2016-01-01

Making Decisions Affecting Oneself Versus Others: The Mediating Effect Of Interpersonal Closeness And Dark Triad Traits

Jessica R. Carre
University of Texas at El Paso, jrcarre@miners.utep.edu

MAKING DECISIONS AFFECTING ONESELF VERSUS OTHERS: THE MEDIATING EFFECT OF INTERPERSONAL CLOSENESS AND DARK TRIAD TRAITS

JESSICA ROSE CARRE

Master's Program in Experimental Psychology

APPROVED:

Daniel N. Jones, Ph.D., Chair

Michael A. Zárate, Ph.D.

Lawrence D. Cohn, Ph.D.

Daniel S. Scheller, Ph.D.

Charles Ambler, Ph.D.
Dean of the Graduate School

Dedication

To my mother and David who taught me anything is possible if you work hard enough for it.

&

To my grandparents who taught me the importance of education.

MAKING DECISIONS AFFECTING ONESELF VERSUS OTHERS: THE MEDIATING EFFECT OF INTERPERSONAL CLOSENESS AND DARK TRIAD TRAITS

by

JESSICA ROSE CARRE, B.A.

THESIS

Presented to the Faculty of the Graduate School of

The University of Texas at El Paso

in Partial Fulfillment

of the Requirements

for the Degree of

MASTER OF ARTS

Department of Psychology

THE UNIVERSITY OF TEXAS AT EL PASO

December 2016

Acknowledgements

I would first like to express my deep gratitude to Dr. Daniel N. Jones for his tremendous support of this project and my career. His passion and commitment to research serve to inspire those he mentors and I am proud to be part of his lab.

I would also like to thank Drs. Cohn, Zárate, and Scheller for their many contributions in the early stages of project development. Their critiques and encouragement have made this project all the better.

Finally, I would like to thank the tireless research assistant who helped me collect the data for this project; without you all this would have been impossible. So thank you Luis Nava, Natalia Norzagaray, Denise Meneses, Leon Armstrong, and Melissa Montelongo for your help.

Abstract

The payment incentives of portfolio managers and investors are often asymmetrical such that actions that benefit the portfolio manager can harm the client and vice-versa. Despite the presence and potential harm of these asymmetries, relatively little research has investigated self and other decision making broadly. There has also been few attempts to address the effect of reward asymmetries. Additionally, despite the presence of reward asymmetries not every portfolio manager will make risky decisions for their clients, which suggests the presence of an individual difference characteristic. This study addresses these knowledge gaps by examining the effect of interpersonally manipulative personality traits (the Dark Triad) on decision making for the self, others, and under reward asymmetries. The potential positive effect of bonding on participants was also examining. Narcissism and psychopathy were both associated with making riskier decisions for others under reward asymmetries. However, there was an interaction between these personalities, bonding and numeracy such that those high in narcissism and subjective numeracy who bonded with their client made less risky decisions under reward asymmetries. Those high in psychopathy and lower in objective numeracy who bonded with their client made riskier decisions for their client in the other-reward only scenario. The implication of these results for decision making for self and others is discussed.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

There are many situations in which some individuals give most - if not all - of their decision making control to another person (e.g., investment portfolio managers, power-of-attorney, and doctors). Generally, this transfer of control is done with the expectation that the other person will act in accordance with one's best interest. For example, one might decide to transfer control of investment decisions to an investment portfolio manager because one believes the manager will behave in ways that will ensure a positive outcome. However, in this case there are incentive asymmetries in place that threaten this assumption; often investment portfolio managers are paid for every action taken on an investment account, meaning they are largely unaffected by gains or losses (Brown, 1996). This payment structure can lead to "churning" or excessive trading in order to generate commissions (Brown, 1996). Churning is problematic for the individual as this excessive trading can be detrimental to the investor (Barber & Odean, 2000).

Nevertheless, not every investment portfolio manager will make decisions contrary to their clients' best interest, nor will they necessarily make selfish decisions for all of their clients (Allen & Gorton, 1993). Yet, there is a dearth of research examining the ways in which individuals balance self-benefit with other cost. Most glaring, there is a lack of studies examining the effect of individual differences on the manner in which individuals balance self-benefit with other cost. Three personality traits – together referred to as the Dark Triad – are associated with greater concern for self, as opposed to other, interest (e.g., Jones & Figuredo, 2013). Therefore, these traits are most likely to be associated with greater prioritization of self-interest over other-interest and may explain differences in selfish versus selfless decisions made by portfolio managers. This study aims to address the lack of research examining decision-

making involving the consideration of self-interest and other-interest and the interplay of malevolent personalities. Specifically, the present study examines the ways in which individuals balance self-benefit with other-cost, as well as the effect of dark personalities on this process, and a potential avenue to deter selfish decision-making.

1.1 Decision-Making for the Self and Others

A considerable amount of research has focused on how individuals make decisions for themselves. In contrast, there has been comparatively less research conducted examining the decision-making processes underlying decisions made on behalf of others. Additionally, there is a distinct lack of studies examining the differential weighting of self and other consequences under reward asymmetries (i.e., oneself benefits from something that would harm another). The existing literature, however, suggests that individuals make different decisions for others than they would make for themselves (i.e., self-other asymmetry). For example, individuals exhibit less loss aversion (i.e., the preference to avoid losses rather than acquire gains; see Tversky & Kahneman, 1991 for a review) when making decisions for others than when making decisions for themselves (e.g., Andersson, Holm, Tyron & Wengström, 2013; Polman, 2012). Further, people consider risky economic decisions as being less risky when the consequences involve others than when they involve the self (Mengarelli, Moretti, Faralla, Vindras & Sirigu, 2014). Individuals are also less likely to engage in measures to prevent a potential negative consequence when the consequence will be suffered by others than when it will be suffered by the self (Pollai & Kirchler, 2012). Three perspectives have emerged to explain self-other asymmetry: (1) social values, (2) cognitive, and (3) risk-as-feelings.

