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Differentiating Darkness: Decision-making Differences Between Psychopathy and Machiavellianism

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DIFFERENTIATING DARKNESS: DECISION-MAKING
DIFFERENCES BETWEEN PSYCHOPATHY
AND MACHIAVELLIANISM

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Dedication

For my mom, David and grandparents.

None of this would have been possible without you.

DIFFERENTIATING DARKNESS: DECISION-MAKING
DIFFERENCES BETWEEN PSYCHOPATHY
AND MACHIAVELLIANISM

by

JESSICA ROSE CARRE, M.A.

DISSERTATION

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Abstract

Machiavellianism and psychopathy are correlated but distinct personality traits that are associated with interpersonal manipulation and selfish behaviors (Paulhus & Williams, 2002). Based on a recent meta-analytic review, researchers have questioned whether these traits are distinct (Miller, Hyatt, Maples-Keller, Carter & Lynam, 2016). These meta-analytic reviews, however, have largely been based on atheoretical studies examining the relationship of these traits with self-reported outcomes. The purpose of the present research was to directly test the differences between Machiavellianism and psychopathy with respect to fundamental decision-making processes. In study one, the difference between psychopathy and Machiavellianism was assessed in terms of passive avoidance learning (a core finding in psychopathy research). Results of study one indicates that Machiavellianism is not significantly related to the attentional deficits associated with psychopathy. Further, the effect of psychopathy on passive avoidance learning in this study is significantly affected by gender, highlighting the importance of considering gender in examining the attentional deficits considered to be a core feature of psychopathy. Study two compared the behavioral flexibility of those higher in psychopathy and Machiavellianism using a prisoner's dilemma task. Contrary to previous research, there is not a significant effect of Machiavellianism or psychopathy on selfish behavior in a consequence free condition. However, it is likely this finding is due to infrequency of participants' behaving selfishly in this study. Nevertheless, those higher in Machiavellianism did tend to behave less selfishly when they perceived their partner as valuable to their future success. The implications of these findings are discussed.

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Chapter 1: Introduction

Psychopathy and Machiavellianism are two personality traits associated with selfish and manipulative behavior (Furnham, Richards & Paulhus, 2013). Indeed, both traits share a common core of callousness and manipulation (Jones & Figueredo, 2013). Despite these similarities, however, psychopathy and Machiavellianism were studied separately for many years (D'Souza & Jones, 2017). This trend changed with Paulhus and Williams' (2002) publication noting the correlation between the two traits and their call to consider these traits together when exploring antisocial outcomes. With increased research examining both traits, however, some have re-questioned whether these are actually distinct traits or whether they are the same trait studied in different fields (McHoskey, Worzel & Szyarto, 1998). The present research examines the uniqueness of psychopathy and Machiavellianism based on theoretical distinctions between the two traits.

In 1941, Hervey Cleckley published an introduction to the personality trait psychopathy based on his experiences as a clinician (1982). Although the term psychopathy was used before this publication, Cleckley (1982) published the first set of criteria defining this construct. He defined psychopathy as consisting of sixteen traits including¹: superficial charm, lack of remorse, poor judgment, failure to learn by experience, pathologic egocentricity and incapacity for love (Cleckley, 1982). Cleckley's (1982) definition has remained influential throughout the years with current conceptualizations of the trait inspired by these criteria.

A few decades after Cleckley's publication, Christie and Geis (1970) published a series of studies on a new personality trait termed Machiavellianism. Machiavellianism as a construct was defined as dispositional agreement with writings such as Niccoló Machiavelli's *The Prince* (Machiavelli, 1513/1981). This philosophy can best be summarized through the phrase: "the ends justify the means." Through their operationalizations of Machiavellianism (with the

¹ The traits most relevant to the issues considered in the subsequent studies are listed for the sake of concision. For a full list of the traits please see Cleckley (1982).

most popular being the Mach-IV), they found three central themes: manipulation, amorality, and cynicism. They argued that these three aspects constitute the core of the Machiavellianism construct.

Although psychopathy and Machiavellianism are similar, insofar as they both represent propensities towards selfish and antisocial behavior, they have mostly been studied separately. Specifically, psychopathy has primarily been studied from the perspectives of clinical psychology, forensic psychology and criminal justice, whereas Machiavellianism has primarily been studied from social, personality and industrial/organizational psychology perspectives (D'Souza & Jones, 2017; McHoskey et al., 1998). As such, there have been several theoretical and empirical articles published over the years which have questioned whether these are merely the same trait studied in different areas (McHoskey et al., 1998). Others still, have argued that even though the construct definitions of psychopathy and Machiavellianism may be different, their operationalizations are redundant (Miller et al., 2016). As psychopathy tends to have larger effect sizes with respect to antisocial outcomes, Machiavellianism is the construct that is considered unnecessary (Muris, Merckelbach, Otgaar & Meijer, 2017).

ARGUMENTS AGAINST UNIQUENESS

Many arguments against the uniqueness of Machiavellianism, with respect to psychopathy, have focused on similarities between the two. For example, McHoskey and colleagues (1998) contended that Machiavellianism is a general measure of psychopathy based on their findings that both traits had similar correlations with specific self-reported outcomes. For example, both traits negatively predicted impression management, prosocial behavior, and cooperation (McHoskey et al., 1998). Further, both Machiavellianism and psychopathy were also positively associated with the forceful dimension of the personality adjective scale (McHoskey et al., 1998). Similarly, researchers found similarities between these traits and parenting styles, internalizing problems, externalizing problems, and risky sex using self-report and informant reports (Miller et al., 2016). A meta-analytic review has also shown that both psychopathy and

Machiavellianism are positively associated with impulsivity, sensation-seeking, social dominance, short-term mating and aggression (Vize, Lynam, Collison & Miller, 2016). Both personality traits were also associated with less emotional intelligence and a lack of empathy (Vize et al., 2016). Thus, across a series of studies and reviews Machiavellianism and psychopathy have similar correlations with self-reported outcomes.

Researchers have also based arguments against the distinctiveness of Machiavellianism and psychopathy on the similarities between the Five Factor Model profiles of these traits. In examining the uniqueness of psychopathy and Machiavellianism from a Five Factor Model (FFM) approach, researchers highlight that both traits have negative associations with agreeableness and conscientiousness (Paulhus & Williams, 2002). Indeed, these associations have emerged in three separate meta-analytic reviews (Muris et al., 2017; O’Boyle, Forsyth, Banks, Story & White, 2015; Vize et al., 2016). Further, examinations of these relationships at the facet level of the FFM indicated that psychopathy and Machiavellianism are both negatively associated with all facets of agreeableness, as well as the conscientiousness facets: order, dutifulness, self-discipline, and deliberation (Miller et al., 2016). Additionally, the profile similarities of the correlations of Machiavellianism and psychopathy with the FFM facets were estimated to be close to one (specifically, .90; Miller et al., 2016). Others still have meta-analytically examined the relationship between these traits and the HEXACO factor of honesty-humility at the facet level (Muris et al., 2017). As expected, psychopathy and Machiavellianism were negatively correlated with all facets of honesty-humility (Muris et al., 2017).

Note, however, researchers have found different associations of psychopathy and Machiavellianism with the FFM traits – particularly the factors openness to experience, neuroticism, and extraversion – depending on the measure used to assess these traits (O’Boyle et al., 2015; Vize et al., 2016). These results indicate that there is some degree of divergence between the available measures insofar as their conceptualization of psychopathy and Machiavellianism – at least from a FFM perspective. Nevertheless, there seems to be relative consensus that Machiavellianism and psychopathy are both negatively associated with the

agreeableness and conscientiousness factors of the FFM and the honesty-humility factor of the HEXACO model of personality (Lee & Ashton, 2005).

Researchers examining these traits in forensic samples have similarly echoed concerns regarding the measures used to assess Machiavellianism and psychopathy, arguing that the existing measures are redundant (Glenn & Sellbom, 2015). Specifically, these researchers have noted the high degree of similarity between items and factors across available measures of Machiavellianism and psychopathy (Glenn & Sellbom, 2015). This measurement concern has led researchers to suggest that if there is a theoretical distinction between Machiavellianism and psychopathy, it is not currently represented in the measures used to assess each trait (e.g., Miller et al., 2016). To test the possibility that theoretical distinctions between psychopathy and Machiavellianism are not represented in the measures available, researchers had experts on Machiavellianism complete FFM assessments based on how the typical Machiavellian individual would respond (Miller et al., 2016). Researchers then compared this FFM profile generated for the typical Machiavellian to a FFM profile previously generated for the typical psychopath (Miller et al., 2016). Analysis indicated that these expert generated FFM profiles for psychopathy and Machiavellianism were more distinct from each other than were the FFM profiles generated from self-report measures of the traits (Miller et al., 2016). These findings indicate that there might in fact be a theoretical distinction between Machiavellianism and psychopathy that is not captured in current measurements (Miller et al., 2016).

Unfortunately, few studies exist which directly compare the fundamental theoretical assumptions of psychopathy and Machiavellianism. Muris and colleagues (2017) noted that about three-quarters of the studies which examined both traits were cross-sectional, survey studies, not focused on conceptual distinctions between the traits. Further, though there may be associations expected of psychopathy and Machiavellianism with FFM traits based on extant theories, there are not specific theoretical arguments about these associations. Thus, although profile similarities between the relationships of psychopathy and Machiavellianism with FFM traits may indicate a lack of theoretical distinction in measurement, these similarities do not

directly establish a lack of distinction between the traits. Indeed, the large credibility intervals found in one of the meta-analyses examining these associations supports the possibility that there may be moderating variables affecting the associations of psychopathy and Machiavellianism with FFM traits (O’Boyle et al., 2015). Therefore, prior to adopting the view that almost fifty years of research on Machiavellianism really reflects findings relevant to psychopathy (e.g., Miller et al., 2016), it is necessary to first directly test whether the available measures adequately assess the theoretical distinctions between these traits.

THEORETICAL DISTINCTIONS

Since Christie and Geis’ (1970) publication, several theories have emerged that attempted to clarify the definition of Machiavellianism and distinguish its central features from related constructs (Jones & Paulhus, 2009). For example, Jones and Paulhus (2009; 2011) first proposed that impulse control was a key factor distinguishing Machiavellianism from psychopathy. Jones and Paulhus (2011) further argued that although both share a similar interpersonal disposition (high dominance, low nurturance) a moderator, temporal orientation, differentiated the two; whereas psychopathic individuals were considered short-term oriented, Machiavellian individuals were considered to be long-term oriented. These theories, however, were not supported by empirical evidence.

Most recent evidence, however, supports the view that unlike those high in psychopathy, individuals high in Machiavellianism can moderate their behavior based on external cues to punishment and reward. Specifically, it is proposed that those higher in Machiavellianism behave selfishly only when they cannot be punished for such behavior. This ability has been termed behavioral flexibility (Bereczkei, 2015). In contrast, those higher in psychopathy theoretically lack this flexibility (Jones, 2016). Indeed, a key finding in the psychopathy literature is that those higher in psychopathy focus on cues to reward in goal-directed activities, to the exclusion of learning the association between cues and punishment (i.e., poor passive avoidance learning; Smith & Lilienfeld, 2015). Poor passive avoidance learning is antithetical to behavioral

flexibility as one can only moderate their behavior in accordance with cues to punishment if one recognizes these as cues to punishment. These distinctions are considered in more depth below.

Psychopathy and Passive Avoidance Learning

A well-studied finding in psychopathy research is that those higher in psychopathy continue responding when pursuing a goal despite cues to punishment (Smith & Lilienfeld, 2015). In his seminal study, Lykken (1957) had individuals complete a mental maze task in which they choose between one of four choices at a series of fifteen points. One of the choices would allow the individual to continue through the maze, whereas one of the other choices would elicit a shock. The remaining two choices did not elicit a punishment, nor allow the participant to advance through the maze. The explicit goal of the task was to complete the maze as quickly as possible. Participants were not told about the relationship between one of the choices and punishment at the outset of the experiment; participants were expected to learn this contingency. Results indicated that psychopaths continued choosing the direction that elicited a shock longer than non-psychopaths. In this way, psychopaths exhibited poor passive avoidance learning insofar as they failed to learn the un-stated contingency between one of the options and an electric shock. Lykken (1957) further postulated that psychopaths exhibited this poor passive avoidance learning because psychopaths lacked a fundamental fear of the punishment stimulus.

Subsequent research attempted to replicate Lykken's (1957) findings with different types of punishment stimuli (Schmauk, 1970). In this study, participants were also tasked with completing a mental maze (Schmauk, 1970). However, participants were randomly assigned to receive one of three punishment types: physical punishment (i.e., a shock), verbal punishment (i.e., being told "wrong") or monetary punishment (i.e., losing money). Psychopathic participants continued choosing the punishment option longer than the non-psychopathic participants only in the physical punishment and verbal punishment conditions. In the monetary condition, however, psychopathic participants' performed as well as non-psychopathic participants in terms of avoiding punishment. This finding indicated that psychopaths do not exhibit a general deficit in

passive avoidance learning, but rather are only motivated to avoid certain types of punishment (Schmauk, 1970).

Researchers have questioned Schmauk's (1970) interpretation, suggesting that his findings in the monetary condition were instead due to the lack of a potential reward included in this condition. Specifically, in the monetary condition participants were not able to earn money – only prevent the loss of money. To test the importance of reward in the passive avoidance learning of psychopaths, researchers conducted a study in which participants completed a Go/No-Go task under one of two conditions: (1) reward and punishment possible or (2) only punishment possible (Newman & Kosson, 1986). In the Go/No-Go task participants were sequentially presented with numeric stimuli; responding – by pressing a button – to some of the numbers would result in a punishment (i.e., monetary loss), whereas responding to other numbers would result in a reward (i.e., monetary gain) in the condition in which reward was possible. Participants were tasked with learning the stimuli to which they should respond and the stimuli to which they should not respond. As expected, psychopathic participants exhibited poor passive avoidance learning only in the reward and punishment condition (i.e., not in the punishment only condition).

