62	81.85	18.34	-.26	-.27	2.35
Students	12.54	5.39	-.14	-.76	.57	75.73	19.79	-.09	-.19	2.07

Figure 5 shows general knowledge test accuracy and Figure 6 shows general knowledge test confidence ratings. Outliers were detected when observing community participants' confidence on general knowledge questions of minimal difficulty. Although outliers were detected and were not removed in the data set, their impact may be substantial due to the small sample size in each population, which in turn, could potentially affect the overall findings of the present study.

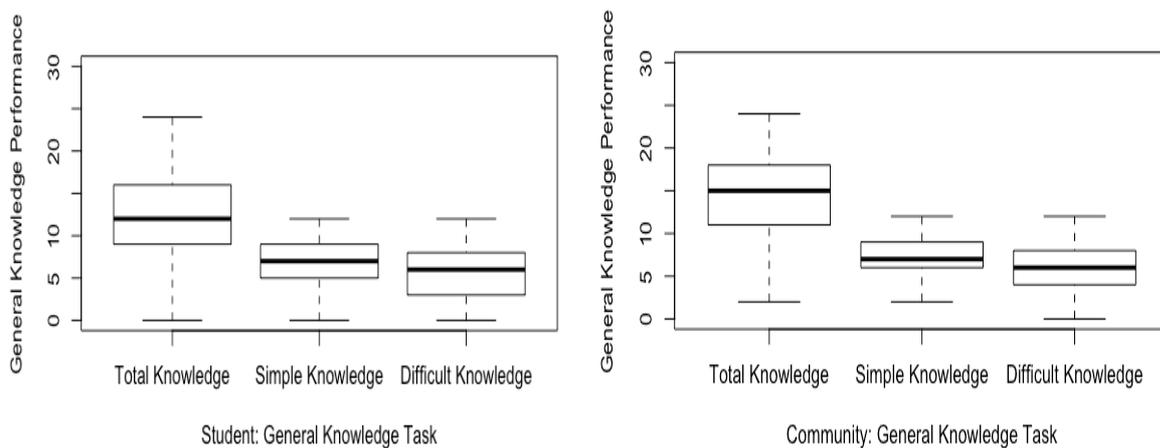


Figure 5. Boxplots showing participants' general knowledge performance categorized by difficulty, for student (left) and community (right) samples.

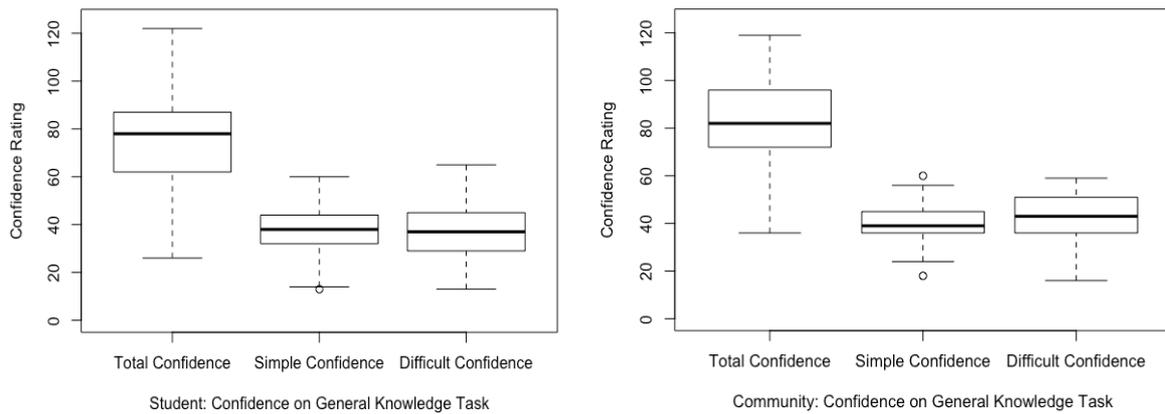


Figure 6. Boxplots showing student (left) and community (right) participants' confidence ratings of their general knowledge, categorized by difficulty (R-flagged outliers indicated with a "o").

Figure 7 shows frequency distributions for all variables (see diagonal plots), as well as scatterplots between all pairwise combinations of the variables in the present study, with linear regression lines fitted to the data in each scatterplot. Although many pairs of variables show no relationship, several show a moderate to strong relationship that is of theoretical interest. SRP (psychopathy) scores show a moderate positive relation with several of the lying measures, including total duping, total lying, and total situational lying, $r(150) = .52$, $p < .001$; $r(150) = .37$, $p < .001$; and $r(150) = .36$, $p < .001$, respectively. However, SRP scores were not related to either of the knowledge measures (total knowledge or total confidence). A majority of the lying measures were positively related to each other. General knowledge accuracy was positively related to general knowledge confidence ratings, $r(150) = .77$, $p < .001$.

Figure 8 shows an additional scatterplot matrix for SRP scores and contextual lying behaviour ratings, categorized by nine lying motives. The rating scale range in the contextual lying measures were limited to values between 1 and 5, with frequency distributions that were skewed and possessing less than ideal kurtosis. Moreover, despite having a regression line fitted to the plots, in many cases the relationships are likely not linear. This in turn limits

the interpretation of these scatterplots. Keeping in mind these caveats, SRP scores show no clear relationship with many of the lying contexts, except for positive relationships with the AE (lying to avoid embarrassment), AP (lying to avoid punishment), MP (lying to maintain privacy), and WA (lying to win admiration of others) contexts ($r(150) = .32, p < .001$, $r(150) = .35, p < .001$, $r(150) = .21, p < .01$, and $r(150) = .39, p < .001$, respectively).