The central argument of the social values explanation of self and other decision making asymmetry is that people make decisions for others based on the social value associated with

risk-taking in the given situation (Stone & Allgaier, 2008). More specifically, individuals place greater weight on the societal value associated with risk-taking when making decisions for others than when making decisions for the self (Stone & Allgaier, 2008). From this perspective, self-other asymmetries in decision-making will exist only in situations in which risk is socially valued (Stone & Allgaier, 2008). Note, however, that the social value of risk-taking need not be objective, merely perceived by the decision maker as valued (Stone & Allgaier, 2008). This view is supported by findings such that individuals exhibit less risk aversion when making decisions for others in domains in which risk-taking is valued (e.g., relationships) compared to domains in which risk-aversion is not valued (e.g., health and physical safety) (e.g., Beisswanger, Stone, Hupp & Allgaier, 2003; Garcia-Retamero & Galesic, 2012; Stone, Choi, de Bruin & Mandel, 2013).

Much of the support for this theory, however, comes from studies examining the deviation of decisions made for the self and others to "ideal" decisions or decisions made for the "ideal" self (e.g., Stone & Allgaier, 2008). Therefore, these studies rely on the assumption that the "ideal" decision reflects the socially valued decision; yet, it is possible that these decisions reflect choices made under "ideal" circumstances wherein the "ideal" outcome is certain. Furthermore, these studies have also largely relied upon responses to hypothetical scenarios; yet, studies have shown that responses to hypothetical scenarios differ from responses to real decisions (Hsee & Weber, 1997). As such, although it is possible that decision making for others reflects a regression to a risk-neutral point, more research is needed to determine if the risk-neutral point reflects a socially defined level of acceptable risk.

Another explanation of self-other discrepancies in risk-taking is that individuals engage in fundamentally different cognitive processes when making decisions for themselves versus

others. Researchers have variously argued that individuals differ in the information used to make decisions for others, the effort used to make decisions for others, and the motivation to make decisions likely to result in positive outcomes for others. For the purpose of clarity, we will refer to this constellation of arguments as the cognitive hypothesis. There is evidence to support some of these assertions such as the suggestion that individuals engage in different informational processes when making decisions for others. Studies have shown that individuals use more information when making decisions for themselves compared to others (Kray, 2000; Kray & Gonzalez, 1999). For example, individuals asked to rate the importance of job attributes in terms of deciding for two jobs rated more aspects as important when making the decision for someone else than when making the decision for themselves (Kray, 2000). Additionally, individuals have been shown to differentially weight aspects of a decision when making decisions for the self or others (e.g., rate feasibility of options as more important when deciding for others and desirability as more important when deciding for themselves) (Lu, Xie, Xu, 2012), experience more pre-decisional distortion when making decisions for others (Polman, 2010), and weight negative outcomes more heavily than positive ones when making decisions for the self (Beisswanger et al., 2003). Together these findings suggest that individuals cognitive processing and use of information differs when making decisions involving others versus themselves

Although individuals might vary in the cognitive processes used when making decisions for themselves or others, this is not because individuals do not believe others are more risk seeking than themselves. Studies have shown individuals perceive others would make decisions about as risk-averse (Chakravarty, Harrison, Haruvy, & Rustrom, 2005) as they would for themselves. Further, individuals exhibit self-other discrepancies in decision-making even when they are able to accurately predict the level of risk-aversion of others (Garcia-Retamero &

Galesic, 2012). Thus, the differences in utilization of information when making decisions for the self and others is not due to a failure to conceptualize the preferences of others. Further, the supposition that individuals differ in the effort and motivation used in making decisions for others compared to decisions made for the self has not borne out in studies examining self and other decision making (Hsee & Weber, 1997; Kray, 2000; Livitan, Trope & Liberman, 2008). Together, these studies failed to explain the reason for differences in cognitive processing when making decisions involving onself versus another person.

The risk-as-feelings hypothesis, however, posits a unique effect of emotion, which helps explain differences in cognitive processes when making decisions for oneself versus someone else. Specifically, this hypothesis supposes that individual's behavior in risky situations is due in part to their emotional response to features related to the risk (Loewenstein, Weber, Hsee & Welch, 2001). The core difference between this theory and other explanations of decision-making is that the risk-as-feelings hypothesis posits a unique and direct effect of emotion on behavior (i.e., not necessarily mediated by cognitions) (Lowenstein et al., 2001). The risk-as-feelings hypothesis then suggests that self and other discrepancies are due in part to discrepancies in emotional responses to negative outcomes (Loewenstein et al., 2001).

According to the risk-as-feelings hypothesis, individuals are expected to react more negatively to possible negative outcomes experienced by the self than negative outcomes experienced by others (Loewenstein et al., 2001). This is supported by findings that individuals to weight negative outcomes more negatively when making decisions for themselves than when making decisions for others (Beisswanger et al., 2003). Additionally, neural pathways responsive to rewards soon to be experienced by the self are not activated when the rewards will be experienced by others, suggesting less affective engagement in decisions with outcomes

relevant to others compared to those relevant to the self (Albrecht, Volz, Sutter, Laibson & von Cramon, 2010). These studies support the risk-as-feelings hypothesis perspective that self-other discrepancies are due in part to differences in affective responses to potential outcomes experienced by others versus those experienced by the self.