The finding that psychopaths exhibited poor passive avoidance learning only when there was the possibility for reward was replicated in later studies (e.g., Newman, Patterson, Howland & Nichols, 1990). Indeed, those higher in psychopathy only demonstrate poor passive avoidance when in pursuit of a reward (Newman & Kosson, 1986), when they are not made aware of the punishment contingency beforehand (Newman et al., 1990), and when feedback is not provided at intervals during the task (Newman, Patterson & Kosson, 1987). Overall then, when engaged in goal-directed tasks, those higher in psychopathy generally fail to attend to cues to punishment. This lack of attention to punishment cues then leads high psychopathy individuals to continue behaving in a manner that elicits punishment longer than those lower in this trait.

Machiavellianism and Behavioral Flexibility.

The critical theoretical difference between Machiavellianism and psychopathy lies in the theorized flexibility of Machiavellian behavior. Specifically, those higher in Machiavellianism are expected to consider situational factors when making decisions (Bereczkei, 2015; Christie & Geis, 1970; Jones, 2016). This is in contrast to the myopic focus on reward demonstrated by those higher in psychopathy. For example, in Public Goods Games (PGGs) the contributions of those higher in Machiavellianism were significantly affected by the context of the PGG. In one such study, the contributions of those higher in Machiavellianism in a PGG were found to be largely associated with the number of altruists or free riders in the game, whereas the contributions of those lower in Machiavellianism were largely influenced by participants' own personality traits (Bereczkei & Czibor, 2014). A similar study found that the contribution of individuals with higher Machiavellianism scores were more influenced by the contributions of the other participants in the PGG than were individuals with lower Machiavellianism scores (Czibor & Bereczkei, 2012). Together, these findings support that those higher in Machiavellianism are more sensitive to situational factors, at least compared to those lower in Machiavellianism.

This consideration of situational factors is considered adaptive insofar as it allows those higher in Machiavellianism to maximize reward (Jones, 2016). Indeed, those higher in Machiavellianism tend to earn more money than those lower in Machiavellianism at the end of PGGs (e.g., Bereczkei & Czibor, 2014; Czibor & Bereczkei, 2012). The fact that those higher in Machiavellianism end such games with more money is potentially due to their greater consideration of the context of the game. For instance, when playing a social dilemma game with another person, those higher in Machiavellianism only behaved selfishly when the other person could not punish them (Spitzer, Fischbacher, Hernberger, Gron & Fehr, 2007). In contrast, there was not an effect of Machiavellianism when participants could be punished by their partner for behaving selfishly (Spitzer et al., 2007). In this way, those higher in Machiavellianism were able to extract greater reward by behaving more selfishly when they could not be punished, while also

avoiding punishment by not behaving selfishly when punishment was possible (Spitzer et al., 2007). This flexible strategy then leads to the maximization of rewards.

Although many of the studies examining the behavioral flexibility of Machiavellians involve monetary reward, Machiavellian behavioral flexibility has also been examined in charity offers (Bereczkei, Birkas & Kerekes, 2010). Specifically, participants in one such study made offers to engage in charitable activities either privately or in front of their classmates (Bereczkei et al., 2010). Results indicated that those higher in Machiavellianism were less likely to volunteer for charitable activities. However, there was also a significant interaction between Machiavellianism and condition such that there was only an effect of Machiavellianism on charity offers made in private. When charity offers were made privately, those higher in Machiavellianism made significantly fewer offers to volunteer for a charity. However, there was no significant effect of Machiavellianism on charity offers made publically (Bereczkei et al., 2010). The researchers theorized that this effect was due to reputational concerns; those higher in Machiavellianism did not make significantly different charity offers in public due to concerns that their classmates would perceive them negatively (Bereczkei et al., 2010).

The interpretation that those higher in Machiavellianism only behaved selfishly in private due to reputational concerns is supported by previous findings regarding public charity offers. In another study on charity offers made publically versus privately, researchers found that the reputations of those who made charity offers publically increased, whereas the reputations of those who publically did not make charity offers somewhat decreased (Bereczkei, Birkas & Kerekes, 2007). Further, several studies have shown that those higher in Machiavellianism will engage in prosocial behaviors, but only as a strategy to further their own goals. As an example, those higher in Machiavellianism will engage in reciprocity when this is the most expedient route to their reward (Spitzer et al., 2007). Furthermore, those higher in Machiavellianism will engage in organizational citizenship behaviors (i.e., tasks outside of one's defined job, but which are of critical importance to the overall success of the company) in order to maintain a good impression of themselves among their co-workers and bosses rather than out of prosocial concern for others

(Becker & O'Hair, 2007). Thus, one difference between those lower in Machiavellianism and those higher in this trait is that higher scorers behave pro-socially as a means to maintaining a positive reputation rather than a goal in and of itself. Overall then, those higher in Machiavellianism tend to consider the consequences associated with potential actions before deciding on a course of action (Bereczkei, 2015).

Support for Theoretical Distinctions

In reviewing the extant literature on Machiavellianism and psychopathy, these traits have many similarities, in line with concerns about the distinctiveness of these traits (e.g., Miller et al., 2016). For example, both those high in Machiavellianism and psychopathy behave in selfish ways in order to achieve their goals (Jones, 2013). These traits are also both associated with reduced levels of trait empathy (Wai & Tiliopoulos, 2012) and social exploitativeness (Jonason, Koenig & Tost, 2010). There are, however, several studies that directly compare these two traits and support the theoretical distinction that Machiavellianism is defined by a behaviorally flexible decision-making style, which is not true of psychopathy.

In a series of studies directly comparing the behavior of high psychopathy individuals to that of high Machiavellianism individuals, participants were given the chance to gamble with another person's money (Jones, 2013; Jones, 2014). Participants were allowed to keep the winnings, whereas the other person suffered all losses (Jones, 2013; Jones, 2014). In a consequence-free environment, where participants could not be punished for losses, both Machiavellianism and psychopathy predicted gambling with another's money (Jones, 2013). Yet, when the possibility of punishment was introduced, only psychopathy predicted gambling with another's money (Jones, 2014). These studies support the conclusion that, although those higher in psychopathy, as well as Machiavellianism, are willing to engage in selfish and manipulative behavior, only those higher in Machiavellianism consider the consequences of such behavior.

The flexibility of Machiavellian behavior has also been demonstrated using cheating paradigms. For example, in a series of studies Jones and Paulhus (2017) examined the

relationships of psychopathy and Machiavellianism with behavioral indices of cheating. In this study, both traits were associated with cheating under low-risk situations (Jones & Paulhus, 2017; Study 1). However, only psychopathy was associated with cheating when the potential for punishment was introduced (Jones & Paulhus, 2017; Study 2). This deliberate approach to misbehavior characteristic of Machiavellianism was also supported in real-life examinations of scholastic cheating behavior (Nathanson, Paulhus & Williams, 2006; Williams, Nathanson & Paulhus, 2010). Specifically, psychopathy was associated with copying off another student's exam (Nathanson et al., 2006) – a cheating strategy which comes with a high risk of detection – as well as plagiarism which has a lower risk of detection² (Williams et al., 2010). In contrast, Machiavellianism was only predictive of the lower risk cheating strategy of plagiarism (Williams et al., 2006). The findings across these studies again support the behaviorally flexible style of Machiavellian decision-making and the situation-independent behavior characteristic of psychopathy.

The reduced attention to cues of punishment in pursuit of rewards is characteristic of psychopathy and stands in contrast with the greater sensitivity towards punishment that is characteristic of Machiavellianism. This distinction has emerged in several studies examining the Behavioral Activation System (BAS) and the Behavioral Inhibition System (BIS; Gray, 1982). Briefly, BAS is associated with sensitivity to and pursuit of reward, whereas BIS is associated with sensitivity to punishment cues and novelty (Grey, 1982). Studies examining psychopathy have found it to be negatively correlated with BIS, as well as the related dimension of Fight, Flight, or Freeze (FFF; Jonason & Jackson, 2016; Neria, Vizcaino & Jones, 2016; Stenason & Vernon, 2016). Additionally, in two studies psychopathy was positively associated with aspects of BAS (Neria et al., 2016; Stenason & Vernon, 2016) or uncorrelated with BAS (Jonason & Jackson, 2016). In this way, these findings suggest that those higher in psychopathy tend to be less concerned with punishment cues and relatively more sensitive to reward. In contrast,

² Note that students were not told their paper would be examined using any program designed to detect plagiarism.

Machiavellianism has been variously positively correlated (Jonason & Jackson, 2016) or uncorrelated with BIS and FFF (Neria et al., 2016; Stenason & Vernon, 2016). Furthermore, Machiavellianism was positively associated with BAS in one study (Stenason & Vernon, 2016) and uncorrelated with BAS in another two studies (Jonason & Jackson, 2016; Neria et al., 2016). Thus, in contrast to the findings regarding psychopathy and BIS/BAS, those higher in Machiavellianism appear slightly more sensitive to punishment cues.

The combination of reduced BIS and increased BAS – found for those higher in psychopathy – may indicate a tendency towards impulsivity (Carver & White, 1994). Indeed, investigations have found the associations of psychopathy and Machiavellianism with impulsivity diverge, as do their relationships with BIS and BAS. In a study examining the relationship of psychopathy and Machiavellianism with impulsivity there was a significant positive correlation between psychopathy and five of the six factors³ on Barratt's Impulsivity Scale (Maesza & Ostaszewski, 2016). Psychopathy was also positively associated with the impulsivity factor of the I₇ which was created to assess Eysenck's conceptualization of impulsivity (Maesza & Ostaszewski, 2016). Machiavellianism, however, was positively correlated with only two of the six factors⁴ on Barratt's Impulsivity Scale and was uncorrelated with the impulsivity factor of the I₇ (Maesza & Ostaszewski, 2016).

Similarly, researchers have examined the relationship of psychopathy and Machiavellianism with impulsivity as conceptualized by Dickman (1990). Dickman differentiated between functional impulsivity (e.g., quick responding in settings in which this is beneficial) and dysfunctional impulsivity (e.g., quick responding in settings in which this is not beneficial; Dickman, 1990). Researchers found that psychopathy was consistently and most strongly associated with dysfunctional impulsivity (Jones & Paulhus, 2011). Machiavellianism, however, was uncorrelated with both types of impulsivity in one study and positively correlated

³ Specifically, psychopathy was positively correlated with the factors: attention, motor impulsivity, cognitive complexity, perseverance, and cognitive impulsivity. Psychopathy was uncorrelated with the self-control factor.

⁴ Machiavellianism was positively correlated only with the factors perseverance and cognitive instability.

with dysfunctional impulsivity in a second study (Jones & Paulhus, 2011). Generally, these findings suggest that in self-report assessments psychopathy is most strongly associated with impulsivity, whereas the relationship between Machiavellianism and impulsivity is at least less robust.

The relationship of psychopathy and Machiavellianism with impulsivity has also been examined in behavioral assessments. In such a study, participants completed a stop signal task (Maesza & Ostaszewski, 2016). In this task, participants were instructed to respond in the presence of a visual cue and inhibit responding as soon as they heard an auditory cue to stop responding (Maesza & Ostaszewski, 2016). Behavioral inhibition was indexed as the amount of time taken to stop responding (Maesza & Ostaszewski, 2016). Again, psychopathy was associated with greater time to stop responding, whereas Machiavellianism was unrelated to the amount of time taken to stop responding (Maesza & Ostaszewski, 2016). These behavioral indices of impulsivity support the finding from self-report research that psychopathy is strongly associated with impulsivity. Machiavellianism, however, was unrelated to either behavioral index of impulsivity.

A pattern of findings emerges when considering the findings across the studies in which psychopathy and Machiavellianism were directly compared. Specifically, psychopathy is associated with a greater insensitivity to punishment and an impulsive behavioral style. Machiavellianism, on the other hand, is associated with a flexible behavioral style in which those higher in the trait consider the potential consequences to any actions prior to deciding on an action. Thus, it is expected that those high in psychopathy, as well as those high in Machiavellianism, will take advantage of situations in which one is unlikely to experience negative outcomes as a result of selfish or manipulative behavior. Nevertheless, in situations in which punishment is possible it is expected that only those high in psychopathy – not those high in Machiavellianism – will behave in a selfish or manipulative manner (Jones & Paulhus, 2017).

SUMMARY & PRESENT STUDIES

In sum, the primary theoretical distinction between Machiavellianism and psychopathy is that those higher in Machiavellianism alter their behavior in accordance with external cues in order to obtain the greatest amount of reward possible (e.g., Bereczkei et al., 2014). In contrast, those higher in psychopathy generally fail to attend to un-specified external cues to punishment when pursuing a goal (e.g., Newman et al., 1990). As Machiavellianism and psychopathy share a common core of callousness and manipulation (Jones & Figueredo, 2013), both traits will be associated with a propensity for engaging in antisocial behavior. The expectation then is not that those higher in Machiavellianism will behave in a manner directly opposed to those higher in psychopathy (Jones & Paulhus, 2017). Instead, I expect an effect to emerge for Machiavellianism – in the same direction as psychopathy – but only when the contingencies for reward and punishment support selfish or manipulative behavior. Specifically, I argue that those higher in psychopathy myopically focus on reward across situations with little regard for consequences. Those higher in Machiavellianism, however, engage in situationally specific, reward-focused, decision-making due to their caution and flexibility. Thus, the present research addresses how individuals high in these traits make decisions under different reward and punishment contingencies, which will provide a window into when antisocial behavior is likely for those high in Machiavellianism versus those high in psychopathy.

Chapter 2: Study 1 – Passive Avoidance Learning

A well-replicated finding in psychopathy research is that those higher in psychopathy exhibit poor passive avoidance learning on the Go/No-Go task (e.g., Newman & Kosson, 1986). Indeed this effect is well-replicated with at least 22 studies having been conducted examining psychopathic decision-making using this task (Smith & Lilienfeld, 2015). However, it is currently unknown whether those high in Machiavellianism also exhibit poor passive avoidance learning. Therefore, the objective for the present study is to directly test the difference between Machiavellianism and psychopathy insofar as passive avoidance learning. In this study, passive avoidance learning is indexed as the proportion of trials which presented a cue to punishment to which the participant incorrectly responded.

Based on previous research it is unlikely that those higher in Machiavellianism would exhibit poor passive avoidance learning. Specifically, Machiavellianism is theoretically associated with a flexible decision-making style such that those higher in this trait change their behavior to avoid punishments (Bereczkei, 2015). Moreover, Machiavellianism is associated with less risky cheating strategies (Jones & Paulhus, 2017; Williams et al., 2010) and is less related to impulsivity than is psychopathy (e.g., Maesza & Ostaszewski, 2016). Machiavellianism is also unrelated to (Neria et al., 2016; Stenason & Vernon, 2016) or positively correlated with BIS (Jonason & Jackson, 2016), whereas psychopathy is negatively correlated with BIS (Jonason & Jackson, 2016; Neria et al., 2016; Stenason & Vernon, 2016).