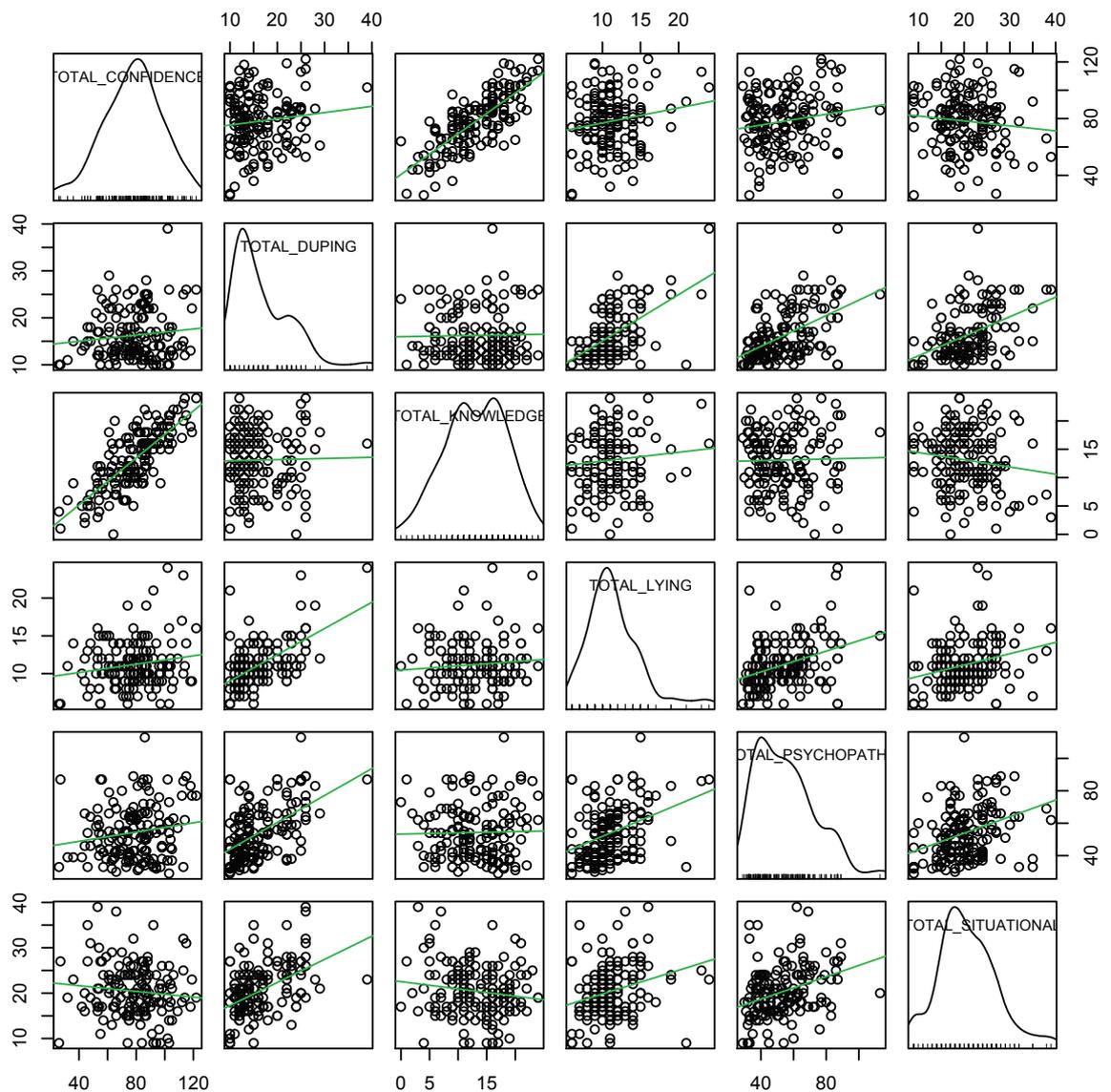


Figure 7. Scatterplot matrix comparing relationships between each pair of variables across samples. Diagonal plots are frequency distributions for each variable. Scatterplots above the diagonal plot the named variable on the x-axis and the other variable on the y-axis.

accuracy, general knowledge confidence ratings, and sample type. Psychopathy scores, general knowledge accuracy and general knowledge confidence ratings are continuous variables. (I also repeated the same regression analyses as a function of sample – student versus community – but the two samples did not appreciably differ in which variables were significant predictors of lying behaviours, so they are not reported in the results section. Analyses by sample can be found in Appendix J.)

To see if individuals with subclinical psychopathy have a greater inclination to lie, the first step involved conducting a multiple regression to examine whether the predictor variables predicted participants' evaluation of their lying frequency collapsed across student and community samples. Predictor variables and their corresponding regression coefficients are shown in Table 5. Using the enter method, psychopathy scores explained a significant amount of the variance in lying frequency ratings, with increased psychopathy predicting more frequent lying. Further, participants' confidence ratings of their general knowledge explained a significant amount of the variance in lying frequency scores, with increased confidence predicting more frequent lying, although the effect was much smaller than for SRP scores. Although including all four predictor variables (SRP score, general knowledge accuracy, general knowledge confidence, and sample type) accounted for a significant amount of the variance in lying frequency ratings, the effect appeared to be due solely to SRP scores, as indicated by the minimal change in R^2 from SRP alone as a predictor to using all four variables as predictors. In short, the findings indicate that as participants' psychopathy scores increased, the inclination to lie increased as well.

Table 5
 Summary of multiple regression analysis of the predictor variables on self-reported lying frequency across samples

Predictor Variable	Step 1			Step 2			Step 3			Step 4			Step 5		
	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.
Total SRP	.07	4.87	<.001***				.07	4.58	<.001***	.07	4.85	<.001***	.07	4.47	<.001***
Knowledge										.05	1.12	.26	-.04	-.97	.00
Confidence				.03	2.13	<.05*	.02	1.48	.14				.02	.99	.32
Sample Type													.19	.38	.70
<i>F</i> statistic	23.72***			4.55*			13.05***			12.51***			6.48***		
<i>R</i> ²	.14			.03			.15			.14			.15		
<i>R</i> ² _{Adjusted}	.13			.02			.14			.13			.13		

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

An additional multiple regression analysis was conducted across samples to gauge whether the predictor variables predicted participants' level of enjoyment as a result of successful deception (i.e., duping delight) (see Table 6). SRP scores accounted for a significant amount of the variance in participants' level of duping delight, both as the sole predictor and when combined with the other predictors, general knowledge performance, general knowledge confidence, and sample type. Aside from SRP scores and sample type, the other predictors did not account for a significant proportion of variance in duping delight. Thus, the findings suggest that as psychopathy scores increased, level of duping delight increased.