There is also variation in the emotional engagement in decisions based on how close the individual is to the target for whom they are making a decision. Put another way, individuals generally discount outcomes experienced by others, but the degree of discounting varies depending on how close the other is to the self. For example, individuals made more risk-averse choices when they were primed to think of a friend as being close to them compared to when they were primed to think of a friend as being distant from them (Trump, Finkelstein & Connell, 2014). Moreover, individuals assign more value to something belonging to a close friend than when it belongs to a stranger (Greenstein & Xu, 2015). Individuals also exhibit similar cognitive construals when making a decision for the self and when making the same decision for a close other, but demonstrate different cognitive construals when making the decision for a more distant other (Livitan, Trope, & Liberman, 2008). Neurological investigations have indicated that similar brain regions are activated when a decision involves a close other being rewarded as when a decision involves the self being rewarded (Mobbs et al., 2010). In contrast, different neurological patterns were elicited when decisions affected the self-versus an unknown other (Albrecht et al., 2010). A risk-as-feelings interpretation of these findings suggests that individuals emotional reactions to decisions affecting close others are more similar to decisions affecting the self, and this leads to less self-other asymmetry in decision making.

Several other psychological variables have been implicated as affecting self-other decision-making asymmetry. For example, self-esteem and anxiety have been associated with

variation in self-other decision-making (Wray & Stone, 2005). Additionally, empathy has been shown to affect decisions made for others. For example, when asked to make predictions for others, individuals with higher levels of empathy made predictions more similar to the ones they made for themselves, than did less empathetic individuals (Faro & Rottenstreich, 2006). Another study found that higher levels of trait empathy were associated with less steep temporal discounting when making decisions for others (O'Connell, Christakou, Haffey & Chakrabarti, 2013). These findings highlight the importance of considering individual differences when examining decisions for oneself versus another person as personality traits might affect the cognitive and emotional processes underlying decision making for the self and others.

Three commonly studied personality traits associated with interpersonal manipulation and selfish decision-making are psychopathy, narcissism, and Machiavellianism (together referred to as the Dark Triad) (Paulhus & Williams, 2002). These traits have been associated with greater consideration of consequences and rewards relevant to the self rather than others (e.g., Jones, 2014). Additionally, each of these traits is associated with a unique decision-making style that might lead those higher in these traits to make more self-centered decisions. In this way, those high in these traits are especially likely to pursue selfish interests to the detriment of others making their consideration particularly relevant when examining differences in self and other decision-making. Each personality trait is considered in turn below.

1.2 PSYCHOPATHY

Hervey Cleckley provided the first meaningful definition of psychopathy in his seminal book *The Mask of Sanity* (1982). Cleckley (1982) conceptualized psychopathy as consisting of sixteen criteria including: superficial charm, absence of anxiety, untruthfulness, lack of remorse, failure to learn from experience, affective deficit, inadequately motivated antisocial behavior,

unresponsiveness in interpersonal relationships and incapacity for love. Research on psychopathy is based largely on Cleckley's work and his conceptualization of psychopathy is widely accepted. In fact, some advocate to a return to the study of the traditional "Clecklian" psychopath (Patrick, 2005).

Despite the importance of Cleckley's definition the field was in need of a psychometrically sound measure of psychopathy. Hare (1980) addressed this issue in his publication of the Psychopathy Checklist (PCL). The PCL has the clinician rate individuals from 0 to 2 on 22-items, using a structured interview and file assessment; higher scores reflect greater levels of psychopathy. Research examining psychopathy exploded following the release of the PCL. Now in its second edition - the Psychopathy Checklist-Revised (PCL-R) - this assessment remains the "gold-standard" in clinical psychopathy assessment (Hare, 1991; 2003). Clinical psychopathy assessment is frequently used in research and practice involving correctional populations. In correctional populations the PCL-R is considered a diagnostic tool, often used to differentiate individuals who are psychopaths from those who are non-psychopaths.

Psychometric investigations into the structure of psychopathy, however, have indicated that this personality does not reflect a discrete category, but rather a continuous trait (Levenson, Kiehl & Fitzpatrick, 1995; Lilienfeld & Andrews, 1996; Williams, Hare & Paulhus, 2007). Investigations into psychopathy in everyday populations, or subclinical psychopathy, have shown that an increased presence of the trait positively correlated with increased presence of relevant outcomes (e.g., impulsivity and aggressive behavior) (LeBreton, Binning & Adorno, 2006). Thus, findings using the clinical criteria of psychopathy to examine group differences are

likely to replicate were psychopathy to be examined as a continuous construct.[1] Indeed, there is relative consensus that psychopathy represents deficits in affective and emotional domains as well as impulsivity and behavioral disinhibition (Hare & Neumann, 2005).

The etiological origins of psychopathy have received considerable attention and have resulted in numerous theoretical frameworks. In his seminal article on the topic, Lykken (1957) had participants complete a mental maze, which consisted of twenty choice points and four response options at each point. One of the four response options would allow participants to move forward, whereas one of the three error options (i.e., the choice of which would not allow the participant to move forward) would elicit a shock. The explicit goal of the task was to complete the maze with as few error choices as possible; participants were expected to learn the association between the error response option and the aversive stimulus while completing the task. Psychopaths failed to inhibit responses that would elicit the aversive stimulus (i.e., poor passive avoidance). Further, psychopaths exhibited poor electrodermal conditioning to the aversive stimulus.

Lykken (1957) proposed that these findings were indicative of poor fear conditioning in psychopaths.[2] Further, he argued that the core distinction between psychopaths and non-psychopaths was a lack of fear - an idea referred to as the low-fear hypothesis (Lykken, 1957; Lykken, 1995). The low-fear hypothesis has received support from findings that psychopaths exhibit weaker electrodermal responsivity to aversive stimuli (e.g., Hare, 1978), poor passive avoidance learning (e.g., Hetherington & Klinger, 1964), and reduced fear potentiated

[1] There are some findings that question the generalizability of such findings to special populations, but these arguments are not based on the dimensionality of the construct (for more information see Sullivan & Kosson, 2005 or Verona & Vitale, 2005).