The present study, thus examined the relationship of psychopathy and Machiavellianism with passive avoidance learning using the Go/No-Go task. Two hypotheses emerged based on previous research:

H₁: Those higher in psychopathy will exhibit poor passive avoidance learning.

H₂: Those higher in Machiavellianism will not be associated with passive avoidance learning.

METHODS

Power Analysis

A power analysis was conducted using an effect size of $f^2 = 0.06$ to determine the number of participants necessary to have an 80% chance of detecting an effect should one exist in the population. This effect size was determined based on a previous finding that psychopathy had a correlation of 0.24 with Go/No-Go task performance – specifically the number of times participants responded to a cue to punishment – in an undergraduate sample (Lynam, Whiteside & Jones, 1999).⁵ The results of this analysis indicated that a sample size of 183 was necessary. Thus, 254 participants were recruited for this study to account for the potential of participant exclusion based on failures to pass the one of two attention checks included in the self-report measures.

Participants

Two-hundred and fifty-four participants were recruited online from Amazon's Mechanical Turk. However, 49 participants were removed from the final analyses due to their failure of one of two attention checks. Another four participants were also removed from final analyses because they indicated they did not try on the Go/No-Go task. Thus, a final sample of 201 participants were included in the subsequent analyses (58.2% Female; 81.1% White; $M_{age} = 19$, $Max_{age} = 73$, $M_{age} = 39.87$, $SD_{age} = 12.24$).

Previous studies have demonstrated that Amazon's Mechanical Turk provides data that is at least as reliable as data collected using undergraduate samples in addition to providing slightly more demographically heterogeneous samples (Buhrmester, Kwang & Gosling, 2011). Participants were offered \$2.00 in exchange for their participation.

⁵ Unfortunately, a power analysis using an effect size for Machiavellianism is not possible as no study has previously examined attentional deficits related to Machiavellianism.

Measures

In accordance with recommendations by Paulhus and Williams (2002) narcissism was measured in addition to subclinical psychopathy and Machiavellianism. Specifically, Paulhus and Williams (2002) recommend measuring all three traits together due to the high inter-correlation between the three traits. By measuring all three traits, one is able to determine the uniqueness of any relationships found. Additionally, two measures were collected to assess each personality due to conflicting recommendations. Based on findings from their meta-analysis, Vize and colleagues (2016) recommended using the Short Dark Triad (SD3; Jones & Paulhus, 2014) to assess psychopathy, narcissism and Machiavellianism. In contrast, Muris and colleagues (2017) do not recommend using the SD3 as they contend that this short measure does not accurately capture the constructs it purports to measure. Instead, they recommend using the measures traditionally used and developed in each separate field of study to assess these traits (Muris et al., 2017). By including each measure, the pattern of results across measures can be compared. The descriptive statistics of these measures are presented in Table 2.1. Note, the skewness and kurtosis statistics of all measures of the Dark Triad are within acceptable limits traditionally used to assess normality (e.g., Curran, West & Finch, 1996).

Table 2.1: Descriptive Statistics of Dark Triad Measures

	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
SD3-Psychopathy	1.00	4.11	2.00	0.69	0.63	0.09
SD3-Machiavellianism	1.00	5.00	2.79	0.80	0.33	-0.13
SD3-Narcissism	1.00	4.67	2.45	0.76	0.42	0.07
SRP-SF	1.14	4.38	1.75	0.58	1.17	2.08
Mach-IV	1.22	4.58	2.56	0.56	0.46	0.86
NPI-13	1.00	2.00	1.19	0.22	1.38	1.61

Short Dark Triad

The Short Dark Triad (SD3) was used to assess subclinical psychopathy, narcissism, and Machiavellianism (Jones & Paulhus, 2014). This 27-item scale assesses each personality using 9-items: psychopathy (e.g., “I like to get revenge on authorities.”), narcissism (e.g., “People see me as a natural leader.”), and Machiavellianism (e.g., “It’s not wise to tell your secrets.”). Participants rated their agreement with these statements on a 5-point Likert-type scale from 1(*Strongly Disagree*) to 5(*Strongly Agree*).

The 9-items assessing each trait are averaged to create an index of each personality. Higher scores indicate the participant has higher levels of said personality, whereas lower scores indicate lower levels of said personality; no cut-point or diagnostic criteria are used. The SD3 has demonstrated acceptable reliability in previous studies using non-clinical samples (e.g., Vize et al., 2016). Further the SD3 has shown structural equivalence to the original measures in latent variable procedures (Jones & Olderback, 2014). In this sample, all three scales exhibited acceptable reliability: sub-clinical psychopathy ($\alpha = 0.79$), narcissism ($\alpha = 0.85$), and Machiavellianism ($\alpha = 0.87$).

Psychopathy

The Self-Report Psychopathy Short-Form (SRP-SF) was also used to assess subclinical psychopathy (Paulhus, Neumann, & Hare, 2016). This measure has participants rate their agreement with 29-items on a 5-point Likert-type scale from 1(*Strongly Disagree*) to 5(*Strongly Agree*). The SRP-SF assesses four inter-correlated lower-order factors: interpersonal manipulation (e.g., “I would get a kick out of ‘scamming’ someone.”), callous affect (e.g., “Most people are wimps.”), erratic lifestyle (e.g., “I’m a rebellious person.”), and antisocial behavior (e.g., “I have tricked someone into giving me money.”). These four factors then indicate a higher-order factor of psychopathy.

The 29-items of this scale were averaged to create an overall score of psychopathy; higher scores indicate higher levels of psychopathy. As this is a measure of subclinical

psychopathy, participants' scores were examined on a continuum with no cut-off points or diagnostic criteria used. This measure has demonstrated acceptable reliability in non-clinical samples (e.g., Miller et al., 2016). Indeed, this measure exhibited excellent reliability in this sample, as well ($\alpha = 0.93$).

Machiavellianism

The Mach-IV was also used to assess Machiavellianism (Christie & Geis, 1970). For this measure, participants rated their agreement with 20-items on a 5-point Likert-type scale from 1(*Strongly Disagree*) to 5(*Strongly Agree*) (e.g., "It is wise to flatter important people.") Proposed factor structures of the Mach-IV have generally failed to replicate across studies (e.g., Panitz, 1989). As such, most researchers use the Mach-IV as a unitary assessment of Machiavellianism (e.g., Vize et al., 2016).

Machiavellianism scores were computed by averaging responses across the 20-items. Machiavellianism scores were considered to be on a continuum with higher scores representing higher levels of the trait. The Mach-IV has previously demonstrated acceptable reliability in non-clinical samples (e.g., Vize et al., 2016). Similarly, this measure exhibited adequate reliability in this sample ($\alpha = 0.83$).

Narcissism

The Narcissistic Personality Inventory-13 (NPI-13) was also used to assess narcissism (Gentile et al., 2013). The NPI-13 is a shortened version of the original 40-item NPI. A benefit of this measure is that it produces a clear factor structure. Specifically, the NPI-13 assesses three factors of narcissism: leadership/authority (e.g., "I have a strong will to power."), grandiose exhibitionism (e.g., "I like to show off my body."), and entitlement/exploitativeness (e.g., "I expect a great deal from other people.").

This 13-item scale has participants choose which of two statements is closest to their views. One of the two statements represents a narcissistic option, whereas the other statement represents a non-narcissistic option. Narcissistic choices were scored two, whereas non-

narcissistic choices receive a score of one. The 13-items were then averaged to create a score of narcissism. Using the NPI-13, narcissism scores were considered on a continuum with higher scores indicating higher levels of narcissism. This measure has demonstrated acceptable reliability in non-clinical samples (e.g., Miller et al., 2016). The NPI-13 also exhibited acceptable reliability in this sample ($\alpha = 0.82$).

Go/No-Go Task

Passive avoidance learning was assessed using the Go/No-Go task as in Newman and Kosson (1986) and Newman and colleagues (1990). Participants were told that they would be engaging in a task in which they could earn money. Specifically, they were told that a raffle would be conducted to determine 25 participants to receive the money they earned in the task (see Appendix A for the exact instructions presented to participants). Furthermore, they were informed that they would be viewing a series of 10 numbers to which they could respond by pressing a space bar. Half of the numbers served as cues to reward (i.e., winning 10 cents), whereas the other half served as cues to punishment (i.e., losing 10 cents). Participants were not informed which numbers cued reward or punishment before beginning the task. The participants were instructed that their task was to learn which numbers they should respond to and which numbers they should not respond to through trial and error.

The 10 numeric stimuli used in this study were 03, 15, 42, 69, 74, 21, 38, 57, 84, and 96 (Newman et al., 1990). The cues to reward and punishment were counterbalanced so that cues to reward for one half of participants represented cues to punishment for the other half of participants (Newman et al., 1990). Each number was visible until a response was made or three seconds had passed (Newman et al., 1990). Further, these numbers were presented in a pseudo-random order with the only constraint being that no more than three consecutive trials of a cue to punishment or cue to reward were presented (Newman & Kosson, 1986).

Feedback on whether the participant won or lost money on a particular trial was presented after a response. When participants responded – by pressing the space bar – on trials in

which a cue to reward was present, the following phrase appeared above the stimulus (i.e., number) in green lettering for five seconds – or until participants respond by pressing the space bar: “Congratulations! You won 10 cents.” (Newman et al., 1990). However, when participants responded on trials in which the cue to punishment was present, the following phrase appeared above the stimulus (i.e., number) in red lettering for five seconds – or until participants respond by pressing the space bar: “Sorry. You lost 10 cents.” (Newman et al., 1990). Failure to respond did not result in any money lost or earned, the participant was directed to the next trial.

Participants began the task with \$4.50 and completed 90 test trials of this task. Before beginning the test trials, participants completed a five trial pretreatment to establish a dominant response set as in Newman and colleagues (1990). In the pretreatment trials all five cues to reward appeared. The pretreatment trials as well as the first ten trials of the Go/No-Go task were excluded from analyses. The first ten trials were excluded because the purpose of this study is not to determine the time it takes for participants to learn the response contingency (Newman & Schmitt, 1998). The proportion of No-Go trials ($M = 0.36$; $SD = 0.28$; Skewness = 0.83; Kurtosis = -0.14) to which the participant responded during the last 80 trials was recorded.

Procedure

Participants recruited through Amazon’s Mechanical Turk were given a link to follow in order to begin the study. On the first page, participants were provided informed consent. Those indicating agreement with the informed consent document selected the statement “I agree” and were directed to the Go/No-Go task. The Go/No-Go task was hosted through Millisecond’s online *Inquisit* software. On completing the 95 trials of the Go/No-Go task, participants were directed to the *Qualtrics* platform. First, participants were asked if they tried their best on the Go/No-Go task. Those who indicated they did not try their best were removed from analyses. They were informed that their responses to this question would not negatively affect them in any way. Participants then completed the four self-report, Dark Triad measures (i.e., SD3, SRP-SF, Mach-IV, and NPI-13), as well as several demographic questions (i.e., gender, age, and

race/ethnicity). After, completion of these assessments, a debriefing statement (see Appendix B) appeared on the computer screen to explain the purpose of the study and to thank them for taking the time to participate in the study. Finally, participants were provided with a code to enter on Amazon's Mechanical Turk in order to receive payment.

RESULTS

The correlations between all Dark Triad measures were examined and are presented in Table 2.2. As in previous studies, the Dark Triad traits exhibited moderate to strong correlations (e.g., Paulhus & Williams, 2002). Further, the measures independently developed to assess each trait were strongly correlated with the SD3 scales of the Dark Triad (Jones & Paulhus, 2014).

Table 2.2: Correlations between Dark Triad Measures

	1	2	3	4	5	6
1. SD3-Psychopathy	-	0.70	0.47	0.81	0.60	0.49
2. SD3-Machiavellianism	0.70	-	0.48	0.64	0.73	0.43
3. SD3-Narcissism	0.47	0.48	-	0.37	0.36	0.69
4. SRP-SF	0.82	0.65	0.38	-	0.61	0.41
5. Mach-IV	0.60	0.73	0.36	0.63	-	0.43
6. NPI-13	0.49	0.43	0.69	0.41	0.43	-

Note: All measures are significantly correlated at $p < 0.001$.

Two approaches were used to test the two hypotheses for this study. Specifically, these hypotheses were that those higher in psychopathy (H_1) but not those higher in Machiavellianism (H_2) would exhibit poor passive avoidance learning. First, I examined the zero-order and partial correlations between the Dark Triad traits – as indexed by the two different measures – and the proportion of incorrect responses on No-Go trials (Table 2.3). I also, compared these correlations. This approach is in accordance with recommendations from Miller and colleagues (2016) on the best way to test differences in associations among the Dark Triad.

Contrary to my first hypothesis, neither measure of psychopathy was significantly correlated with poor passive avoidance learning. Further, there was not a significant difference between the zero-order correlations of Machiavellianism and psychopathy with the proportion of incorrect responses on No-Go trials when these traits were measured using the SD3 ($t(198) = 0.18, p = 0.86$) or the original measures, $t(198) = 0.63, p = 0.53$. Nevertheless, in support of my second hypothesis Machiavellianism was not correlated with poor passive avoidance learning.

Table 2.3: Zero-Order and Partial Correlations of Dark Triad Traits

	Zero-Order	Partial
<i>Short-Dark Triad</i>		
SD3-Psychopathy	0.10	0.05
SD3-Machiavellianism	0.09	0.03
SD3-Narcissism	0.06	0.01
<i>Original Measures</i>		
SRP-SF	0.02	-0.03
Mach-IV	0.06	0.04
NPI-13	0.07	0.06

Note: None of the zero-order or partial correlations reported above are significant at $p < 0.05$.

In accordance with recommendations by Muris and colleagues (2017) regressions including all three Dark Triad traits on the proportion of incorrect responses on No-Go trials were conducted (Table 2.4). Different regressions were conducted for the traits as indicated by the SD3 and the original measures of these traits.⁶ The results from both regressions failed to support my first hypothesis that psychopathy would be associated with poor passive avoidance learning. However, Machiavellianism was also not associated with poor passive avoidance learning as predicted in my second hypothesis.