Table 6
Summary of multiple regression analysis of the predictor variables on level of duping delight collapsed across samples

Predictor Variable	Step 1			Step 2			Step 3			Step 4		
	<i>B</i>	<i>t</i>	Sig.									
Total SRP	.16	7.51	<.001***	.16	7.48	<.001***	.16	7.31	<.001***	.16	7.19	<.001***
Knowledge				.01	.12	.91				-.04	-.39	.70
Confidence							.01	.49	.63	.03	.86	.39
Sample Type										1.90	2.54	.01*
<i>F</i> statistic	56.39***			28.02***			28.17***			16.18***		
<i>R</i> ²	.27			.27			.27			.31		
<i>R</i> ² _{Adjusted}	.27			.26			.26			.29		

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

An additional set of regression analyses addressed whether psychopathic personality traits impact the contexts in which individuals engage in deceptive behaviour. Collapsed across samples, SRP scores were responsible for a significant amount of the variance in contextual lying behaviour (see Table 7). Although knowledge test performance, knowledge test confidence, and sample type were significant predictors of contextual lying behaviour, they were not significant predictors when combined with SRP scores, and only added a small amount to explaining the variance in contextual lying behaviour when combined with SRP scores. In short, as psychopathy scores increased, participants' contextual lying behavior increased as well.

Table 7

Summary of multiple regression analysis of the predictor variables on participants' situational lying scores across samples

Predictor Variable	Step 1			Step 2			Step 3			Step 4		
	<i>B</i>	<i>t</i>	Sig.									
Total SRP	.12	4.67	<.001***	.13	4.76	<.001***	.13	5.03	<.001***	.13	4.87	<.001***
Knowledge				-	-	<.05*				-.06	-.46	.64
				.17	2.01							
Confidence							-.05	-	<.05*	-.04	-	.31
								2.21			1.02	
Sample Type										1.73	1.92	.06
<i>F</i> statistic	21.80***			13.13***			13.62***			7.88***		
<i>R</i> ²	.13			.15			.16			.18		
<i>R</i> ² _{Adjusted}	.12			.14			.14			.15		

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

A regression analysis was also used to explore the role factors of psychopathy played in predicting lying behaviour. Across samples, Factor 1 accounted for a significant amount of the variance in participants' evaluation of their lying frequency, level of duping delight, and contextual lying behaviour ($F(1,150) = 19.75, p < .001, R^2 = .12, R^2_{Adjusted} = .11, F(1,150) = 63.49, p < .001, R^2 = .30, R^2_{Adjusted} = .29$ and $F(1,150) = 24.33, p < .001, R^2 = .14, R^2_{Adjusted} = .13$, respectively). Factor 1 was a significant predictor for each of the three outcome variables (lying frequency: $Beta = .11, t(151) = 4.44, p < .001$, duping delight: $Beta = .30, t(151) = 7.97, p < .001$, and contextual lying: $Beta = .23, t(151) = 4.93, p < .001$, respectively).

Similarly, Factor 2 was responsible for a significant amount of the variance in participants lying behaviour ratings ($F(1,150) = 21.21, p < .001, R^2 = .12, R^2_{Adjusted} = .12, F(1,150) = 33.03, p < .001, R^2 = .18, R^2_{Adjusted} = .18$ and $F(1,150) = 13.49, p < .001, R^2 = .08, R^2_{Adjusted} = .08$, respectively). Factor 2 significantly predicted participants' assessment of their lying behaviour ($Beta = .13, t(151) = 4.61, p < .001, Beta = .27, t(151) = 5.75, p < .001$ and $Beta = .20, t(151) = 3.67, p < .001$, respectively).

Further analyses were conducted to examine whether the above findings were present in each sample. In the student sample, Factor 1 was responsible for a significant amount of the variance in lying behaviour ratings ($F(1,89) = 14.58, p < .001, R^2 = .14, R^2_{Adjusted} = .13$, $F(1,89) = 40.51, p < .001, R^2 = .31, R^2_{Adjusted} = .31$ and $F(1,89) = 20.90, p < .001, R^2 = .19, R^2_{Adjusted} = .18$, respectively). Factor 1 significantly predicted all types of lying behaviour ($Beta = .11, t(90) = 3.82, p < .001, Beta = .29, t(90) = 6.37, p < .001$ and $Beta = .26, t(90) = 4.57, p < .001$, respectively).

Consistent with the above findings, variance in lying behaviour ratings for students was dependent on Factor 2 psychopathy scores ($F(1,89) = 12.26, p < .001, R^2 = .12, R^2_{Adjusted} = .11$, $F(1,89) = 27.01, p < .001, R^2 = .23, R^2_{Adjusted} = .22$ and $F(1,89) = 20.90, p < .001, R^2 = .19, R^2_{Adjusted} = .18$, respectively). Factor 2 was also a significant predictor of students' lying behaviour ($Beta = .13, t(90) = 3.50, p < .001, Beta = .32, t(90) = 5.20, p < .001$ and $Beta = .26, t(90) = 4.57, p < .001$, respectively).

In the community sample, Factor 1 explained a significant amount of the variance in participants' evaluation of their lying frequency and level of duping delight ($F(1,59) = 4.38, p < .05, R^2 = .07, R^2_{Adjusted} = .05$ and $F(1,59) = 18.98, p < .001, R^2 = .24, R^2_{Adjusted} = .23$, respectively). Factor 1 significantly predicted participants' lying frequency and duping delight ($Beta = .11, t(60) = 2.09, p < .05$ and $Beta = .30, t(60) = 4.36, p < .001$, respectively). However, Factor 1 scores did not significantly predict community participants' evaluation of their contextual lying behaviour.

Factor 2 accounted for a significant amount of the variance in community participants' assessment of their lying frequency and duping delight ($F(1,59) = 9.11, p < .01, R^2 = .13, R^2_{Adjusted} = .12$ and $F(1,59) = 9.15, p < .01, R^2 = .13, R^2_{Adjusted} = .12$, respectively). Factor 2 was a significant predictor of lying frequency and duping delight ($Beta = .14, t(60) =$

3.02, $p < .01$ and $Beta = .20$, $t(60) = 3.02$, $p < .01$, respectively), though Factor 2 did not significantly predict community participants' situational lying behaviour.