[2] Lykken was specifically concerned with the distinction between primary and secondary psychopathy. However, a complete overview of the subfactors of psychopathy is outside of the scope and purpose of this paper. For more information on debate regarding the subfactors of psychopathy see Williams, Paulhus & Hare, 2007.

responding (e.g., Patrick, Bradley & Lang, 1993). Nevertheless, a number of studies have also reported findings that conflict with those expected based on this model.

Schmauk (1970) attempted to replicate Lykken's (1957) findings using three different aversive stimuli: verbal, physical, and monetary. Psychopaths exhibited the expected poor passive avoidance learning in all but the monetary condition. Later researchers argued that the key difference between conditions in Schmauk's (1970) study was that only the monetary punishment condition did not include a concomitant reward (Newman, Patterson, Howland & Nichols, 1990). In a study examining the importance of reward contingencies, participants completed a go/no-go task with reward and punishment possible, or with only punishment possible (Newman & Kosson, 1986). Psychopathic participants in the reward and punishment conditions exhibited poor passive avoidance learning, but those in the punishment only condition performed as well as their non-psychopathic counterparts (Newman & Kosson, 1986). This study highlighted the importance of the presence of a reward contingency in the relationship between poor passive avoidance learning and psychopathy. Additionally, studies have found that psychopaths do not exhibit poor passive avoidance learning if the presence of punishment is made explicit at the outset of the task (Newman, Patterson, Howland & Nichols, 1990) and breaks are included in the task during which performance feedback is given (Newman, Patterson, & Kosson, 1987). Together, these findings suggest the presence of a dysfunctional attentional system in those with psychopathy.

Based on findings suggestive of the moderating role of attention in psychopathic behavior - which was incongruent with the low-fear hypothesis - Newman and colleagues proposed the response modulation hypothesis (RMH) of psychopathic decision-making (Newman et al., 1990). The RMH proposes that deficits exhibited by those with psychopathy (e.g., poor passive

avoidance learning, electrodermal hyporeactivity) are due to a failure in attention (Newman & Baskin-Sommers, 2012). Specifically, in normal attentional processing individuals will occasionally attend to peripheral stimuli such as the presence of a punishment contingency (i.e., response modulation) (Newman & Baskin-Sommers, 2012). However, when engaged in a goal-directed task, those high in psychopathy exhibit an "attentional bottleneck" in which they fail to attend to information peripheral to their task (Newman & Baskin-Sommers, 2012).

The early selective attention of psychopaths has been shown to moderate the relationship between psychopathy and poor passive avoidance learning (Newman et al., 1990), response perseveration (Newman et al., 1987), and reduced fear potentiated startle (Newman, Curtin, Bertsch & Baskin-Sommers, 2010). Furthermore, a meta-analysis of ninety-four studies, found a significant relationship between psychopathy and response modulation deficits (r = .20) (Smith & Lilienfeld, 2015). The theory has also received support from a more recent meta-analysis specifically examining the relationship between psychopathy and fear deficits (Hoppenbrouwers, Bulten & Brazil, 2016). A significant relationship between psychopathy and deficits in the detection of threat stimuli was found, but not deficits in the response to fear stimuli (Hoppenbrouwers et al., 2016). This is consistent with findings that psychopaths exhibit the expected fear potentiated startle response when they are forced to attend to the threatening stimuli (Newman et al., 2010).

In respect to decision making, the RMH suggests that psychopaths engage in risky behaviors due to their early selective attention, resulting in a later myopic focus on goal-relevant information. Indeed, studies examining the behavioral correlates of psychopathy have found it to be associated with numerous problematic behavioral outcomes including: gambling (e.g., Lösel & Schmucker, 2004), substance abuse (e.g., Smith & Newman, 1990), risky sexual behavior

(e.g., Fulton, Marcus & Payne, 2010), and aggressive behavior (e.g., Walsh, Swogger & Kosson, 2009). Further, those high in psychopathy are willing to accept risk when they will be subject to the consequences, but also when others will suffer the consequences (Jones, 2013). In fact, in a study examining interpersonal harm, psychopathy was the only dark personality associated with willingness to harm a close other for personal profit (Jones, Carre, Tirres, Rangel & Sanchez, 2016). These findings are consistent with Cleckley's (1982) assertion that psychopaths suffer from a "pathological egocentricity and incapacity for love." In addition, personality researchers have found that psychopathy is associated with high agency (i.e., getting ahead) and low communion (i.e., getting along) which suggests that those high in psychopathy care more about their self-interest than the impact of their behavior on others (Salekin, Trobst & Krioukova, 2001). Thus, those high in psychopathy not only make riskier decisions for themselves because they fail to attend to peripheral information, but they are also willing to engage in risk taking when others will suffer the consequences.

1.3 NARCISSISM

According to Greek mythology, a man - Narcissus - loved himself so much that he fell in love with his reflection in a pool of water. His own image was so attractive to himself that he remained paralyzed by the pool staring at his own reflection until his death. Named after this protagonist, the concept of narcissism has been studied by personality psychologists since the early 19th century (Freud, 1914). Today, the most popular measure used in the study of subclinical narcissism is the Narcissistic Personality Inventory (NPI) (Raskin & Hall, 1979). The NPI was developed based on the criteria for the clinical disorder, Narcissistic Personality Disorder (NPD), the criteria for which are outlined in the Diagnostic Statistical Manual (American Psychiatric Association, 2013). Although related, those diagnosed with NPD are not

considered to simply be at the extreme end of the narcissistic personality spectrum. Instead, it has been argued that NPD represents a dysfunctional version of narcissism (Miller & Campbell, 2008). Those in favor of this view note the many benefits conferred to those higher in narcissism; an example of which is that they are better able to handle negative feedback (Rhodewalt & Eddings, 2002).