⁶ A t -test was conducted to determine the effect of gender on the dependent variable. The results of this analysis indicated that gender did not significantly affect the proportion of incorrect responses participants made on No-Go trials $t(199) = -0.76, p = 0.45$. As such, gender was not included in the main analyses.

Table 2.4: Regressions of Dark Triad Traits

	β	SE	p-value
<i>Short-Dark Triad</i>			
SD3-Psychopathy	0.06	0.07	0.38
SD3-Machiavellianism	0.04	0.06	0.56
SD3-Narcissism	-0.01	0.05	0.78
<i>Original Measures</i>			
SRP-SF	-0.02	0.05	0.66
Mach-IV	0.03	0.05	0.52
NPI-13	0.08	0.09	0.39

Together, these findings support my second hypothesis that Machiavellianism would be unrelated to passive avoidance learning. However, the results do not support my first hypothesis that psychopathy would be related to passive avoidance learning.

Exploratory Analyses

Several exploratory analyses were conducted to investigate the relationship between psychopathy and passive avoidance learning in this study. Specifically, numerous previous studies have replicated the association between psychopathy and passive avoidance learning (Baskin-Sommers & Newman, 2013). Indeed, a recent meta-analysis found an association of 0.22 for the relationship of psychopathy with passive avoidance learning (Newman & Baskin-Sommers, 2016). However, a closer examination of the literature suggests that sample characteristics, specifically gender, may have affected this relationship.

A series of regressions were conducted to assess the possibility that gender significantly affected the relationship between psychopathy and poor passive avoidance learning. Particularly, two regressions including psychopathy, gender, and an interaction between psychopathy and gender on passive avoidance learning were conducted (Table 2.5). Results indicated a marginally

significant interaction between psychopathy and gender only when the SRP-SF was used to assess psychopathy.

Table 2.5: Regressions with Psychopathy, Gender, and Psychopathy and Gender Interaction

	β	SE	p-value
<i>Short-Dark Triad</i>			
SD3-Psychopathy	0.03	0.04	0.52
Gender	-0.18	0.13	0.17
SD3-Psychopathy * Gender	0.06	0.06	0.33
<i>Original Measures</i>			
SRP-SF	-0.04	0.05	0.45
Gender	-0.29	0.14	0.04
SRP-SF * Gender	0.14	0.07	0.06

The interaction between SRP-SF psychopathy and gender was probed using simple-slopes analysis (Figure 2.1). Consistent with previous studies that found a significant psychopathy and gender interaction, the relationship between psychopathy and poor passive avoidance learning was marginally significant only for male – not female – participants. Specifically, male participants that scored higher on the SRP-SF committed more passive avoidance errors (i.e., responded to more No-Go stimuli) than did those with lower scores on this measure, $\beta = 0.10$, $p = 0.06$. There was not, however, an effect of SRP-SF scores on passive avoidance errors among female participants, $\beta = -0.04$, $p = 0.44$.

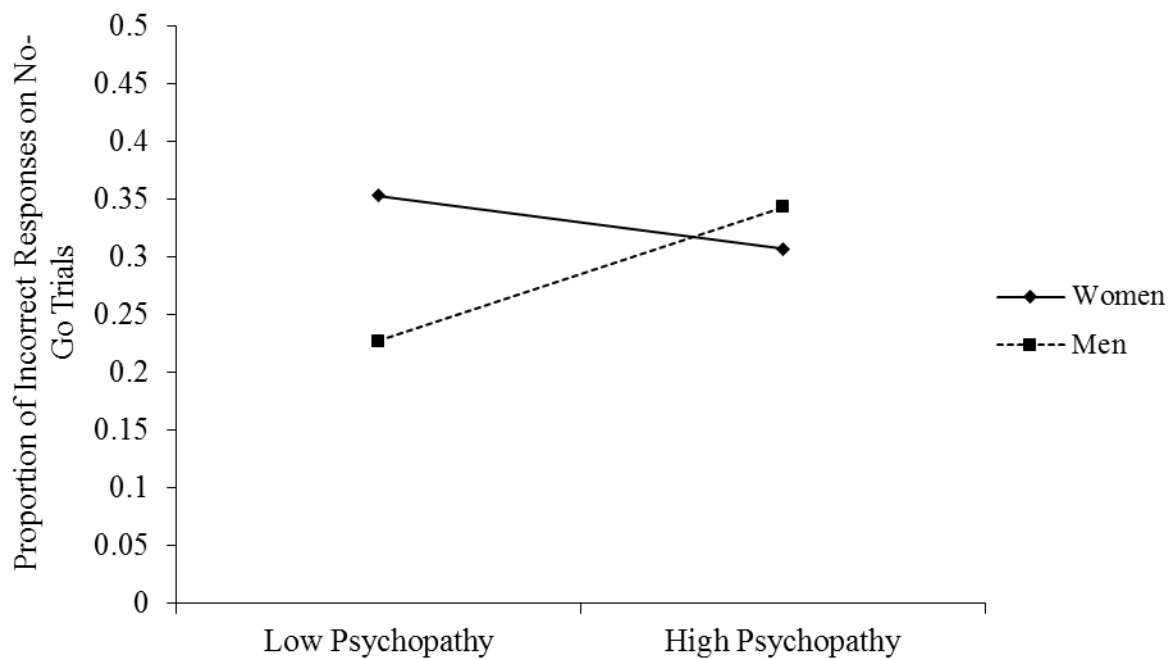


Figure 2.1: Interaction between SRP-SF and Gender on Proportion of Incorrect Responses on No-Go Trials

As the purpose of this study was to differentiate psychopathy and Machiavellianism, I also conducted two regressions to test whether Machiavellianism also interacted with gender as did SRP-SF psychopathy. The results of these regressions indicated that there was not a significant interaction between Machiavellianism and gender on passive avoidance learning (Table 2.7).

Table 2.6: Regressions with Machiavellianism, Gender, and Machiavellianism by Gender Interaction

	β	SE	p-value
<i>Short-Dark Triad</i>			
SD3-Machiavellianism	0.02	0.03	0.61
Gender	-0.21	0.15	0.18
SD3-Machiavellianism * Gender	0.06	0.05	0.27
<i>Original Measures</i>			
Mach-IV	0.01	0.05	0.77
Gender	-0.17	0.19	0.38
Mach-IV * Gender	0.05	0.07	0.49

The interaction between the Dark Triad traits and age were also estimated as previous studies have found the effect of psychopathy on recidivism varies across age (Porter, Birt, & Boer, 2001). None of these analyses suggested a significant Dark Triad by age interaction, p 's > 0.05.

DISCUSSION

Previous research has called into question whether psychopathy and Machiavellianism are distinct constructs (Vize et al., 2016). In the psychopathy literature, a well-replicated finding is that those higher in psychopathy exhibit poor passive avoidance learning (Smith & Lilienfeld, 2015). Often, this has been demonstrated using the Go/No-Go task (e.g., Newman et al., 1990). Thus, the purpose of the present study was to examine the differences in the effects of Machiavellianism and psychopathy on passive avoidance learning using the Go/No-Go task. The results of this study supported the hypothesis that there would not be an effect of Machiavellianism on passive avoidance learning (H_2). However, the hypothesis that those higher in psychopathy would exhibit poor passive avoidance learning (H_1) was not supported.

The failure to support this hypothesis contradicts most of the previous research that has demonstrated a significant effect of psychopathy on passive avoidance learning (e.g., Smith & Lilienfeld, 2015). A potential explanation of the lack of a relationship between psychopathy and passive avoidance learning in this study is that this relationship depends upon gender (e.g., Vitale et al., 2007). This possibility was tested in additional, exploratory analyses. The results of these exploratory analyses tentatively supported a psychopathy and gender interaction on passive avoidance learning. Specifically, there was a marginally significant interaction between these variables such that males higher in psychopathy as measured using the SRP-SF committed more passive avoidance errors. Generally, this interaction tends to support that the lack of a significant main-effect of psychopathy on passive avoidance learning was due to gender effects. Nevertheless, the interaction between psychopathy and gender was only significant when psychopathy was measured using the SRP-SF. These discrepancies in findings suggests either that the psychopathy and gender interaction was spurious or there are characteristics of these scales that resulted in these discrepant findings.

Because the purpose of this study was to differentiate Machiavellianism and psychopathy, the interaction between Machiavellianism and gender on passive avoidance learning was also calculated. In contrast to psychopathy, there was no significant interaction between Machiavellianism and gender. This finding provides some evidence for the distinction between psychopathy and Machiavellianism. Overall, however, the planned analyses provided minimal support for this distinction. Although Machiavellianism and psychopathy did record differential correlations, the finding that psychopathy was not associated with poor passive avoidance learning contrasts with previous psychopathy findings. Further still, the exploratory analyses provide some limited support for their distinction insofar as males higher in psychopathy exhibit poor passive avoidance learning whereas there is no effect of Machiavellianism on passive avoidance learning. Nevertheless, it is important to remember that these analyses were not planned and therefore require a planned replication. Furthermore, one

cannot prove a null hypothesis and therefore the interpretation of the null finding regarding Machiavellianism should be reserved.

Although this study focused on examining the distinction between Machiavellianism and psychopathy insofar as a well-replicated finding in the psychopathy literature. This study did not, however, examine the differences between these personality traits in terms of the aspects of Machiavellianism that are theoretically distinct from psychopathy. Thus, a second study was conducted to specifically test the theoretical distinction of Machiavellianism from psychopathy.

Chapter 3: Study 2 – Behavioral Flexibility

A flexible decision-making style has been proposed as a defining feature of Machiavellianism (Bereczkei, 2015). Specifically, those higher in Machiavellianism alter their decisions to avoid punishment (e.g., Bereczkei et al., 2010). In particular, studies have shown that those higher in Machiavellianism are sensitive to monetary (e.g., Spitzer et al., 2007) and reputational (Bereczkei et al., 2010) consequences. This change in behavior due to changes in punishment contingencies is referred to as behavioral flexibility. It is, however, currently unknown whether those high in psychopathy also exhibit a flexible decision-making style. Based on previous research, however, it is unlikely that those higher in psychopathy will change their behavior based on cues to punishment. For example, individuals with higher psychopathy scores tend to be less sensitive to punishment than those with lower scores as indexed by the negative association between psychopathy and BIS (Jonason & Jackson, 2016; Neria et al., 2016; Stenason & Vernon, 2016). In contrast, Machiavellianism is either unrelated to (Neria et al., 2016; Stenason & Vernon, 2016) or positively associated with BIS (Jonason & Jackson, 2016). Furthermore, psychopathy is more clearly associated with impulsivity than is Machiavellianism (e.g., Maesza & Ostaszewski, 2016).

Additionally, the cause of the relationship between Machiavellianism and reputational concerns is unknown. In a previous study, those higher in Machiavellianism demonstrated behavioral flexibility (i.e., they changed their decisions – based on varying cues to reputational punishment (Bereczkei et al., 2010). Specifically, when reputational punishment was possible there was no effect of Machiavellianism. However, when reputational punishment was not possible, those higher in Machiavellianism behaved more selfishly. The concern of those high in Machiavellianism to maintain a positive reputation is unlikely to be due to concern for developing close interpersonal bonds. Generally, those higher in Machiavellianism are described as more distant from others and eschew emotional commitments (Christie & Geis, 1970). As an example, those higher in Machiavellianism prefer to have a purely transactional relationship with

their employer (Zagenczyk, Restubog, Kiewitz, Kiazad & Tang, 2014). The goals of those higher in Machiavellianism are also more agentic focused (i.e., getting ahead) rather than communal focused (i.e., getting along; Rauthmann & Kolar, 2013). This greater focus on agency rather than communion means that those higher in Machiavellianism tend to place greater emphasis on getting ahead in terms of power, dominance, and status rather than getting along with others to promote interpersonal connections (Rauthmann & Kolar, 2013).

Consistent with Machiavellians' greater focus on individualized agentic success compared to communal and interpersonal success, those higher in Machiavellianism rate friendship as being less important (Lyons & Aitken, 2010). Moreover, Machiavellianism is associated with avoidant-attachment styles in interpersonal relationships (Inancsi, Lang & Bereczkei, 2015). Overall then, those higher in Machiavellianism view close relationships with others as less important than those lower in this trait. The concerns that those high in Machiavellianism have over reputation most likely stems from concerns with maintaining relationships that may be useful for future achievement of agentic goals. Indeed, those higher in this trait are likely sensitive to any punishment that could affect their achievement of an agentic goal (e.g., money or power). This interpretation has not, however, been empirically tested.

The first objective of this study is to directly test the difference between Machiavellianism and psychopathy insofar as decision-making flexibility. Specifically, participants' will complete a one-shot prisoner's dilemma game under two conditions. In the first condition, participants will play the game with their friend and in the second condition the participant will play the game with a stranger. In this game, non-cooperative behavior produces the greatest possible reward and is also the safest strategic decision (Kollock, 1998). Thus, those concerned mostly with self-relevant outcomes – such as those high in psychopathy and Machiavellianism – should choose the non-cooperative option when playing this game. However, in a previous study using the prisoner's dilemma, participants concerned with other's impressions of themselves used cooperative behavior as an impression management technique (Danheiser & Graziano, 1982). As such, individuals concerned with their reputation – such as

those higher in Machiavellianism – should choose the cooperative option when playing this game with a friend. Thus, two hypotheses emerge regarding the behavior of those higher in psychopathy and Machiavellianism in the prisoner's dilemma game:

H₁: Those higher in Machiavellianism will choose the non-cooperative option in the stranger condition only.

H₂: Those higher in psychopathy will choose the non-cooperative option in the stranger condition and friend condition.

The second objective for this study is to elucidate the reason those higher in Machiavellianism are concerned with their reputation. The most likely possibility based on previous research is that those higher in this trait are concerned with maintaining relationships with individuals who may be useful for their own future agentic success. Thus, a third hypothesis was examined in this study:

H₃: Those higher in Machiavellianism will change their behavior in the two conditions due to the greater perceived value of their friend for the participants' future agentic success.