To investigate the effects of high and low psychopathy scores on participants' reported motivations for lying (lying contexts), a mixed ANOVA was conducted, with motivations for lying as the repeated measures factor and psychopathy level as the between subjects factor. High and low psychopathy groups were created using a median split based on SRP scores. Eta squared was used to determine the strength of this overall effect, where a small effect equals .01, a medium effect equals .06, and a large effect is attributed to .14 and above. Mauchly's test indicated that the assumption of sphericity was violated ($p = < .05$) for lying motivations and the interaction between psychopathy level and lying motivations, so the Greenhouse Geisser adjusted statistics are reported. A significant, large main effect of lying motives on reported contextual lying behaviour was obtained, $F(11.37, 1716.45) = 89.18$, $p < .001$, $\eta^2 = .29$. There was also a significant effect of participants' level of psychopathy on reported contextual lying behaviour ($F(1, 150) = 16.30$, $p < .001$) with a small effect ($\eta^2 = .03$). Further, there was a significant interaction between participants' level of psychopathy and reported motivations or contexts for lying ($F(11.37, 1716.45) = 2.63$, $p < .001$) with a small effect ($\eta^2 = .01$).

Fisher's Least Significant Difference (FLSD) was calculated to further investigate the difference between participants' level of psychopathy and reported motivations for lying. High and low psychopathy groups significantly differed ($p < .05$) for lies to avoid punishment (AP), obtain a reward (OR), win admiration of others (WA), avoid embarrassment (AE), and to maintain privacy (MP); for these comparisons, the high psychopathy group rated the likelihood of lying higher than the low psychopathy group. For the remainder of the motivations, high and low psychopathy group comparisons were not significantly different. In addition, Figure 9 shows that participants with both high and low

psychopathy levels were more likely to engage in deceptive behaviour to protect others and least likely to engage in deceptive behaviour to exercise power over others ($M = 3.53$, $SD = 1.16$ and $M = 1.44$, $SD = .97$, respectively), while the other lying motive ratings fell between these two extremes.

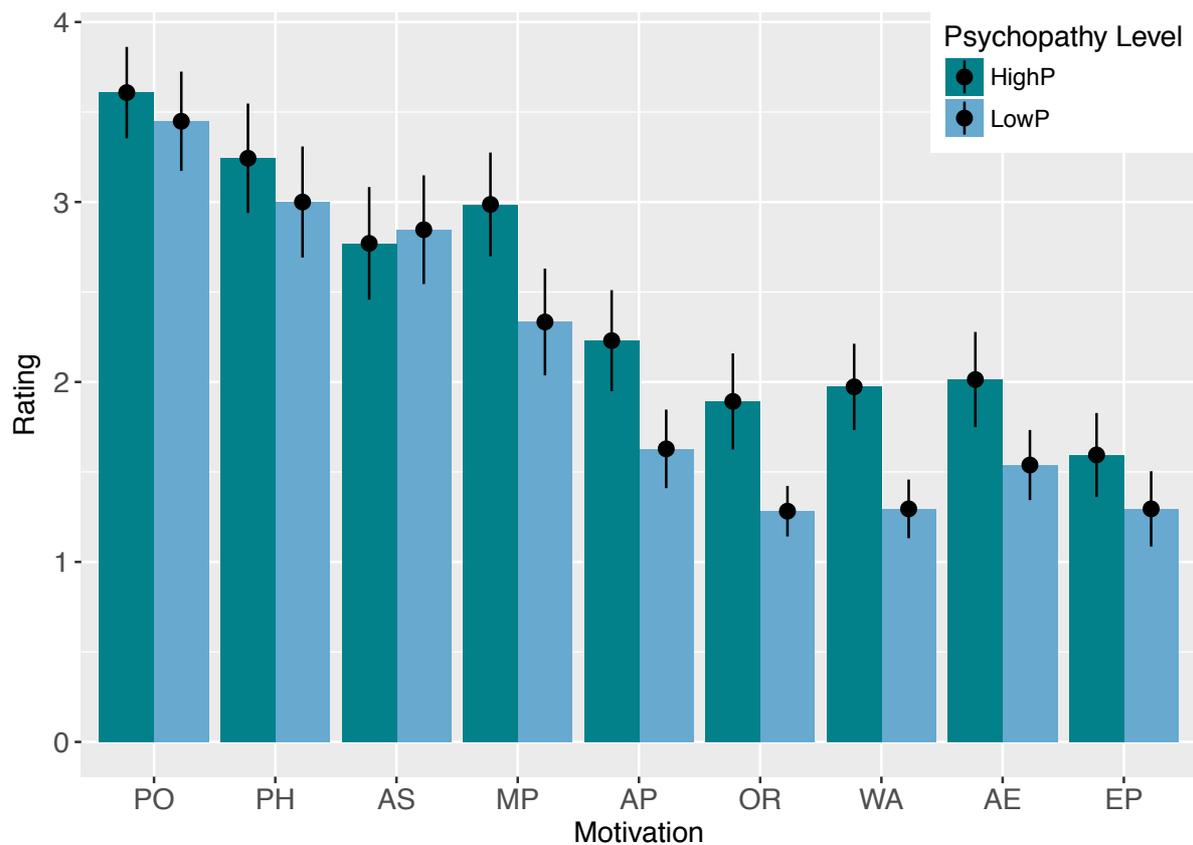


Figure 9. Mean situational lying ratings, categorized by lying motives and level of psychopathy (HighP = high psychopathy group; LowP = low psychopathy group). Error bars correspond to 95% confidence intervals. (PO = lying to protect others, PH = lying to protect oneself from harm, AS = lying to avoid awkward situations, MP = lying to maintain privacy, AP = lying to avoid punishment, OR = lying to obtain a reward, WA = lying to win admiration of others, AE = lying to avoid embarrassment, EP = lying to exercise power over others).

Discussion

The main goal of the present study was to investigate subclinical psychopathy as a predictor of lying behaviour, as measured by individuals' evaluation of their lying frequency, level of duping delight, and contextual lying behaviour. In addition, I examined whether performance on a test of general knowledge and confidence in the answers to the general knowledge test predicted lying. Overall, an increased level of psychopathy was correlated with increased reported lying frequency, level of duping delight, and contextual lying behavior collapsed across samples.

In general, these findings support my hypotheses that subclinical psychopathy predicts individuals' inclination to lie and their level of enjoyment when engaging in successful deception. However, the relationship between subclinical psychopathy and individuals' motivations for lying (i.e., situational or contextual lying) was mixed, indicating that increasing levels of subclinical psychopathy do not uniformly predict whether individuals will deceive others across situations. Moreover, no significant relation was found between confidence ratings and total SRP scores, contrary to my hypothesis that individuals with subclinical psychopathy would have higher confidence ratings.