In general, those high in narcissism exhibit a grandiose self-image that conflicts with reality. For example, those high in narcissism view themselves as more attractive (Gabriel, Critelli, & Ee, 1994), more knowledgeable (Paulhus, Harms, Bruce & Lysy, 2003), and more likeable (Grijalva & Zhang, 2016) than is reflective of reality. In a study examining overclaiming of knowledge, those with higher levels of narcissism rated themselves as familiar with fake terms at higher rates than those with lower levels of narcissism (Paulhus et al., 2003). In fact, even when participants were made aware that there were false items in the list, those with higher levels of narcissism still rated themselves as familiar with the fake terms. These findings illustrate that narcissists consider themselves to be better than reality would suggest.

Ultimately, narcissists are motivated to maintain their overly positive self-view and to have others evaluate them positively (Morf & Rhodewalt, 2001). Narcissists engage in self-regulatory strategies to maintain others' positive views of themselves (Morf & Rhodewalt, 2001). A series of studies examining the relationship between narcissism and performance found that narcissists performed better when there was an opportunity for self-enhancement compared to situations in which there was not such an opportunity; performance of those with lower levels of narcissism did not differ across situations (Wallace & Baumeister, 2002). In general, the self-regulatory strategies employed by narcissists tend to work, but only for a short period of time (Paulhus, 1998). Upon first meeting, those high in narcissism are seen as better than those that

are lower in narcissism (Paulhus, 1998). However, this effect reverses overtime such that those with lower levels of narcissism are seen as better. In such instances when their self-regulatory strategies fail, narcissists can become aggressive. In fact, narcissists react aggressively when they are socially rejected (Twenge & Campbell, 2003) or insulted (Bushman & Baumeister, 1998; Jones & Paulhus, 2010). Thus, narcissists are concerned with establishing and maintaining others' positive views of themselves and will become aggressive when this positive view is threatened.

Although intimately concerned with establishing a positive persona, narcissists are mainly concerned with their performance in agentic - but not communal - domains. Agentic concerns are inherently self-focused (e.g., power, dominance), whereas communality reflect concerns regarding getting along with others in one's group (e.g., agreeableness, warmth) (e.g., Bradlee & Emmons, 1992). Narcissists' bias towards agentic concerns is evidenced by the fact that narcissists are more likely to self-enhance in agentic domains, but not communal domains (Grijalva & Zhang, 2016). In fact, this is a key difference between narcissism and the related construct self-esteem. Specifically, in a series of studies narcissists rated themselves higher only in agentic domains, whereas those high in self-esteem rated themselves highly in both agentic and communal domains (Campbell, Rudich, & Sedikides, 2002). In the same study, narcissists rated communal traits as less important than agentic traits. In general, narcissism is negatively related to interdependent self-construal (i.e., view of the self as connected to others) and positively related to independent self-construal (i.e., view of the self as distinct from others) (Konrath, Bushman & Grove, 2009). In these ways, narcissists can be considered to be more self-focused than other-focused.

Narcissists' agentic focus affects their perception and quality of their relationships with others. Generally, narcissists do not view the quality of their relationships with others as particularly important. This is evidenced by findings that those high in narcissism have less need for intimacy (Carroll, 1987) and are more self-focused (Raskin & Shaw, 1988) than those lower in the trait. In romantic relationships, narcissists tend to engage more in game playing due to their need for power and autonomy (Campbell, Foster, & Finkel, 2002) and prefer partners that are themselves self-oriented, admiring of the narcissist, and facilitate self-enhancement via identification (i.e., by being with a "terrific" person the narcissist can also be seen as a "terrific" person) (Campbell, 1999). In general, narcissists view their relationships with others as avenues through which the narcissist can meet his/her needs (i.e., self-enhancement).

Despite their dispositional agentic bias, narcissists' focus can be shifted to more communal concerns. For example, those with higher levels of narcissism - as measured before the beginning of the study - had reduced levels of narcissism after being primed with interdependent self-construal (i.e., an emphasis on group membership) (Giacomin & Jordan, 2014). Narcissists also rated others as more deserving of help after an interdependent self-construal prime; this effect was mediated by a reduction in state narcissism resulting from the prime (Giacomin & Jordan, 2014). Another study examined the utility of perspective taking (i.e., considering a situation from another person's point of view) in reducing narcissists' self-focus. They found that although narcissists generally exhibit less empathy than non-narcissists, when they are forced to take the perspective of a target, those high in narcissism exhibited more empathic responses to a target individual (Hepper, Hart & Sedikides, 2014). Further, perspective taking resulted in increased autonomic arousal in narcissists' when presented with a narration of an individual's emotional breakup (Hepper et al., 2014). These findings suggest that although

narcissists are dispositionally more concerned with the self, their focus can be shifted to greater concern for others.

Findings that narcissists' myopic self and agentic focus can be altered are particularly important given the negative outcomes associated with narcissism for both the narcissist and those close to them. Specifically, narcissists exhibit relatively less concern for the outcomes of others in decision making tasks, instead focusing on obtaining the best outcome for themselves (Campbell, Bush, Brunell & Shelton, 2005). Although this tactic may result in a better overall outcome for the narcissist, it can be devastating for those affected by his/her decisions; this is especially true when the choices in the group/other's best interests are contrary to the choices in the narcissists' best interest (Campbell et al., 2005). Nevertheless, the negative effect of narcissistic decision-making is not limited to others close to the narcissist, as narcissists themselves can also make decisions contrary to their own best interest.