METHODS

Participants

Seventy-nine students at the University of Texas at El Paso were recruited to participate in this study using the SONA participant sign-up system. Students were offered course credit in exchange for participation. Participants were told that they must bring a non-related, non-romantic friend with them to participate in this study. Further, the participant was told that both they and their friend must meet the following recruitment criteria: (1) must be over the age of 18, (2) must identify as the same gender⁷ and (3) must not have previously participated in the study. The participant and friend had the opportunity to earn money in the experimental manipulation; the friend was not be compensated in any other way.

⁷ Gender of participants was not further restricted as previous findings have shown that although women tend to have lower scores in Machiavellianism than do men, the direction of the association with relevant outcomes tends to be the same (Jonason, Li & Webster, 2009).

The friend and participant completed the same experimental procedure in separate rooms and are therefore both analyzed participants. As such, the recruitment of 79 participant-friend pairs resulted in a total of 158 participants. However, six participants were removed from the final data set because they indicated they did not consider themselves fluent in English. Furthermore, four participants were removed from the final data set because they failed at least one of two attention checks. This resulted in a final sample of 148 participants (73.6% Female;⁸ 90.5% Hispanic; $Min_{age} = 18$, $Max_{age} = 60$, $M_{age} = 20.35$, $SD_{age} = 4.18$).

Measures

In keeping with the recommendations of Muris and colleagues (2017) the original measures of the Dark Triad were again used. Furthermore, in keeping with the recommendations by Vize and colleagues (2016) the Short-Dark Triad was again used to assess these personality traits. The descriptive statistics of the Dark Triad self-report measures are presented in Table 3.1. Note that the skewness and kurtosis statistics are within traditional bounds determined to represent normality.

Table 3.1: Descriptive Statistics of Dark Triad Measures

	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
SD3-Psychopathy	1.00	3.44	2.10	0.56	0.21	-0.44
SD3-Machiavellianism	1.44	4.44	2.93	0.61	-0.85	-0.40
SD3-Narcissism	1.44	4.78	2.84	0.68	0.64	0.76
SRP-SF	1.14	3.34	1.88	0.51	0.41	-0.34
Mach-IV	1.63	3.53	2.61	0.44	0.05	-0.51
NPI-13	1.00	1.92	1.28	0.23	0.71	-0.34

⁸ The effect of participant's gender on their decisions in the prisoner's dilemma tasks was estimated using a multiway contingency tables analysis. The results indicated there was not a significant effect of gender on participants' decisions to defect or cooperate, $G^2(1) = 1.223$, $p > 0.05$.

Psychopathy

As in study one, the Self-Report Psychopathy Short-Form (SRP-SF) (Paulhus, Neumann & Hare, 2016) and the psychopathy scale of the Short Dark Triad (SD3) (Jones & Paulhus, 2014) were used to measure psychopathy. Both the SRP-SF ($\alpha = 0.89$) and SD3 psychopathy ($\alpha = 0.69$) measures demonstrated adequate reliability.

Machiavellianism

The Mach-IV (Christie & Geis, 1970) and the Machiavellianism scale of the SD3 (Jones & Paulhus, 2014) were used to assess Machiavellianism as in study one. In this sample, both the Mach-IV ($\alpha = 0.73$) and Machiavellianism scale of the SD3 ($\alpha = 0.73$) demonstrated acceptable reliability.

Narcissism

Again, as in study one, the 13-item Narcissistic Personality Inventory (NPI-13) (Gentile et al., 2013) and the narcissism scale of the SD3 (Jones & Paulhus, 2014) were used to assess narcissism. The NPI-13 ($\alpha = 0.77$) and narcissism scale of the SD3 ($\alpha = 0.81$) both exhibited acceptable levels of reliability.

Perceived Value

Two questions were created for this study to assess participants' perceived value of their game partners, for the participants' agentic success. Specifically, participants were asked to rate the following two questions on a 5-point Likert-type scale from 1(*Not at All Important*) to 5(*Extremely Important*): "How valuable do you think [*your friend / the next participant*] is to your future success?" and "How valuable do you think [*your friend / the next participant*] is to your current success?" There was a high correlation between participants' ratings of their friends' valuableness to their current and future success ($r = 0.75$) so these ratings were averaged for all analyses. Similarly, there was a moderate to high correlation between participants' ratings of the valuableness of the stranger with whom they participated to their current and future success ($r = 0.66$) so these ratings were also averaged for subsequent analyses. Overall,

participants rated their friend ($M = 3.59$; $SD = 0.95$; $Min = 1$; $Max = 5$; $Skewness = -0.49$; $Kurtosis = -0.13$) as being significantly more important to their success than the stranger ($M = 1.95$; $SD = 1.04$; $Min = 1$; $Max = 5$; $Skewness = 1.01$; $Kurtosis = 0.46$) with whom they participated, $t(147) = 20.65$, $p < 0.001$.

Interpersonal Closeness

Participants completed the Inclusion of Others in Self Scale (IOSS) to control for the possibility that those higher in Machiavellianism behaved differently when their friend was their partner due to a communal concern for their relationship (Aron, Aron & Smollan, 1992). The IOSS assesses how close individuals' feel to another person (Aron, Aron & Smollan, 1992). This single-item, pictorial scale includes seven Venn-diagrams with increasing levels of overlap. One of the circles of the Venn-diagram represents the self, whereas the other circle represents the other person. Participants choose which Venn-diagram best reflects their relationship with the other person. Choosing a diagram with a greater degree of overlap indicates greater perceived closeness, whereas choosing a diagram with lesser or no overlap indicates less perceived closeness. This measure has demonstrated adequate test-retest reliability, as well as positive associations with other measures of relationship closeness and quality (Aron et al., 1992). Participants completed this measure for their friend ($M = 4.81$; $SD = 1.67$; $Min = 1$; $Max = 7$; $Skewness = -0.48$; $Kurtosis = -0.68$) and the stranger with whom they played ($M = 1.39$; $SD = 0.93$; $Min = 1$; $Max = 6$; $Skewness = 2.81$; $Kurtosis = 7.83$). Participants reported significantly greater self-other overlap between themselves and their friend than between themselves and the stranger with whom they played, $t(146) = 24.03$, $p < 0.001$.

Trust

Participants completed a single-item question created for this study to assess their trust that their partner would behave in a cooperative manner. This was done to control for the possibility that participants higher in Machiavellianism behave in a cooperative manner due to their belief that their partner will reciprocate such actions. Specifically, participants rated the

following question on a 7-point Likert-type scale from 1(*Extremely Likely*) to 7(*Extremely Unlikely*): “How likely do you think it is that [*your friend / the next participant*] sent you \$1.00?” Participants reported significantly greater trust that their friend ($M = 2.05$; $SD = 1.19$; $Min = 1$; $Max = 7$; $Skewness = 1.86$; $Kurtosis = 4.38$) behaved cooperatively (i.e., sent them the dollar) than did the stranger ($M = 4.29$; $SD = 1.63$; $Min = 1$; $Max = 7$; $Skewness = -0.07$; $Kurtosis = -0.75$), $t(147) = -14.83$, $p < 0.001$.

Prisoner’s Dilemma Game

The prisoner’s dilemma game is a two-person version of the multi-player public goods game (Kollock, 1998). In the prisoner’s dilemma game, participants may choose between two strategies: cooperation or defection. In this study, participants were given \$1.00 and an envelope (Kollock, 1998). Participants chose to keep the dollar for themselves or put the dollar in the envelope to send to their partner in the game (Kollock, 1998). If participants chose to send the dollar to their partner, the dollar was doubled by the researcher (Kollock, 1998). Cooperation in this game involves participants’ sending the dollar to their partner, whereas defection involves keeping the dollar for themselves. The contingencies for this game are illustrated in Table 3.2.

Table 3.2. Potential Outcomes of Prisoner’s Dilemma Game

		Partner Choice	
		Cooperation	Defection
Participant Choice	Cooperation	Participant: \$2.00 Partner: \$2.00	Participant: \$0.00 Partner: \$3.00
	Defection	Participant: \$3.00 Partner: \$0.00	Participant: \$1.00 Partner: \$1.00

The best outcome for the participant (i.e., participant ends game with \$3.00) in this game is obtained when the participant chooses to defect while their partner chooses to cooperate (DC).

The next best outcome for the participant (i.e., participant ends game with \$2.00) is obtained when both parties choose to cooperate (CC). The third best outcome for the participant (i.e., participant ends game with \$1.00) is then obtained when both parties choose to defect (DD). Finally, the worst outcome for the participant (i.e., participant ends game with no money) is obtained when the participant chooses to cooperate, but their partner chooses to defect (CD). Thus, the following statement is true: $DC > CC > DD > DC$ (Kollock, 1998).

Procedure

Once the participant and their friend arrived at the laboratory, they were be directed to separate experimental rooms. A white-noise machine was turned on in each of the rooms so as to ensure participants could not hear each-other. Both the participant and friend complete the same series of activities described below. As such, both the participant and friend will be referred to as participants from this point onward.

First, informed consent was obtained. The researcher emphasized that the participant could withdraw from the study at any time without penalty. After obtaining consent, the researcher informed the participant that they would play a game with the opportunity to earn real money. This game is the prisoner's dilemma game described above. The researcher provided the participant with the instructions for the prisoner's dilemma game (see Appendix C) and reviewed these procedures with the participant. Additionally, the researcher asked four questions about these instructions to ensure the participant understood the procedures of the game and the associated contingencies. The researcher recorded whether each question was answered correctly or incorrectly. If the participant answered a question incorrectly, the researcher informed the participant that their response was incorrect and provided the correct answer. On average, participants answered three questions correctly ($M = 3.64$; $SD = 0.74$). Indeed, only nine participants answered fewer than three questions correctly.⁹

⁹ The number of questions participants answered correctly was not included as an independent variable due to the lack of variability.

In order to test behavioral flexibility, participants completed this game under two conditions. In the one condition, the participant's partner was the friend with whom they came to participate in the study. In this condition, participants had to choose whether to cooperate and send their dollar to their friend ($n = 138$ or 93.2%) or defect and keep their dollar ($n = 10$ or 6.8%). In the other condition, the participant's partner was a previous participant who completed the study (i.e., a stranger). Again, participants in this condition had to choose whether to cooperate and send their dollar to the previous participant ($n = 113$ or 76.4%) or defect and keep their dollar ($n = 35$ or 23.4%). The order of these conditions was randomized.¹⁰ Participants were informed of their partners' identity (i.e., friend or previous participant) immediately before completing each condition.¹¹ The researcher emphasized that the participant would not meet the previous participant (i.e., stranger) at any point during the study, nor would their identity be revealed to this other participant at any time.

Once the participant completed the prisoner's dilemma game under the two conditions, they completed the self-report personality measures (i.e., SRP-SF, Mach-IV, NPI-13 and SD3), measure of perceived value, IOSS, measure of trust and demographics (i.e., gender, age, race/ethnicity, and length of friendship). The participant was also asked whether they knew either of the participants in the prior study session. Ten participants reported knowing the participant in the prior study session. However, further investigation revealed that the participants were referring to the friend with whom they came to the session and not a previous participant. Thus, none of these participants were excluded from subsequent data analysis. These measures were collected on a computer in the experimental room, using the *Qualtrics* platform.

On completing these measures, the researcher read a paragraph debriefing statement (see Appendix D) to explain the purpose of the study to participants. Additionally, the researcher

¹⁰ The impact of the order of conditions was assessed using a multiway contingency tables analysis. The results of this analysis indicated that there was not a significant effect of order of conditions on participants' choices in the prisoner's dilemma task, $G^2(1) = 1.89, p < 0.05$

¹¹ The main effect of condition on participants' choices in the prisoner's dilemma task was examined using a multiway contingency tables analysis. Results indicated that participants chose to cooperate significantly more often in the friend condition ($n = 138$) than in the stranger condition ($n = 113$), $G^2(1) = 17.31, p > 0.05$.

asked the participant to avoid discussing the specifics of this study with anyone else so that future participants' choices would remain unbiased. Previous research has indicated that this is an effective way to eliminate participant crosstalk (Edlund, Sagarin, Skowronski, Johnson & Kutter, 2009). Finally, the researcher gave the participant their earnings from the two rounds of the game and provided a receipt for their earnings (see Appendix E for script of researcher/participant interaction).

RESULTS

The associations between Dark Triad trait measures was assessed using zero-order correlations (Table 3.3). The SD3 and the original Dark Triad measures to create each trait were strongly correlated. Additionally, the correlations between Dark Triad traits ranged from moderate to strong, as in previous studies (e.g., Paulhus & Williams, 2002).

Table 3.3: Correlations between Dark Triad Measures

	1	2	3	4	5	6
1. SD3-Psychopathy	-	0.62	0.32	0.77	0.62	0.36
2. SD3-Machiavellianism	0.62	-	0.48	0.67	0.66	0.51
3. SD3-Narcissism	0.32	0.48	-	0.31	0.28	0.74
4. SRP-SF	0.77	0.67	0.31	-	0.63	0.31
5. Mach-IV	0.62	0.66	0.28	0.63	-	0.35
6. NPI-13	0.36	0.51	0.74	0.31	0.35	-

Note: All measures are significantly correlated at $p < 0.001$.

The first two hypotheses were tested in three ways. Recall that the first hypothesis was that those higher in Machiavellianism would choose the non-cooperative option (i.e., they would defect or keep their dollar) only in the stranger condition. The second hypothesis was that those higher in psychopathy would choose the non-cooperative option in both conditions. First, the

point-biserial¹² and partial correlations between Dark Triad traits and participant's choice to defect or cooperate were calculated and compared as recommended by Miller and colleagues (2016). Further, as recommended by Lynam, Hoyle, and Newman (2006), separate regressions were conducted for each of the Dark Triad traits on participants' behavior during the prisoner's dilemma task. Regressions including all three Dark Triad traits were also conducted to determine the unique association of each trait as suggested by Muris and colleagues (2017). For all analyses, participants choices were coded such that a value of one indicated the participant chose to cooperate, whereas defection was indicated with a value of zero.