The analysis of participants' contextual lying behaviour found a significant overall difference among motives for lying. More specifically, individuals were more inclined to engage in deceptive behaviour to protect others and less inclined to engage in lying to exercise power over others. The latter results were observed in each sample and when collapsed across samples. Thus, individuals are more likely to partake in altruistic lies and perceive them as more permissible and justifiable compared to lies for personal gain. These findings conflict with prior research exploring students' lying motives, which indicated that personal gain and maintaining interpersonal relationships were the key motivations involved in deception (Hample, 1980).

Limitations

Several factors could have impacted the present study's reliability and validity. The most prominent limitations were related to the research design. The first limitation was associated with the relatively homogenous sample: 65 percent of the sample were Caucasian individuals and approximately 70 percent of the sample were female. This homogeneity decreases the external validity of the study, making it difficult to generalize lying behaviour to men and individuals of other ethnic backgrounds with psychopathic personality traits. Although the study was comprised of a moderate sample size overall, the size of each sample group was relatively small, consisting of 91 students and 61 community members. This limitation possibly further reduced the generalizability and external validity of the study.

Further, several outliers were detected and not removed from the data set. This could have affected the significance of the results, particularly analyses as a function of sample type. However, what constitutes an outlier is debateable. For some scales (e.g., SRP), the natural distribution of values in the population is positively skewed, with only a few individuals having high scores. Removing these individuals from the analyses removes a key source of variability in the data and would distort the results. Another limitation is related to the recruitment process. Examining individuals' deceptive behaviour from a single undergraduate course and social media platform is not representative of undergraduate and community populations as a whole.

Lastly, assessing personality traits and behaviour using self-report measures are not without disadvantages. First, participants are more likely to report socially desirable responses when completing self-report questionnaires, which impacts the overall credibility of individuals' responses (Paulhus & Vazire, 2007). This may partially account for the low average ratings on reported lying frequency and level of duping delight in each sample. High ratings on the latter measures are attributed to increased lying frequency and level of

enjoyment during deception, which is considered socially unfavorable behaviour. Furthermore, self-presentation bias and impression management are conscious forms of socially desirable responses that could have influenced the overall findings. For instance, participants could have overemphasized the altruistic nature of their lies when evaluating the situations in which they would engage in deception. This would explain the drastic difference in participants' average lying motive ratings between lies to protect others and lies to exercise power over others. Similarly, there were several questions on the Modified SRP-III scale that asked about individuals' tendencies to engage in antisocial behaviour and other forms of misconduct. Thus, impression management and other explanations for socially desirable responses would account for the relatively low SRP scores obtained in each sample.

One factor that could have affected the limited contribution of the general knowledge test towards predicting lying behaviour is to increase the difficulty of the task. If questions are too easy, then confidence ratings may be more likely to reflect accuracy. An ideal mix of questions would include both easy questions and questions that were more challenging than the "difficult" questions included in the version used in the present study. One could argue that effects related to psychopathy may only emerge for more challenging questions, where a discrepancy may become apparent between accuracy and confidence (i.e., low accuracy but high confidence).

Future Research

Overall, the findings of the current study are consistent with a majority of prior studies which indicate that higher levels of psychopathy are associated with higher levels of lying behaviour. Further, the current study provided novel understanding regarding whether situational factors influence individuals' deceptive behaviour. However, the limitations addressed above make it exceptionally challenging to capture conclusive results about psychopaths' deceptive tendencies. Accordingly, I have identified several directions for

further research. First, in addition to the inclusion of more male participants and individuals from diverse ethnic backgrounds, researchers should examine the confidence ratings of inaccurate general information responses as a better indicator of overconfidence or include more difficult questions.

Second, further research should expand on the present study to include behavioural components of deception. Assessing behavioural components such as verbal and linguistic indicators of deception (Arciuli, Mallard, & Villar, 2010) would provide the research community with an enhanced understanding of whether individuals' perceived lying behaviour is consistent with their demonstrated lying behavior. It could also provide a more credible assessment of lying behaviour. For instance, Vru and Heaven (2010) found that speech disturbances increased when participants were asked to generate more complex lies. More recent research suggests that gaze diversion, head shaking, and speech errors are just a few of the deceptive indicators observed when participants were asked to produce "high-stake" lies (Wright, Wagstaff, & Wheatcroft, 2014). Participants also used fewer adjectives when asked to lie, as compared to those who were asked to tell the truth (Villar, Arciuli & Paterson, 2013)

Third, replicating this study in a clinical or forensic population would be beneficial in terms of investigating whether these findings differ in individuals that possess heightened levels of psychopathy. Replicating the study in a clinical setting could also assist in the evaluation of perceived lying behaviour in criminals who meet the criteria for psychopathy using the PCL-R (Hare, 1991). Finally, prior research indicated that the inclination to lie diminishes with age (Serota et al., 2010). Thus, more longitudinal studies could help researchers understand the development of psychopaths' lying behaviour in youth.

Conclusion

In the present study, I showed that psychopathy predicted self-reported lying behaviours. Additionally, I found partial support for the hypothesis that psychopathy predicts lying in some contexts more than others and that individuals with higher levels of psychopathy were more likely to lie in different settings than individuals with low levels of psychopathy. A future goal of work in this area would be to develop a model of lying behaviour, taking into account both personality characteristics and cognitive factors, such as working memory capacity and the ability to efficiently retrieve information that would support the lie. Although lying in some contexts has a low cognitive cost for the liar, in other contexts, perhaps where lies are more complex or need to fit into an evolving narrative, the cognitive cost may be higher. Taking the present work in a direction more directly connected to cognitive factors would allow the present work to move beyond the merely descriptive to a more theoretical level.

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Appendix A: Demographic Questionnaire

Demographic Questionnaire

1. What is your gender?
 - Male
 - Female
 - Other

2. What is your age?
 - a. 18-24 years
 - b. 25-34 years
 - c. 35-44 years
 - d. 45-54 years
 - e. 55-64 years
 - f. Age 65 or older

3. What is your ethnicity?
 - a. White
 - b. Black
 - c. East Indian
 - d. Asian
 - e. Middle Eastern
 - f. Aboriginal
 - g. Hispanic
 - h. Other
 - i. Please specify

4. Do you speak English fluently?
 - a. Yes
 - b. No

5. What is the highest level of education you have completed?
 - a. Less than high school
 - b. High school graduate
 - c. College graduate
 - d. Bachelor's degree
 - e. Master's degree
 - f. PhD
 - g. Other
 - i. Please specify

6. What is your current marital status?
 - a. Married
 - b. Separated
 - c. Divorced
 - d. Single
 - e. Widowed

- f. Other
 - i. Please specify
7. What is your employment status?
- a. Part-time
 - b. Full-time
 - c. Unemployed

Appendix B: Self-Reported Deception Scale

Self-Reported Deception Scale

The following statements deal with how you have behaved in the past. Please read each item carefully and rate how often you have done the following. There are no right or wrong answers, and you need not be an expert to complete this questionnaire.