Narcissism has been associated with greater risk taking; behaviorally, narcissists gamble more frequently and spend more when they gamble (Lakey, Rose, Campbell & Goodie, 2008). This risk-taking propensity has been replicated in laboratory settings in which narcissists have been found to make riskier decisions on decision-making tasks (Brunell & Buelow, 2015). Investigations into this propensity have uncovered two main reasons for this increased risk taking: narcissists exhibit an approach motivation (Foster, Misra, & Reidy, 2009; Foster & Trimm, 2008) and are overconfident in their ability to obtain the reward (Campbell, Goodie & Foster, 2004; Lakey et al., 2008). Expressly, those high in narcissism evaluate the risk involved in a decision similarly to non-narcissists, but narcissists' exhibit greater sensitivity to the benefits associated with the risk (i.e., those higher in narcissism exhibit greater approach motivation)

(Foster, Shenesey, & Goff, 2009). This approach motivation then results in risky decision-making.

In addition to their focus on potential rewards associated with risky behavior, narcissists are also more confident that they will succeed in obtaining these rewards. In a study examining this tendency, participants completed computer based gambling tasks (Lakey, Campbell & Goodie, 2008). Results indicated that narcissists expected to do better on the task and this partially mediated the association between narcissism and risk taking (Lakey et al., 2008). This narcissistic overconfidence is based on their inflated self-ego which leads narcissists to overestimate their future and past ability regardless of objective feedback (Campbell, Goodie & Foster, 2004). Taken together, these findings indicate that narcissists' risky decision making is the result of their myopic focus on reward and overconfidence in their ability that is not based in reality. Further, because of their self-centered focus, they are unlikely to be concerned with the potential of negative consequences suffered by others, unless they are forced to consider the other's perspective.

1.4 MACHIAVELLIANISM

Machiavellianism is a personality construct created by Christie and Geis (1970) to reflect agreement with the philosophies espoused by political strategist Niccoló Machiavelli (1513/1981). In his book *The Prince*, Machiavelli argues for a "whatever means necessary" attitude for achieving success (Machiavelli, 1513/1981). In line with this, Christie and Geis (1970) conceptualized Machiavellians as amoral, cynical in worldview, and a willing to manipulate others to achieve their goals. Indeed, Machiavellianism has been associated with the view that moral values are relative, not absolute (Leary, Knight & Barnes, 1986). As an example, those high in Machiavellianism concern themselves with violations of intellectual

property rights when they have low - but not high - levels of computer expertise (Stylianou, Winter, Niu, Giacalone & Campbell, 2012). Essentially, when Machiavellians have the skill to commit the violation, they are less concerned with others committing it as well (Stylianou et al., 2012). In addition, after behaving unethically, those high in Machiavellianism report experiencing less guilt than those lower in Machiavellianism (Murphy, 2012). In all, Machiavellians are concerned with their success and are willing to skirt the bounds of traditional ethicality to achieve their goals.

In pursuit of their self-interest, Machiavellians express a relative disregard for the negative outcomes experienced by others resulting from their behavior. For example, Machiavellians exhibit greater willingness to violate reciprocity norms (Gunnthorsdottir, McCabe & Smith, 2002), violate the trust of a supervisor (Harrell & Hartnagel, 1976), and withhold information pertinent to the sale of an item (Sakalaki, Richardson, & Thepaut, 2007) in order to achieve the best outcome for themselves. Further, those high in Machiavellianism are less willing to engage in helping behaviors when such action would not directly benefit themselves. In businesses, Machiavellian employees are less likely to engage in organizational citizenship behaviors (i.e., behaviors that benefit the company generally, not one person specifically) unless others are around to view their behavior (Becker & O'Hair, 2007). They are also less likely to share knowledge with their co-workers, an action that would not benefit them directly, but is associated with benefits to the company as a whole (Liu, 2008). In an extreme example, those high in Machiavellianism were found to be less likely to assist others during an emergency (Wolfson, 1981). Generally, Machiavellians are unconcerned with the outcomes suffered by others, unless such concern would be self-beneficial.

In line with this self-interested focus, Machiavellians are less concerned with their relationships with others. Those high in Machiavellianism report their relationships are less important compared to those low in Machiavellianism (Lyons & Aitken, 2010). Instead, Machiavellians are more motivated by extrinsic rewards (e.g., financial success) compared to social concerns (e.g., the importance of family) (McHoskey, 1999). To achieve these extrinsic rewards, Machiavellians will engage in interpersonally manipulative tactics; essentially sacrificing communal values (i.e., getting along with others) in favor of agentic goals (i.e., getting ahead of others) (Jones & Paulhus, 2011a). Indeed, in their review of Machiavellianism, Fehr, Samson and Paulhus (1992) noted that Machiavellians will use a variety of manipulative tactics to achieve their goal including: lying, cheating, strategically self-disclosing information, and ingratiating themselves to others. Taken together, these findings support the self-interested manipulation assumed to be characteristic of Machiavellians (Christie & Geis, 1970).

Another characteristic feature of Machiavellianism is a cynical worldview (Christie & Geis, 1970). Although they will engage in duplicitous tactics to meet their ends, those high in Machiavellianism expect that others would behave in similar ways to themselves. In a study examining trust in economic partnerships, those high in Machiavellianism reported less trust in their partner and cited their partners' perceived selfishness as the reason for this lack of trust (Sakalaki et al., 2007). In another study, Machiavellians were found to be more likely to punish someone who stole for them when the person exhibited remorse compared to when the thief did not express remorse (Harrell, 1980). In fact, Machiavellians indicated distrust in the sincerity of the remorse expressed by the person who stole from them (Harrell, 1980). In this way, Machiavellians can be considered to think of distrust and selfishness as the norm, leading them question the sincerity of trusting and selfless acts.