The results of the point-biserial and partial correlations between Machiavellianism and participants' behavior in the prisoner's dilemma task did not support the first hypothesis. Specifically, there was no significant zero-order or partial correlation between Machiavellianism and behavior in the stranger condition (Table 3.4). The second hypothesis was also not supported. Specifically, there was no significant point-biserial or partial correlation between psychopathy and behavior in either the friend or stranger condition. Furthermore, statistical comparison of the point-biserial correlations indicated that there was not a significant difference between the relationships of psychopathy and Machiavellianism with the dependent variable in the friend condition when these traits were assessed using the SD3 ($t(145) = -0.14, p = 0.88$) or when they were measured using the original measures, $t(145) = 0.70, p = 0.48$. Further, there was also no difference between the zero-order correlations of psychopathy and Machiavellianism in the stranger condition when these traits were measured using the SD3 ($t(145) = 0.18, p = 0.86$) or original measures, $t(145) = 1.67, p = 0.10$.

¹² The point-biserial correlation is a special instance of the Pearson's product moment correlation in which there is a continuous predictor variable and a dichotomous outcome variable (Cohen, Cohen, West & Aiken, 2003).

Table 3.4: Zero-Order and Partial Correlations of Dark Triad Traits

	Friend Condition		Stranger Condition	
	Point-Biserial	Partial	Point-Biserial	Partial
<i>Short-Dark Triad</i>				
SD3-Psychopathy	-0.05	-0.04	0.08	0.12
SD3-Machiavellianism	-0.04	0.01	-0.04	-0.11
SD3-Narcissism	-0.06	-0.05	0.01	0.02
<i>Original Measures</i>				
SRP-SF	0.04	0.06	0.09	0.14
Mach-IV	-0.01	-0.05	-0.02	-0.09
NPI-13	0.01	0.01	-0.03	-0.04

Note: None of the zero-order or partial correlations reported above are significant at $p < 0.05$.

Given the categorical nature of the dependent variable, binary-logistic regressions were conducted for all regression-based analyses. Further, as all participants completed both conditions, a multi-level modeling approach was employed to analyze these data. Specifically, person level variables (i.e., participants' scores on measures of the Dark Triad) were included in the model at level two. All Dark Triad scores were grand mean centered in accordance with recommendations by Enders and Tofighi (2007). The within-subjects variable condition was included in the model at level one. Condition was dummy-coded such that the friend condition was coded as one and the stranger condition was coded as zero. Cross-level interactions between participants' Dark Triad traits and condition were also estimated to test whether the effect of Dark Triad traits varied across conditions.

In the first series of regressions presented in tables below, I examined the effects of the Dark Triad traits in separate regressions. Contrary to the first hypothesis, there was no significant interaction between Machiavellianism and condition when Machiavellianism was measured using the SD3 (Table 3.4) or the Mach-IV (Table 3.5). This finding indicates that, contrary to

expectations, the effect of Machiavellianism did not vary across conditions. Indeed there was no significant effect of Machiavellianism in either condition and there was also no main effect of Machiavellianism (Table 3.4; Table 3.5). Furthermore, the second hypothesis was also not supported. Specifically, there was no significant main effect of psychopathy on participants' choice to cooperate or defect in the prisoner's dilemma game (Table 3.4; Table 3.5). Together, these results suggest that there was not a significant effect of any Dark Triad trait on participants' choices in either condition.

Table 3.5: Multi-level Model of Each Dark Triad Trait (Measured Using SD3) Separately

	β	SE	p-value
<i>Within-Level Variable</i>			
Condition	1.82	31.83	0.96
<i>Between-Level Variable</i>			
SD3-Psychopathy	0.39	0.68	0.57
<i>Cross-Level Interaction</i>			
SD3-Psychopathy * Condition	-0.80	3.66	0.83
<i>Within-Level Variable</i>			
Condition	1.70	0.44	< 0.01
<i>Between-Level Variable</i>			
SD3-Machiavellianism	-0.16	0.34	0.63
<i>Cross-Level Interaction</i>			
SD3-Machiavellianism * Condition	-0.11	0.63	0.86
<i>Within-Level Variable</i>			
Condition	1.82	0.45	< 0.01
<i>Between-Level Variable</i>			
SD3-Narcissism	0.03	0.33	0.92
<i>Cross-Level Interaction</i>			
SD3-Narcissism * Condition	-0.43	0.40	0.29

Note: A MLF estimator was used to conduct the regression for SD3-Psychopathy as estimation using a ML estimator resulted in a saddle point.

Table 3.6: Multi-level Model of Each Dark Triad Trait (Measured Using Original Measures) Separately

	β	SE	p-value
<i>Within-Level Variable</i>			
Condition	1.79	0.75	0.02
<i>Between-Level Variable</i>			
SRP-SF	0.52	0.44	0.24
<i>Cross-Level Interaction</i>			
SRP-SF * Condition	-0.11	0.77	0.88
<i>Within-Level Variable</i>			
Condition	1.79	158.70	0.99
<i>Between-Level Variable</i>			
Mach-IV	-0.10	0.84	0.91
<i>Cross-Level Interaction</i>			
Mach-IV * Condition	-0.06	5.35	0.99
<i>Within-Level Variable</i>			
Condition	2.84	2.60	0.28
<i>Between-Level Variable</i>			
NPI-13	-0.37	0.98	0.71
<i>Cross-Level Interaction</i>			
NPI-13 * Condition	0.67	1.61	0.68

Note: A MLF estimator was used to conduct the regression for Mach-IV as estimation using a ML estimator resulted in a saddle point.

I next examined the unique associations of each Dark Triad trait by including all three traits in the same regression. Again, hypothesis one was not supported as there was no significant interaction of SD3 assessed Machiavellianism (Table 3.6) or Mach-IV assessed

Machiavellianism with condition (Table 3.7). Hypothesis two was also not supported by these results. Specifically, there was no main effect of psychopathy on participants' behavior when psychopathy was assessed using the SD3 (Table 3.6). Further, there was a marginally significant main effect of psychopathy when measured using the SRP-SF, but in the opposite direction of the expected effect (Table 3.7). Expressly, those with higher SRP-SF psychopathy scores were marginally, significantly more likely to cooperate across conditions than those with lower scores. Thus, these results also support that those higher in Dark Triad traits did not defect significantly more often than those lower in these traits in the prisoner's dilemma task.

Table 3.7: Multi-level Model of All Dark Triad Traits (Measured Using SD3)

	β	SE	p-value
<i>Within-Level Variables</i>			
Condition	1.81	0.59	< 0.01
<i>Between-Level Variables</i>			
SD3-Psychopathy	0.80	0.55	0.15
SD3-Machiavellianism	-0.67	0.51	0.19
SD3-Narcissism	0.10	0.37	0.78
<i>Cross-Level Interactions</i>			
SD3-Psychopathy * Condition	-1.13	0.81	0.16
SD3-Machiavellianism * Condition	0.80	0.88	0.37
SD3-Narcissism * Condition	-0.44	0.56	0.43

Table 3.8: Multi-level Model of All Dark Triad Traits (Measured Using Original Measures)

	β	SE	p-value
<i>Within-Level Variables</i>			
Condition	3.15	2.64	0.23
<i>Between-Level Variables</i>			
SRP-SF	1.03	0.59	0.08
Mach-IV	-0.74	0.67	0.27
NPI-13	-0.60	1.05	0.57
<i>Cross-Level Interactions</i>			
SRP-SF * Condition	-0.31	1.11	0.78
Mach-IV * Condition	0.04	1.22	0.97
NPI-13 * Condition	0.87	1.69	0.61

The third hypothesis was that those higher in Machiavellianism would change their behavior across conditions due to a greater perceived value of their friend for their own agentic success. However, there were no significant interactions between Machiavellianism and condition on participants' behavior in the prisoner's dilemma tasks. These findings indicated that the assumption in the third hypothesis, specifically that those higher in Machiavellianism would change their behavior across conditions, was not supported. Nevertheless, multilevel models including perceived value, Machiavellianism and the interaction between these two variables were conducted to determine the accuracy of the second part of this hypothesis (i.e., that those higher in Machiavellianism would change their behavior based on their perception of their partner's value).

Results of these analyses partially supported that the decisions made by those higher in Machiavellianism were affected by perceived value. Specifically, the interaction between Machiavellianism – as measured by the SD3 – and perceived value was marginally significant (Table 3.9). A plot of this interaction revealed a trend such that those higher in Machiavellianism

were more likely to cooperate when they perceived their partner as valuable to their future success, but less likely to cooperate when they perceived their partner as not valuable to their future success (Figure 3.1). However, simple-slopes analyses indicated that these effects were not significant: $\beta_{\text{High Value}} = 0.48$, $p = 0.16$ and $\beta_{\text{Low Value}} = -0.44$, $p = 0.26$. Furthermore, the interaction between Mach-IV assessed Machiavellianism and perceived value was not significant.

Table 3.9: Multi-level Models of Machiavellianism and Perceived Value

	β	SE	p-value
<i>Within-Level Variable</i>			
Perceived Value	0.42	0.16	< 0.01
<i>Between-Level Variable</i>			
SD3-Machiavellianism	-0.96	0.63	0.13
<i>Cross-Level Interactions</i>			
SD3-Machiavellianism * Perceived Value	0.36	0.19	0.07
<i>Within-Level Variable</i>			
Perceived Value	1.79	158.70	0.99
<i>Between-Level Variable</i>			
Mach-IV	-0.10	0.84	0.91
<i>Cross-Level Interactions</i>			
Mach-IV * Perceived Value	1.79	5.352	0.99

Note: A MLF estimator was used to conduct the regression for Mach-IV and perceived value as estimation using a ML estimator resulted in a saddle point.

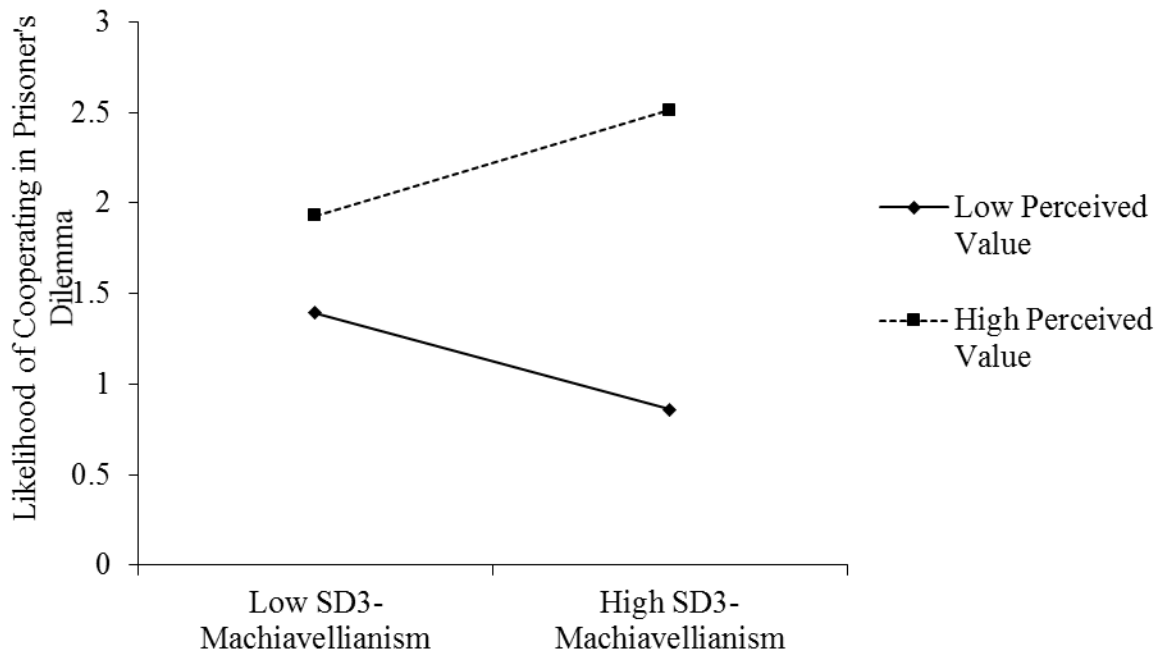


Figure 3.1: Interaction between Machiavellianism (Measured Using SD3) and Perceived Value

To determine whether the interaction between SD3 assessed Machiavellianism and perceived value was unique to participant's perception of their partner's value – and did not represent their closeness with or trust in their partner – several multilevel models were conducted. These models included trust, closeness, value, and Machiavellianism. First, separate multilevel models were conducted including interpersonal closeness – as measured using the IOSS – at level one, Machiavellianism (measured using the SD3 or Mach-IV) at level two and the cross-level interaction between these variables. The interaction between Machiavellianism and IOSS was not significant in either the model, p 's > 0.05 . Next, two models including participants' trust that their partner would cooperate were conducted. The interaction between Machiavellianism and trust was not significant for either measure of Machiavellianism, p 's > 0.05 .

Finally, as the objective of this paper is to examine the distinction between Machiavellianism and psychopathy, the interaction between psychopathy and perceived value on participants' decisions to cooperate or defect were also examined. Again, a multilevel model was

conducted with perceived value at level one, psychopathy (as measured using the SRP-SF or SD3) at level two, and the cross-level interaction between these variables. Results of this analysis indicated that there was not a significant interaction between SRP-SF psychopathy ($\beta = 0.09, p = 0.78$) or SD3 psychopathy ($\beta = 0.16, p = 0.54$) and perceived value on participants' decisions.

Overall, these results provide mixed support for the second part of the third hypothesis that those higher in Machiavellianism would change their behavior in the prisoner's dilemma task due to their perception of their partner's value. Yet, it is important to remember that due to the failure of the first part of the third hypothesis, the planned analyses were not conducted. Therefore, the marginally significant interaction between SD3-Machiavellianism and perceived value is the result of an unplanned analysis and needs further research, specifically a planned replication.

As there was a significant effect of gender in the first study, the effect of gender was again considered in this study. However, unlike in the first study, there were no interactions between Machiavellianism and gender or psychopathy and gender on participants' choice in the prisoner's dilemma game, $p's > 0.05$. There were also no significant three-way interactions between Machiavellianism or psychopathy, gender, and perceived value or condition, $p's > 0.05$. Finally, the effect of age was also examined in this study as in Study 1. As with gender, there was no significant interaction of either Machiavellianism or psychopathy with age, $p's > 0.05$. There were also no significant three-way interactions with perceived value or condition, $p's > 0.05$.