1	2	3	4
Never	Rarely	Sometimes	Frequently

1. How often do you lie to a close friend or family member?
2. How often do you lie to a boss or professor?
3. How often do you lie just because you feel like it?
4. How often do you lie to law enforcement to get out of a difficult situation?
5. How often do you lie to a romantic partner?
6. How often do you lie to a stranger in a typical daily interaction?

Appendix C: Duping Delight Scale

Duping Delight Scale

The following statements deal with how you feel about certain activities surrounding lies. Please read each item carefully and rate the statements according to how you feel. There are no right or wrong answers, and you need not be an expert to complete this questionnaire.

*- Based on Ekman (1991); Rogers and Cruise (2000), and PCL-SV; (Hare, Cox, & Hart, 1996)

1	2	3	4
Never	Rarely	Sometimes	Frequently

1. How often do you get positive feelings out of telling a lie?
2. How often do you feel a sense of accomplishment by lying to another person and having them believe you?
3. How often do you get a sense of excitement or anticipation when thinking about telling a lie?
4. How often do you feel a sense of “contempt” towards the target of your lies?
5. How often do you put extra effort into lying or deceiving someone who is thought to be difficult to deceive?
6. How often do you increase your deceptive behavior if you had an audience watching and enjoying your performance?
7. How often do you tell an unlikely story and make it sound convincing?
8. How often do you alter a statement when challenged?
9. How often do you deceive others with self-assurance and little or no anxiety?
10. How often do you falsely project blame onto others just because?

Appendix D: Situational Lying Scale

Situational Lying Scale

Please rate the likelihood in which you would engage in the following situations.

1	2	3	4	5
Very Unlikely	Unlikely	Neutral	Likely	Very Likely

1. Amy lied to her professor about being sick to get out of writing her final exam
2. Cindy lied to her colleagues at a board meeting and pitched an idea that was not her own. The idea came from a member of her team and she claimed credit for it to get a promotion.
3. Mark lied to his parents by covering up for his brother when his brother arrived at the house past curfew.
4. Joe received a call from his friends asking him to come help them in a bar fight. Joe lied and said he had a family function, so he couldn't leave.
5. Sarah lied and stated that she volunteered at the homeless shelter and served their meals every Friday night, to impress her new colleagues.
6. Adam lies about having work the next day in order to be the designated driver for his friends at a party, to avoid drinking.
7. Karen always tells her friends to drop her off at a different street because she is ashamed of the neighborhood she lives in.
8. Kristen lies to her parents telling them that she is travelling to visit her best friend, when actually she is going to visit her boyfriend. Kristen's parents are unaware that she has a boyfriend.
9. James told his girlfriend that he would post a revealing picture of her on social media if she doesn't stay with him. James lied and doesn't actually have the picture.

Appendix E: General Knowledge Task

General Knowledge Task

The following questions are general information questions that vary in difficulty. For each question, PRINT your best guess in the space provided. The answer will always consist of exactly one word. There is no penalty for guessing incorrect answers, so be sure to take a guess. You will have 30 seconds to complete each question. After each question, please rate the degree of your confidence in the correctness of your answer.

1	2	3	4	5
Not confident at all	Not confident	Somewhat confident	Confident	Very confident

1. What is the name of the crime in which a building or property is purposely set on fire?

Answer: **ARSON**

Confidence rating:

2. Which precious gem is red?

Answer: **RUBY**

Confidence rating:

3. What is the name of the process by which plants make their food?

Answer: **PHOTOSYNTHESIS**

Confidence rating:

4. What is the name of the largest ocean on earth?

Answer: **PACIFIC**

Confidence rating:

5. What is the name of the city in Italy that is known for its canals?

Answer: **VENICE**

Confidence rating:

6. What is the last name of the man who proposed the theory of relativity?

Answer: **EINSTEIN**

Confidence rating:

7. What is the largest planet in our solar system?

Answer: **JUPITER**

Confidence rating:

8. What is the longest river in South America?

Answer: **AMAZON**

Confidence rating:

9. Which country was the first to use gunpowder?

Answer: **CHINA**

Confidence rating:

10. What is the name of the collar bone?

Answer: **CLAVICLE**

Confidence rating:

11. What is the name of the organ that produces insulin?

Answer: **PANCREAS**

Confidence rating:

12. What is the capital of Kenya?

Answer: **NAIROBI**

Confidence rating:

13. What is the name of Socrates' most famous student?

Answer: **PLATO**

Confidence rating:

14. What animal runs the fastest?

Answer: **CHEETAH**

Confidence rating:

15. What is the name of the palace in London in which the monarch of England resides?

Answer: **BUCKINGHAM**

Confidence rating:

16. What is the last name of the author of the book "1984"?

Answer: **ORWELL**

Confidence rating:

17. In what European city is the Parthenon located?

Answer: **ATHENS**

Confidence rating:

18. What is the capital of Australia?

Answer: **CANBERRA**

Confidence rating:

19. What was the name of King Arthur's sword?

Answer: **EXCALIBUR**

Confidence rating:

20. For which country is the Rupee the monetary unit?

Answer: **INDIA**

Confidence rating:

21. What is the last name of the author who wrote "Oliver Twist"?

Answer: **DICKENS**

Confidence rating:

22. What is the name of a giant ocean wave caused by an earthquake?

Answer: **TIDAL**

Confidence rating:

23. What is the capital of Finland?

Answer: **HELSINKI**

Confidence rating:

24. What is the name of the lizard that changes its color to match the surroundings?

Answer: **CHAMELEON**

Confidence rating:

25. What is the name of the furry animal that attacks cobra snakes?

Answer: **MONGOOSE**

Confidence rating:

Appendix F: Modified Self-Report Psychopathy Scale

Modified SRP-III

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

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

1. I'm a rebellious person.
2. I have never been involved in delinquent gang activity.
3. Most people are wimps.
4. I've often done something dangerous just for the thrill of it.
5. I have tricked someone into giving me money.
6. I have assaulted a law enforcement official or social worker.
7. I have pretended to be someone else in order to get something.
8. I like to see fist-fights.
9. I would get a kick out of 'scamming' someone.
10. It's fun to see how far you can push people before they get upset.
11. I enjoy doing wild things.
12. I have broken into a building or vehicle in order to steal something or vandalize.
13. I don't bother to keep in touch with my family any more.
14. I rarely follow the rules.
15. You should take advantage of other people before they do it to you.
16. People sometimes say that I'm cold-hearted.
17. I like to have sex with people I barely know.
18. I love violent sports and movies.
19. Sometimes you have to pretend you like people to get something out of them.