Although the tactics employed by Machiavellians may be considered ethically questionable, they are often successful. In financial decision paradigms involving another person or people, those higher in Machiavellianism end up with more money at the end of the game (e.g., Bereczkei & Czibor, 2014; Czibor, Vincze & Bereczkei, 2014; Spitzer, Fischbacher, Hernberger, Gron & Fehr, 2007). Further, Machiavellian employees outperform non-Machiavellian employees when working in a more loosely structured workplace that allows for flexibility (Gable, Hollon, Dangello, 1992; Shultz, 1993). Among salespeople, Machiavellianism is associated with higher sales (Ricks & Fraedrich, 1999). Perhaps most startling, a study examining profiles of United States Presidents found that higher scores of Machiavellianism were associated with more charismatic leadership and better presidential performance (Deluga, 2001). Nevertheless, Machiavellianism is not beneficial in all situations. For example, although Machiavellian salespeople have been found to have higher sales, they also had worse supervisor evaluations (Ricks & Fraedrich, 1999). In these ways, researchers construe Machiavellianism as an adaptive trade-off. Specifically, the trait confers some competitive advantages in certain situations, but not in *every* situation (e.g., Jones, 2016).

In an attempt to explain the success of Machiavellians' manipulative tactics, some have proposed an association between Machiavellianism and Theory of Mind (ToM) (McIlwain, 2003). The argument is that those who are better able to understand the intentions, beliefs, and knowledge of others (i.e., those with greater ToM) would also be better able to manipulate others (McIlwain, 2003). Investigations into this relationship, however, have found no significant association between Machiavellianism and ToM (Paal & Bereczkei, 2007) or small negative correlations with ToM (Ali & Chamorro-Premuzic, 2010; Lyons, Caldwell & Shultz, 2010). The only area related to ToM in which Machiavellians have been found to perform better than non-

Machiavellians is in the recognition of others' negative emotions (Bagozzi et al., 2013). Similar attempts to associate Machiavellianism with greater intelligence (O'Boyle, Forsyth, Banks & Story, 2013) have also failed to find a relationship. Thus, the success of Machiavellians cannot be attributed to differences in mind-reading ability or intelligence, emotional or otherwise.

More recently, researchers have proposed that the effectiveness of Machiavellian strategies is due to their ability to adapt their responses to the constraints of their social environment (Bereczkei, Deak, Papp, Perlaki & Orsi, 2013). Support for this view comes from findings that Machiavellians behave differently depending on punishment/reward contingencies. For example, those high in Machiavellianism are less likely to make charitable or helping offers when such offers are made anonymously; when offers are made publicly those high in Machiavellianism do not differ from those low in the trait in terms of offers (Bereczkei, Birkas & Kerekes, 2007; Bereczkei, Birkas & Kerekes, 2010). The addition of the publicity of the offers of help changes the reward/cost contingency insofar as offers of help/charity might lead to increased social reputation (Bereczkei et al., 2007; Bereczkei et al., 2010). In a study examining financial decision making, participants were given an amount of money and had to decide how much to keep and how much to give their partner (Spitzer et al., 2007). When the partner was unable to punish them, those high in Machiavellianism offered significantly less to their partner (Spitzer et al., 2007). However, when the possibility of punishment was introduced, Machiavellians offered significantly more than they had when punishment was not possible (Spitzer et al., 2007). Additional studies have found that Machiavellians moderate the amount they contribute to others based on the behavior of their partners (Bereczkei & Czibor, 2014; Czibor & Bereczkei, 2012). Findings such as these offer support for the view that

Machiavellians are sensitive to their environment and will adapt their behavior in order to achieve the best outcome based on environmental constraints.

The cognitive mechanism(s) that allows those high in Machiavellianism to adapt to their environment is still subject of some debate. One possible explanation is that those high in Machiavellianism are more motivated to explore the mental states of others (i.e., spontaneous mentalization) (Bereczkei, 2015). Indeed, researchers have found that individuals' level of Machiavellianism is associated with the spontaneous generation of mental states of others (Esperger & Bereczkei, 2011). However, despite this apparent tendency to explore others mental states, Machiavellians are able to emotionally detach during the decision making process (Bereczkei, 2015). A study examining this emotional detachment had participants decide how much money to give to the group, versus keep for themselves (Czibor, Vincze & Bereczkei, 2014). After making their decision, individuals wrote about their decision making process (Czibor et al., 2014). Machiavellians used more verbs related to cognitive - not emotional - concerns (Czibor et al., 2014). Finally, it is possible Machiavellians' adaptability is due to their focus on potential social risks. This assertion is supported by findings that Machiavellians attend to negative facial features of others (Bagozzi et al., 2013) and regions of the brain associated with attending to social risk are more active in Machiavellians during decision making tasks (Spitzer et al., 2007). Although preliminary research seems to support each of these mechanisms as important in the adaptiveness of Machiavellianism, additional research is needed to determine a causal link. Nevertheless, it is clear that Machiavellians possess skills that allow them to effectively adapt to their environment. These studies suggest that Machiavellians are willing to engage in risky behavior when they will not suffer the consequences of their actions.

1.5 The Dark Triad

The personality traits discussed above were studied in relative isolation until the publication of an article by Paulhus and Williams (2002) that provided evidence that the traits are overlapping, yet distinct constructs. Prior to their publication, there were few studies that empirically compared the traits. The few existing studies that compared at least two of the three traits, found moderate, positive correlations between them, indicating some degree of trait overlap (Gustafson & Ritzer, 1995; McHoskey, 1995; McHoskey, Worzel, & Szyarto, 1998). However, the degree of overlap and distinctiveness of the traits was subject of some debate; some researchers - most notably McHoskey and colleagues - argued that at least some of the traits were reflective of one underlying construct. Specifically, McHoskey and colleagues argued that Machiavellianism is a subclinical form of psychopathy (McHoskey, Worzel & Szyarto, 1998).