DISCUSSION

One of the main objectives of this study was to compare the flexibility of the decision-making styles associated with Machiavellianism and psychopathy. Theoretically, Machiavellianism is distinct from psychopathy insofar as those higher in Machiavellianism, but not those higher in psychopathy, change their behavior based on external cues in order to achieve the best outcome for themselves (Bereczkei, 2015). To test this empirically, participants

completed a one-shot prisoner's dilemma game in which they had to decide whether to cooperate with their game partner. The best outcome for the participant could be obtained by choosing not to cooperate with their partner. Contrary to the first hypothesis, those higher in psychopathy did not choose the non-cooperative option significantly more often than those lower in psychopathy. This is in contrast with previous research findings that those higher in psychopathy will behave selfishly to obtain the best outcome for themselves (e.g., Jones, 2013).

In contrast to the second hypothesis, those higher in Machiavellianism did not choose the non-cooperative option more often in the condition in which a stranger was their partner compared to the condition in which their friend was their partner. This finding is contrary to previous research on Machiavellianism using public goods games (a multi-player version of the prisoner's dilemma game) which have found that those higher in Machiavellianism behave selfishly to obtain the best outcome for themselves when they will not experience negative outcomes based on this selfish behavior (Bereczkei & Czibor, 2010).

One possible explanation for these findings is that there was not sufficient variance in participants' choices in the prisoner's dilemma task. Specifically, only twenty-three percent or thirty-five participants chose not to cooperate in the condition in which they did not know their partner and only six percent or ten participants chose not to cooperate in the condition in which their partner was their friend. This lack of variation may have thus led to the null findings which contradicted the first two hypotheses as well as previous research.

The second objective for this study was to investigate the reason those higher in Machiavellianism are concerned with their reputations. Previous research has shown that those higher in Machiavellianism make different decisions when those decisions are made in public versus private (Bereczkei, Birkas & Kerekes, 2010). However, according to theory, it is unlikely that those higher in Machiavellianism change their public behavior due to communal concerns over getting along with others (Lyons & Aitken, 2010). Instead, it was expected that participants higher in Machiavellianism would behave more selfishly in the stranger condition compared to

the friend condition due to their perceptions of their partner's value for the participants' future agentic success. This hypothesis received limited support.

Expressly, the first part of this hypothesis – that those higher in Machiavellianism would behave more selfishly in the stranger condition compared to the friend condition – was not supported as is discussed above. However, there was a marginally significant interaction between Machiavellianism, as measured using the SD3, and perceived value on participants' choices in the prisoner's dilemma task. Specifically, those with higher scores on the SD3 Machiavellianism scale tended to cooperate more often when they perceived their partner as valuable and cooperated less often when they perceived their partner as less valuable. This interaction was not observed for participants' ratings of closeness with their partners or trust in their partner cooperating with them. In this way, this finding indicates that those higher in Machiavellianism are concerned with promoting others' positive impressions in order to achieve their own success and not due to an intrinsic concern with communality. However, replication is needed.

Nevertheless, the interaction between Machiavellianism and perceived value was only observed when Machiavellianism was measured using the SD3; the interaction between Machiavellianism as measured using the Mach-IV and perceived value was not significant. There are two explanations which are the most likely reasons why these discrepant findings occurred. On the one hand, the SD3 Machiavellianism scale better represents the theoretical components of Machiavellianism when compared to the Mach-IV (Vize et al., 2016). Thus, it is possible that the marginally significant interaction between Machiavellianism and perceived value was found when the SD3 Machiavellianism scale was used because this scale better represents the theoretical underpinnings of the personality trait (Jones & Paulhus, 2014). On the other hand, it is also possible that the interaction between SD3 assessed Machiavellianism and perceived value was a spurious result.

Chapter 4: General Discussion

Recently, researchers have called into question the distinctiveness of Machiavellianism from psychopathy given the similarity between these traits in self-reported outcomes and associations with the five factor model of personality (e.g., Vize et al., 2016). Yet, a major problem in determining the distinctiveness of psychopathy and Machiavellianism is the dearth of studies directly comparing the traits on findings considered foundational or theoretically central to each trait. Thus, the purpose of the present research was to examine the distinctions between psychopathy and Machiavellianism on foundational and theoretically relevant effects.

The first study compared psychopathy and Machiavellianism in terms of their relationship with passive avoidance learning. In the psychopathy literature, a well-studied finding is that those higher in psychopathy fail to attend to peripheral cues to punishment when pursuing a goal (Smith & Lilienfeld, 2015). Specifically, when in pursuit of a goal, those higher in psychopathy fail to learn un-stated associations between cues and punishment; this deficit is termed poor passive avoidance learning. The results of this first study indicated that those higher in Machiavellianism do not exhibit poor passive avoidance learning. This finding suggests that the attentional issues typically characteristic of psychopathy is not a feature of those higher in Machiavellianism. More generally, this result supports the behavioral flexibility theory of Machiavellianism insofar as their apparent ability to consider cues to punishment is a logical prerequisite to altering one's behavior based on said cues to punishment. In this way, this result is consistent with previous findings on Machiavellianism that those higher in this trait are sensitive to punishment contingencies in that they change their behavior based on alterations in the likelihood of positive or negative outcomes (e.g., Bereczkei & Czibor, 2014; Jones, 2014; Jones & Paulhus, 2017).

In contrast to previous research, however, those higher in psychopathy did not exhibit poor passive avoidance learning. This finding is contrary to a number of previous studies that have established a relationship between psychopathy and poor passive avoidance learning (e.g.,

Newman et al., 1990). Indeed, the poor passive avoidance learning of psychopaths is one of the main theoretical deficits proposed for those higher in psychopathy and serves as the basis for several theories of psychopathy (e.g., the Response Modulation Hypothesis; Baskin-Sommers & Newman, 2013). Therefore, it is unexpected that in my sample, psychopathy was not associated with this deficit.

In examining the potential reasons for the failure to find an association between psychopathy and passive avoidance learning in this first study, one likely explanation is that this relationship is dependent upon gender. Relatively few studies have examined the interactional effect of gender and psychopathy on passive avoidance learning and the results of the existing studies report somewhat mixed results. For example, a study including participants sentenced to probation for a misdemeanor had participants complete an assessment of passive avoidance learning and a self-report measure of psychopathy (Epstein et al., 2006). This study found no interaction between gender and psychopathy. In contrast, two other studies had incarcerated, female, inmate participants complete a passive avoidance learning task and assessed their levels of psychopathy using a clinical measure (Vitale et al., 2007; Vitale & Newman, 2001). These studies found that the expected relationship between psychopathy and passive avoidance learning did not emerge for female participants.

To test the possibility that there was a significant effect of gender in this sample, an interaction between gender and psychopathy on passive avoidance learning was explored. This result indicated that there was a significant psychopathy and gender interaction such that only males higher in psychopathy exhibited poor passive avoidance learning. This interaction replicates the two previous studies which have found a significant effect of gender on passive avoidance learning (Vitale et al., 2007; Vitale & Newman, 2001). Furthermore, this is the first study to report such an interaction using a non-incarcerated online sample and self-report measures. In this way, this study serves to highlight the critical importance of examining the effects of gender when considering the effects of psychopathy. This may be especially important

when the dependent variable of interest is related to the attentional deficits of those higher in psychopathy.

The primary goal of the second study was to examine the difference between psychopathy and Machiavellianism insofar as their behavioral flexibility. Specifically, researchers have proposed that the distinction between psychopathy and Machiavellianism lies in the ability of those higher in these traits to alter their behavior in accordance with cues to punishment (Bereczkei, 2015). However, few of the studies assessing the behavioral flexibility of those higher in Machiavellianism have included measures of psychopathy. The exclusion of psychopathy measurements in these studies has caused some to question whether this theoretical distinction translates into an empirical distinction (Miller et al., 2016). Thus, one of the purposes of this study was to assess the behavioral flexibility hypothesis of Machiavellianism with measures of both Machiavellianism and psychopathy included.

The results of this second study, however, did not indicate any difference in the decisions made by those higher in either trait. Specifically, I expected, that those higher in psychopathy, as well as those higher in Machiavellianism would make selfish decisions in order to obtain the best outcome for themselves, when there was not a potential for punishment. However, I also expected that those higher in Machiavellianism would alter their behavior in a less selfish direction when there were potential consequences for behaving selfishly. However, there was no effect of psychopathy or Machiavellianism on the decisions made under either contingency. Thus, these results contradict the findings from numerous previous studies.

At least five studies have found that those higher in psychopathy make selfish decisions in the prisoner's dilemma task – the same task used in this study (Curry, Chesters, & Viding, 2011; Gervais, Kline, Ludmer, George & Manson, 2013; Johnston, Hawes & Straiton, 2014; Mokros et al., 2008; Rilling et al., 2007)¹³. Only one study – with an extremely small sample (i.e., thirty psychopaths and twelve controls) – has found no effect of psychopathy on decisions

¹³ Four of these five studies were conducted using non-clinical (i.e., undergraduate or community) samples.

made in the prisoner's dilemma task (Widom, 1976). Similarly, previous studies have found that those higher in Machiavellianism also behave selfishly in prisoner's dilemma tasks (Gunnthorsdottir, McCabe & Smith, 2002) and the multi-player version of this task (i.e., public goods games; Bereczkei & Czikor, 2014; Czikor & Bereczkei, 2012) when such behavior is likely to result in a better outcome for themselves. Again, only studies with small samples (e.g., sixty or fewer) and/or few participants who chose to behave selfishly (e.g., less than fifteen) failed to find the expected effect of Machiavellianism (Kurzban, & Houser, 2001; Lyons & Aitken, 2008; Wrightsman, 1996).

Based on these findings it is likely that the failure to find an effect of either personality trait in this study was due to the frequency with which participants' chose to behave selfishly. Specifically, previous studies examining decisions of participants' in one-shot prisoner's dilemma tasks that had thirty or fewer participants who behaved selfishly did not find the expected effects of Machiavellianism (Lyons & Aitken, 2008) or psychopathy (Curry et al., 2011). Although the present study had a larger sample size – by at least fifty-one participants – than these two previous studies, only thirty-five participants chose to behave selfishly in the stranger condition and only ten participants chose to behave selfishly in the friend condition. Thus, it is possible that no effect emerged for Machiavellianism and psychopathy in this study because of the small number of participants who chose to behave selfishly. Unfortunately, this precludes the comparison of Machiavellianism and psychopathy insofar as the behavioral flexibility hypothesis based on these findings.

Another goal of the second study was to investigate the reason those higher in Machiavellianism are concerned with their reputation. Specifically, a previous study demonstrated that Machiavellians alter their behavior in public and private (Bereczkei et al., 2010). As high Machiavellian individuals are generally less concerned with having close interpersonal relationships with others (e.g., Rauthmann & Kolar, 2013), this change in behavior exhibited by those higher in Machiavellianism in public may be due to instrumental concerns about reputation. To test this hypothesis, participants' perception of the value of their partners in

the prisoner's dilemma tasks for their personal success, was assessed. I expected that those higher in Machiavellianism would change their decisions when playing the prisoner's dilemma task with their friend versus a stranger due to differences in the perceived value of their friend and a stranger.

Unfortunately, the planned analyses to test the effect of reputation on the change in the decisions made by those higher in Machiavellianism across conditions of the prisoner's dilemma task could not be conducted because those higher in Machiavellianism did not change their behavior across conditions. Nevertheless, the results of an exploratory analysis indicated that those higher in Machiavellianism did make fewer selfish decisions when they perceived their partner as *valuable* for their future success and more selfish decisions when they perceived their partner as less valuable for their future success. This result is consistent with previous findings that suggest those higher in Machiavellianism engage in impression management behaviors to achieve an agentic goal. For example, those higher in Machiavellianism are more likely to use ingratiation tactics in hypothetical job interviews than those lower in Machiavellianism (Pandey & Rastogi, 1979). Furthermore, high Machiavellian individuals are more likely to engage in prosocial workplace behaviors to maintain their co-workers and bosses positive impressions of them (Becker & O'Hair, 2007).

The finding that those higher in Machiavellianism behaved less selfishly towards individuals they perceived as being valuable for their future success, also extends previous research on the effect of value on the decisions of high psychopathy individuals. Specifically, a previous study found that participants with high scores on factor one of psychopathy (i.e., interpersonal manipulation and callous affect) behaved more selfishly in a prisoner's dilemma task towards individuals they did not think they would see again (Gervais et al., 2013). Researchers interpreted this finding to indicate that those higher in factor one psychopathy behaved more selfishly towards these partners because they viewed these partners as less valuable. Yet, in the present study, there was not a significant interaction between psychopathy and value on decisions made in the prisoner's dilemma task. However, the overlap or core

feature(s) of psychopathy and Machiavellianism is Hare's Factor 1 of psychopathy, which is callousness and manipulation (Jones & Figueredo, 2013; Marcus, Preszler & Zeigler-Hill, 2018). Together, these results may indicate that the importance of a target's perceived value is more closely associated with the core features of these personality traits. It is therefore important that future research investigate the effect of others' perceived value on the decisions made by high Machiavellian and psychopathic. By conducting such comparisons, future researchers may determine whether such effects are most closely associated with the unique features of Machiavellianism or the core features of both traits

LIMITATIONS & FUTURE DIRECTIONS

The main limitation affecting the interpretation of the effects discussed in this paper is that several of the findings were not the result of pre-specified hypotheses and analyses plans. Specifically, the interaction between psychopathy and gender on poor passive avoidance learning in study one was not predicted and emerged from exploratory analysis. Additionally, although the interaction between Machiavellianism and perceived value was theoretically expected, it was not the result of a planned analysis. Therefore, it is key that future studies attempt to replicate these findings in order to determine whether these are true effects or artifacts of these studies' data.

Another limitation of these studies is that both samples were recruited from community or everyday populations; the sample in study one was recruited from an online convenience sample and the sample in study two was recruited from an undergraduate sample. As both of psychopathy and Machiavellianism are predictive of important antisocial outcomes, different populations may result in greater variation in levels of these personality traits. In fact, individuals with very high levels of psychopathy are more likely to be found in prisons than in everyday life (Hare & Neumann, 2008). Therefore, it would be useful for future studies to examine the differences between psychopathy and Machiavellianism in different contexts – such as prisons –

to establish that any significant differences between these traits is also evidenced in extreme scorers.