20. I was convicted of a serious crime.
21. I keep getting in trouble for the same things over and over.
22. Every now and then I carry a weapon (knife or gun) for protection.
23. You can get what you want by telling people what they want to hear.
24. I never feel guilty over hurting others.
25. I have threatened people into giving me money, clothes, or makeup.
26. A lot of people are “suckers” and can easily be fooled.
27. I admit that I often “mouth off” without thinking.
28. I sometimes dump friends that I don’t need any more.
29. I purposely tried to hit someone with the vehicle I was driving.

Appendix G: Informed Consent Undergraduates



Informed Consent

Title: Personality traits, lying behavior, and emotion

Date of ethics clearance: _____

Ethics Clearance for the Collection of Data Expires: _____

This study aims to understand the relationship between specific personality traits, the inclination to lie, and emotional reactions as a result of lying. **The researcher for this study is Farrah Helwa in the Institute of Cognitive Science, supervised by John Logan, professor in the Institute of Cognitive Science.** This study will take approximately 30 minutes to complete. To be eligible, you must be at least 18 years of age and speak English fluently. As compensation for your participation, you will receive 0.25% course credit for CGSC 1001- Mysteries of the Mind even if you withdraw from the study.

Your participation in this online study, using Qualtrics, will involve completing a lying behavior questionnaire, a questionnaire evaluating your emotional reactions as a result of lying, a situational lying questionnaire, a general knowledge task, and one personality questionnaire on a computer monitor. In addition, you will be asked to provide some personal demographic information. There are questions on the personality questionnaire that ask about personal feelings and previous antisocial behavior you may have engaged in or have considered engaging in. If you feel uncomfortable completing the study, you have the right to end your participation during the study session, for any reason, without penalty. You can withdraw by clicking the “Withdraw” option provided on every page or by closing the window. You will not be able to withdraw from the study once you have submitted the survey, as the information collected in the study is anonymous. If you withdraw by clicking the “Withdraw” button, you will be directed to the debriefing form. If you withdraw from the study, all the information you have provided will be immediately destroyed.

While risks in this study are expected to be minimal, I will take precautions to protect your identity. This will be done by keeping all responses anonymous and allowing you to request that certain responses not be included in the final project. Should you experience any distress during the study, you will be provided with contact information for counselling services available nearby.

Once the project is completed, all research data will be stored indefinitely on password-protected lab computers at Carleton University for future use in similar research. All research data will be password protected. Any hard copies of data (including any handwritten notes or USB keys) will be kept in a locked cabinet at Carleton University. Research data will only be accessible by the researcher and the research supervisor. As Qualtrics servers are in the United States, data will be subject to US laws on privacy and data security.

If you would like a copy of the finished research project, you are invited to contact the researcher to request an electronic copy which will be provided to you.

This study has been cleared by Carleton University Research Ethics Board-B (Clearance # 106027). Should you have any ethical concerns with the study, please contact Dr. Andy Adler (Chair, Carleton University Research Ethics Board-B, by phone: 613-520-2600 ext. 4085 or email: ethics@carleton.ca)

Researcher contact information:

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Supervisor contact information:

John Logan
Institute of Cognitive Science,

Carleton University

Email: johnlogan@mail.carleton.ca

Your consent is required for your participation in this study. By clicking “Yes”, you have read the above consent form and understand the conditions of your participation.

- Yes
- No

Appendix H: Informed Consent General Population



Informed Consent

Title: Personality traits, lying behavior, and emotion

Date of ethics clearance: _____

Ethics Clearance for the Collection of Data Expires: _____

This study aims to understand the relationship between specific personality traits, the inclination to lie, and emotional reactions as a result of lying. **The researcher for this study is Farrah Helwa in the Institute of Cognitive Science, supervised by John Logan, professor in the Institute of Cognitive Science.** This study will take approximately 30 minutes to complete and you will not receive any compensation for your participation. To be eligible, you must be at least 18 years of age and speak English fluently.

Your participation in this online study, using Qualtrics, will involve completing a lying behavior questionnaire, a questionnaire evaluating your emotional reactions as a result of lying, a situational lying questionnaire, a general knowledge task, and one personality questionnaire. In addition, you will be asked to provide some personal demographic information. There are questions on the personality questionnaire that ask about personal feelings and previous antisocial behavior you may have engaged in or have considered engaging in. If you feel uncomfortable completing the study, you have the right to end your participation in the study at any time, for any reason, without penalty. You can withdraw by clicking the “Withdraw” option provided on every page or by closing the window. You will not be able to withdraw from the study once you have submitted the survey, as the information collected in the study is anonymous. If you withdraw by clicking the “Withdraw” button, you will be directed to the debriefing form. If you withdraw from the study, all information you have provided will be immediately destroyed.

While risks in this study are expected to be minimal, I will take precautions to protect your identity. This will be done by keeping all responses anonymous and allowing you to request that certain responses not be included in the final project. Should you experience any distress during the study, you will be provided with contact information for counselling services available nearby.

Once the project is completed, all research data will be stored indefinitely on password-protected lab computers at Carleton University for future use in similar research. All research data will be password protected. Any hard copies of data (including any handwritten notes or USB keys) will be kept in a locked cabinet at Carleton University. Research data will only be accessible by the researcher and the research supervisor. As Qualtrics servers are in the United States, data will be subject to US laws on privacy and data security.

If you would like a copy of the finished research project, you are invited to contact the researcher to request an electronic copy which will be provided to you.