The findings across both studies in this paper also highlight the importance of using multiple measures of psychopathy and Machiavellianism when examining the effects of these traits; or at least replicating any significant effects across multiple measures. In the two studies above, psychopathy and Machiavellianism were both assessed using the Short Dark Triad scales and the scales originally developed to assess each trait. Yet, the effects found in each study did not replicate across both measures. In study one the psychopathy and gender interaction only emerged when psychopathy was assessed using the Self-Report Psychopathy Short-Form scale (Paulhus et al., 2016); not the Short Dark Triad scale of psychopathy (Jones & Paulhus, 2014). In study two, however, the Machiavellianism and perceived value interaction was only emerged when Machiavellianism was assessed using the Short Dark Triad; not the Mach-IV (Christie & Geis, 1970). Indeed, Vize and colleagues (2016) have also reported that the findings regarding psychopathy and Machiavellianism vary based on the measure used to assess each trait. Nevertheless, recommendations as to which scales should be used to assess these traits vary.

Vize and colleagues (2016) recommend using the Short Dark Triad, because this measure appears to distinguish between psychopathy and Machiavellianism more than do the traditional measures of each trait. Muris and colleagues (2017), however, suggest using the traditional measures created to assess psychopathy and Machiavellianism as they contend these measures more accurately reflect the theoretical underpinnings of these traits. Given the lack of consensus on which measures best reflect these traits, as well as the findings in this study and others that the effects of psychopathy and Machiavellianism are not measure independent, it is currently most advisable to include both Short Dark Triad and traditional measures in all studies assessing the effects of these traits.

CONCLUSIONS

The purpose of the present studies was to differentiate psychopathy and Machiavellianism based on theoretically meaningful variables. Recently, some researchers have questioned whether or not these traits are truly distinct (e.g., Miller et al., 2016). Yet, these criticisms have primarily been based on meta-analytic reviews that relied primarily on atheoretical research with self-reported dependent variables. There are, however, theoretical decision-making differences between Machiavellianism and psychopathy. These studies, therefore, intended to add to the small number of studies which have directly compared psychopathy and Machiavellianism using theoretically meaningful outcomes. Overall, the present studies provide some evidence that these traits differ in attentional processing and the influence of others' perceived value on selfish behavior. Specifically, the first study found that only males, high in psychopathy exhibited poor passive avoidance learning. In contrast, those higher in Machiavellianism did not exhibit the key attentional deficits exhibited by men high in psychopathy. Furthermore, the second study found that those high in Machiavellianism, but not those high in psychopathy, altered their behavior based on their perception of their partner's value. Expressly, those higher in Machiavellianism behaved somewhat less selfishly when they viewed their partner as valuable to their future success. This finding adds further support to the idea that the behavioral flexibility is inherent to Machiavellianism. Specifically, those higher in Machiavellianism change their behavior based on altering punishment contingencies, whereas those higher in psychopathy do not. Nevertheless, these findings require replication because they were not the result of pre-registered hypotheses and analysis plans. However, these studies should serve as inspiration for future studies examining the differences between these personality traits.

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Appendix A

Instructions Presented to Participants for Go/No-Go Task

Introduction

Today you will be participating in a task in which you can earn real money.

Twenty-five participants will be randomly determined to actually earn the amount of money they earn in this task.

Spacebar >>

Introduction

In this task you will see a series of 10 numbers.

5 numbers will be “go” numbers. The other 5 numbers will be “nogo” numbers.

When you see a “go” number, press the Spacebar as fast as possible. When you see a “nogo” number, you shouldn’t do anything.

Spacebar >>

Introduction

You will begin the task with \$4.50.

Pressing the Spacebar when you see a “go” number will result in earning 10 cents.

Pressing the Spacebar when you see a “nogo” number will result in losing 10 cents.

Spacebar >>

Introduction

You will not know which are “go” numbers and which are “nogo” numbers before you begin the study.

You must learn which numbers are “go” numbers and which numbers are “nogo” numbers through trial and error.

Spacebar >>

Summary

You begin the task with \$4.50

Press Spacebar to “go” number → gain 10 cents

Press Spacebar to “nogo” number → lose 10 cents

You must learn which are “go” numbers and which are “nogo” numbers through trial and error.

Spacebar >>

Summary

The task will now begin.

Please try to earn as much money
as possible.

Spacebar >>

Appendix B

Study 1 Debriefing Statement

Thank you for volunteering for this study. The purpose of this study is to examine individual differences in passive avoidance learning. Specifically, passive avoidance learning involves learning about a relationship between a certain behavior and punishment. Previous research has indicated that individuals with different personalities vary in how quickly they exhibit passive avoidance learning.

Feel free to contact the researcher for further information regarding this study. However, please note that we will not be able to disclose results regarding your individual performance. For ethical reasons we will not know any individuating information regarding our participants' performance on any single measure or scale or test in the study that you have just completed. We will be able to discuss general results and findings with you at such a time as we can compile and analyze enough data.

Appendix C

Instructions Presented to Participants for the Prisoner's Dilemma Task

Game Instructions

Your choice:

- You will begin the game with \$1.00 and an envelope
- You may choose to either:
 - keep the dollar for yourself
 - put the dollar in an envelope to send to your partner
- If you choose to send the dollar to your partner, the dollar will be doubled by the researcher.

Your partner's choice:

- Your partner will also begin the game with \$1.00.
- Your partner must also choose to either:
 - keep the dollar for themselves
 - put the dollar in an envelope and send it to you.
- If your partner chooses to send the dollar to you, the dollar will be doubled by the researcher.

Possible Outcomes

		Partner's Choice	
		Send \$1.00	Keep \$1.00
Your Choice	Send \$1.00	You: \$2.00 Partner: \$2.00	You: \$0.00 Partner: \$3.00
	Keep \$1.00	You: \$3.00 Partner: \$0.00	You: \$1.00 Partner: \$1.00

Appendix D

Study 2 Debriefing

Thank you for volunteering for this study. The purpose of this study is to examine the effect of personality and relationships with others on decision-making. Previous research has indicated that individuals with different personalities make different choices when money is involved. Additionally, one's relationship with another might affect how they make decisions.

If participant asks for more information:

Feel free to contact us for further information regarding this study. However, please note that we will not be able to disclose results regarding your individual performance. For ethical reasons we will not know any individuating information regarding our participants' performance on any single measure or scale or test in the study that you have just completed. We will be able to discuss general results and findings with you at such a time as we can compile and analyze enough data.

Appendix E

Study 2 Script of Researcher/Participant Interaction

EXPERIMENTER: Hi are you both here for the study titled Money Decisions?

EXPERIMENTER: Ok, before we begin let me ask you a few questions.

1. Are you two related?
2. Are you two in a romantic relationship?
3. Do you both identify as the same gender?
4. Have either of you previously completed this study?

If participants answer YES either of first two questions or NO to any of questions 3 and 4:

EXPERIMENTER: Ok, so unfortunately you two do not meet the requirements to participate in the study “Money Decisions”. You both may complete an alternate study and earn course credit for participating. Unfortunately, you will not have the opportunity to earn money as part of this alternate study. Would either of you be interested in participating in an alternate study?

If yes, take to experimental room and open link titled “Alternate Study”

If participants answer NO either of first two questions or YES to any of questions 3 and 4:

EXPERIMENTER: Ok, so I’m going to have you (indicate one of the two of the participants) follow me. You (indicate the other of the two participants) can follow the other researcher.

Take participant to experimental room.

Turn on sound machine.

EXPERIMENTER: First, here is a consent form for you to sign. Please know you are free to withdraw from this study at any time without penalty.

Hand consent form.

Game Instructions

EXPERIMENTER: Ok, today you will be playing a game with the opportunity to earn real money. You will earn this money in addition to any course credit you are already receiving for this study.

EXPERIMENTER: First, I will explain the rules of the game. Here is a copy of the instructions for this game for you to follow along with me.

Hand paper titled "Game Instructions".

EXPERIMENTER: In this game you and a partner will be asked to make a choice about what to do with \$1.00. You will begin the game with \$1.00 and an envelope. You may choose to either keep the dollar for yourself or put the dollar in the envelope to send to your partner in the game. If you choose to send the dollar to your partner, the dollar will be doubled by the researcher. Your partner will be asked to make the same choice. Specifically, your partner will also begin the game with \$1.00 and an envelope. Your partner must choose to either keep the dollar for themselves or put it in an envelope and send it to you. If your partner chooses to send the dollar to you, the dollar will be doubled by the researcher. Do you have any questions about the game so far?

Answer questions if they have any.

EXPERIMENTER: At the bottom of the instruction sheet is a table outlining the possible outcomes for yourself and your partner. I will now go over the possible outcomes with you. So let's say you choose to send the dollar to your partner and your partner also chooses to send the dollar to you. The researcher will double these dollars and you will both end the game with \$2.00. Do you have any questions about the game so far?

Answer questions if they have any.

EXPERIMENTER: However, let's say you choose to send your partner the dollar, but your partner decides to keep their dollar. The dollar you sent your partner would be doubled to \$2.00 so your partner would have this \$2.00 from the dollar you sent them in addition to the dollar they kept instead of sending it to you for a total of \$3.00. You, on the other hand, would end the game with \$0.00 as you sent your dollar to your partner and your partner did not send anything to you. Do you have any questions about the game so far?

Answer questions if they have any.

EXPERIMENTER: Alternatively, you could decide to keep your dollar and your partner could decide to send you their dollar. The dollar your partner sent you would be doubled to \$2.00. Thus, you would have this \$2.00 in addition to the dollar you kept for a total of \$3.00. Your partner, on the other hand, would end the game with \$0.00 as they sent you their dollar and did not receive any money from you. Do you have any questions about the game so far?

Answer questions if they have any.

EXPERIMENTER: Finally, you and your partner could both decide to keep your dollars. In this scenario you would both end the game with \$1.00. Please note your partners will know whether you decided to send them the dollar or not. Do you have any questions about the game so far?

Answer questions if they have any.

EXPERIMENTER: Ok, now I'm going to ask you a few questions about this game.

EXPERIMENTER: So if you decide to send your partner \$1.00 and your partner decides to send you \$1.00, how much money would you end the game with?

Correct them if they are wrong and ask the question again. Say "Good" and move on if they are right. Correct answer is \$2.00.

Record whether they got the question right or wrong on the running log.

EXPERIMENTER: So if you decide to keep your \$1.00 and your partner decides to send you \$1.00, how much money would you end the game with?

Correct them if they are wrong and ask the question again. Say "Good" and move on if they are right. Correct answer is \$3.00.

Record whether they got the question right or wrong on the running log.

EXPERIMENTER: So if you decide to send your partner \$1.00 and your partner decides to keep their dollar, how much money would your partner end the game with?

Correct them if they are wrong and ask the question again. Say "Good" and move on if they are right. Correct answer is \$3.00.

Record whether they got the question right or wrong on the running log.

EXPERIMENTER: So if you decide to keep your \$1.00 and your partner decides to keep their dollar, how much money would your partner end the game with?

Correct them if they are wrong and ask the question again. Say "Good" and move on if they are right. Correct answer is \$1.00.

Record whether they got the question right or wrong on the running log.

Friend Round

EXPERIMENTER: Ok you will complete this game twice, each with a different partner. First you will complete the game with your friend whom you came in with today as your partner. Specifically, your friend whom you came in with today and who is in the other experimental room is your partner for this round. Do you have any questions about this?

Answer questions if they have any.

EXPERIMENTER: Ok, now it's time to make your selections. Here is \$1.00 and an envelope. If you want to send your friend the dollar please put it in the envelope and hand it back to me. If you want to keep the dollar please hand back the envelope empty. You may reference the instructions sheet and possible outcomes table while making your decision.

Wait for them to make their decision.

Mark decision on Running Log.

Stranger Round

EXPERIMENTER: Ok, for this next game your partner will be one of the two participants who completed this study in the timeslot immediately before this session. Specifically, one of the two participants who completed this study in the timeslot directly prior to this current session will be assigned to be your partner. Please know you will not be meeting this participant and your identity will not be shared with this participant. Do you have any questions about this?

Answer questions if they have any.

EXPERIMENTER: Ok, now it's time to make your selections. Here is \$1.00 and an envelope. If you want to send your partner the dollar please put it in the envelope and hand it back to me. If you want to keep the dollar please hand back the envelope empty. You may reference the instructions sheet and possible outcomes table while making your decision.

Wait for them to make their decision.

Mark decision on Running Log.

Questionnaire

EXPERIMENTER: Ok, that concludes the game portion of this study. You will now be answering some questions on the computer.

EXPERIMENTER: Ok, you will be at this computer. You will answer a series of questions. Please answer as honestly as possible. When you are finished please open the door and I will come back and administer the final portion of the study.

Wait for participant to finish survey.

Determine amount of money earned by participant, collect that amount, and set up receipt.

EXPERIMENTER: Thank you for volunteering for this study. The purpose of this study is to examine the effect of personality and relationships with others on decision-making. Previous research has indicated that individuals with different personalities make different choices when money is involved. Additionally, one's relationship with another might affect how they make decisions.

EXPERIMENTER: This concludes your participation in this study. We ask that you do not share any information regarding this study with other students so that future participants' choices will be unbiased. Do you agree to not discuss information regarding this study with other participants?

Wait for verbal confirmation

If participant asks for more information:

Feel free to contact us for further information regarding this study. However, please note that we will not be able to disclose results regarding your individual performance. For ethical reasons we will not know any individuating information regarding our participants' performance on any single measure or scale or test in the study that you have just completed. We will be able to discuss general results and findings with you at such a time as we can compile and analyze enough data.

EXPERIMENTER: Based on the decisions made in this study you earned *(insert monetary amount earned)*. Before I give you your money, please sign this receipt.

Hand receipt list.

EXPERIMENTER: Thank you and here is the money you earned.

Hand money.

Vita

Jessica Rose Carre earned her Bachelor of Arts in Psychology from Furman University in 2013. She entered the doctoral program at the University of Texas at El Paso in 2013. During her time at Furman she worked in several research laboratories and completed an honor's under the supervision of Frank Provenzano, PhD.

In the course of her doctoral work she received her Master of Arts degree in Experimental Psychology in 2016. Jessica has published four first authored papers in several journals including Journal of Personality Disorders, Review of General Psychology, Journal of Personality and Individual Differences, and Managerial Auditing Journal. She has also presented five posters at national psychology conferences such as the Society for Personality and Social Psychology. Jessica will continue her research as a Postdoctoral Researcher at The Mind Research Network.

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