This study has been cleared by Carleton University Research Ethics Board-B (Clearance # 106027). Should you have any ethical concerns with the study, please contact Dr. Andy Adler (Chair, Carleton University Research Ethics Board-B, by phone: 613-520-2600 ext. 4085 or email: ethics@carleton.ca)

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Your consent is required for your participation in this study. By clicking “Yes”, you have read the above consent form and understand the conditions of your participation.

- Yes
- No

Appendix I: Debriefing Form



Personality traits, lying behavior, and emotion

We would like to thank you for your participation in this study. Your time and effort are greatly appreciated.

The goal of the present study was to see whether the presence of certain personality traits have an impact on the inclination to lie and one's emotional reactions as a result of lying. We also wanted to understand whether the inclination to lie was situational. We believe that individuals high in psychopathic traits will have a greater tendency to lie across situations and have less emotional reactions, as compared to individuals' low in psychopathic traits.

Previous research has shown a relationship between individuals with psychopathy and lying in clinical settings. Research has also found that individuals in the general population have varying degrees of psychopathic tendencies. However, research regarding the contexts in which deception is used has received less attention. Thus, the present study will allow us to explore whether certain features of psychopathy (i.e. tendencies to lie) are present in the general population as well as the research or clinical population. We were looking for a range of participants to partake in this study; thus, your participation does not imply that you have psychopathic traits.

As part of this study you have completed a lying behavior questionnaire, a questionnaire evaluating your emotional reactions as a result of lying, a situational lying questionnaire, a general knowledge task, and one personality questionnaire. The first was a questionnaire developed to measure frequency of lying. The second was a questionnaire developed to evaluate the level of enjoyment an individual receives from lying. The third measure was used to assess whether lying is situational or not. The fourth measure was used to assess individuals' perception of their task performance in comparison to their actual performance (objective performance). Finally, the last questionnaire was a measure of psychopathic personality characteristics. These traits are associated with manipulation and lying, lack of empathy, impulsive behavior, and a grandiose sense of self-worth.

Contact information for questions or concerns:

If you have any questions or comments about this study, please contact:
Farrah Helwa (Principal Investigator; farrahhelwa@cmail.carleton.ca, M. Cog. Sci. student)
or Dr. John Logan (Research Supervisor; johnlogan@cmail.carleton.ca).

Should you have any ethical concerns with the study, please contact Dr. Andy Adler (Chair, Carleton University Research Ethics Board-B, by phone: 613-520-2600 ext. 4085 or email: ethics@carleton.ca)

This study has been cleared by the Carleton University Research Ethics Board-B (Clearance # 106027).

If you experienced any psychological discomfort as a result of this study, please visit the following websites:

Carleton University Counselling Services: <http://www1.carleton.ca/health/counselling-services>.

Canadian Mental Health Association: <http://www.cmha.ca/>

World Health Organization: http://www.who.int/mental_health/en/

Appendix J: Multiple regression analyses as a function of sample type

Table 8

Summary of multiple regression analysis of the predictor variables on community members' self-reported lying frequency

Predictor Variable	Step 1			Step 2			Step 3			Step 4		
	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.
Total SRP	.08	2.84	<.01**	.07	2.66	<.05*	.07	2.56	<.05*	.09	3.18	<.01**
Knowledge				.12	1.62	.11				.28	2.39	<.05*
Confidence							.01	.27	.79	-	-	.09
<i>F</i> statistic	8.09**			5.46**			4.02*			4.79**		
<i>R</i> ²	.12			.16			.12			.20		
<i>R</i> ² _{Adjusted}	.11			.13			.09			.16		

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

Table 9

Summary of multiple regression analysis of the predictor variables on students' self-reported lying frequency

Predictor Variable	Step 1			Step 2			Step 3			Step 4			Step 5		
	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.
Total SRP	.07	3.89	<.001***	.07	3.88	<.001***	.06	3.76	<.001***				.06	3.56	<.001***
Knowledge				.02	.29	.77				-	-	.08	-	-	.16
Confidence							.03	1.59	.11	.07	2.56	<.05*	.05	2.11	<.05*
<i>F</i> statistic	15.16***			7.54***			8.98***			3.29*			6.71***		
<i>R</i> ²	.15			.15			.17			.07			.19		
<i>R</i> ² _{Adjusted}	.14			.13			.15			.05			.16		

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

Table 10
 Summary of multiple regression analysis of the predictor variables on students' level of duping delight

Predictor Variable	Step 1			Step 2			Step 3			Step 4			Step 5		
	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.	<i>B</i>	<i>t</i>	Sig.
Total SRP	.17	6.25	<.001***	.17	6.21	<.001***	.17	6.12	<.001***				.16	5.91	<.001***
Knowledge				.01	.14	.89									
Confidence							.04	1.37	.17	.32	1.87	.06	.20	1.39	.17
<i>F</i> statistic	39.00***			19.30***			20.64***			3.13*			14.55***		
<i>R</i> ²	.31			.31			.32			.07			.33		
<i>R</i> ² _{Adjusted}	.30			.29			.30			.05			.31		

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

Table 11
 Summary of multiple regression analysis of the predictor variables on community participants' level of duping delight

Predictor Variable	Step 1			Step 2			Step 3			Step 4		
	<i>B</i>	<i>t</i>	Sig.									
Total SRP	.15	4.05	<.001***	.14	3.92	<.001***	.15	3.96	<.001***	.17	4.41	<.001***
Knowledge				.07	.71	.48				.32	1.92	.06
Confidence							-.01	-.51	.61	-.09	-	.07
<i>F</i> statistic	16.43***			8.40***			8.24***			6.98***		
<i>R</i> ²	.22			.23			.22			.27		
<i>R</i> ² _{Adjusted}	.21			.20			.20			.23		

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

Table 12
 Summary of multiple regression analysis of the predictor variables on students' situational lying scores

Predictor Variable	Step 1			Step 2			Step 3			Step 4		
	<i>B</i>	<i>t</i>	Sig.									
Total SRP	.15	4.56	<.001***	.15	4.55	<.001***	.16	4.65	<.001***	.15	4.50	<.001***
Knowledge				-	-	.17				-.13	-.74	.46
Confidence				.16	1.38		-.04	-	.24	-.01	-.20	.84
								1.17				
<i>F</i> statistic	20.74***			11.42***			11.10***			7.55***		
<i>R</i> ²	.19			.21			.20			.21		
<i>R</i> ² _{Adjusted}	.18			.19			.18			.18		

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