In an effort to establish whether the traits were distinct or representative of a single underlying construct Paulhus and Williams (2002) examined the correlations between traits, as well as the correlation of each with intelligence, other personalities and self-enhancement. They found that the traits shared modest positive correlations with each other (*r*'s between .25 and .50) suggesting some trait overlap. However, each showed a different pattern of association with the Big Five traits. For example, Machiavellianism was associated with unconscientiousness and disagreeableness whereas narcissism was associated with extraversion, openness, and disagreeableness. The traits converged however, insofar as each was associated with disagreeableness. Furthermore, only narcissism was positively correlated with overall IQ; psychopathy and Machiavellianism were instead associated with greater nonverbal compared to verbal IQ. Finally, narcissism - but not Machiavellianism or psychopathy - was correlated with

self-enhancement. These results suggested that although the traits overlap, they are distinct constructs.

Later studies have confirmed the moderate correlations between Machiavellianism, psychopathy, and narcissism (e.g., Rauthmann, 2012; Vernon, Villani, Vickers & Harris, 2008). Additionally, studies have established unique behavioral outcomes of each trait (e.g., Jones & Olderbak, 2013). Despite the evidence that these traits represent different underlying constructs, some continue to argue that the Dark Triad traits is best represented a unitary construct. Recent unificationist perspectives have used evolutionary psychology and personality trait psychology research to argue for these traits represent a unitary construct.

Historically, evolutionary psychologists have argued that malevolent traits can be considered to reflect a single construct insofar as they all represent a similar, evolved adaptation for short-term exploitation (Mealy, 1995; Wilson, Near, & Miller, 1996). In this vein, some have argued for the unification of the Dark Triad insofar as they all reflect a socially exploitative style (e.g., Jonason, Koenig & Tost, 2010). Supporting this view are findings that the traits are each associated with a fast life-history strategy (i.e., more effort allocated to reproductive effort), short-term mating in men and sex differences in levels of the Dark Triad[3] (Jonason et al., 2010; Jonason, Li, Webster & Schmitt, 2009). However, when the relationship between the Dark Triad traits and life history strategies was explicitly tested, only psychopathy was correlated with a fast life history strategy (Jonason et al., 2010). Further, subsequent investigations have found unique associations between Dark Triad traits and sexual coercion (Jones & Olderbak, 2013) as well as infidelity (Jones & Weiser, 2014). Thus, although all three traits might use a socially

[3] A number of studies have found that the men have higher scores than women on measures of the dark triad, but both genders display similar patterns of association with external variables (e.g., Paulhus & Williams, 2002). Arguing from an evolutionary perspective that women have more "at stake" for reproductive activities that women would show less of a fast life history strategy.

exploitative style, the specific style and the consequences therein are different for each personality trait. Therefore, one cannot assume that those high in these traits will behave uniformly in every situation, thereby supporting the importance of examining all three of these traits in future studies.

Unification arguments based on personality trait research have focused on the relationship between the Dark Triad traits and big five traits, as well as the location of the Dark Triad within the interpersonal circumplex. Studies that have examined the relationship between the Dark Triad and big five traits have consistently found a negative correlation between each of the three traits and agreeableness (e.g., O'Boyle, Forsyth, Banks, Story & White, 2014). Additionally, those that have attempted to locate the Dark Triad within the interpersonal circumplex[4] have found that all three traits are characterized by low levels of communion or getting along, as well as high levels of agency or getting ahead (Jones & Paulhus, 2011a). Based on these findings researchers have variously argued that the Dark Triad simply represents the inverse of agreeableness (Jakobwitz & Egan, 2006) or the location in personality space of high-agency and low-communion (Rauthmann & Kolar, 2012).

Though these assertions are based on well replicated findings, they fail to consider the plethora of research indicating the traits practically diverge insofar as the behaviors each uniquely predicts. For example, studies have found unique associations between the traits insofar as predicting aggression (Jones & Paulhus, 2010; Pabian, De Backer & Vandebosch, 2015), financial risk acceptance (Jones, 2013; Jones, 2014), impulsivity (Jones & Paulhus, 2011b), infidelity (Jones & Weiser, 2014), prejudice (Jones, 2013), scholastic cheating (Nathanson, Paulhus & Williams, 2006), and deviant sexual behavior (Williams, Cooper,

[4] The Interpersonal circumplex defines personality on two axes, agency (getting ahead) and communion (getting along) (Wiggins, 1979).

Howell, Yuille & Paulhus, 2009), to name a few. Thus, although one may argue the overlap between Dark Triad traits is disagreeableness or high-agency and low-communion, one cannot discount the unique variance associated with each trait; to do so would be to assume the prediction and understanding of the aforementioned behaviors is unimportant. Instead, the goal of the study of the Dark Triad should be to explicate the nature of the overlap between the traits, the outcomes associated with this overlap, as well as the manner in which the Dark Triad diverge and the unique associations of each trait.

Several perspectives have emerged in the past decade regarding the nature of the overlap between the Dark Triad traits. Adopting an evolutionary perspective, Jonason and his colleagues have argued that the Dark Triad is reflective of a socially exploitative style exemplified by a fast life history-strategy (Jonason et al., 2010). This perspective has proven difficult to assess, however, due to its lack of specificity as well as contrary correlations. In contrast, others have submitted that the overlap between the traits is the inverse of the agreeableness factor (i.e., disagreeableness) of the big five (Jakobwitz & Egan, 2006). This association between Dark Triad traits and disagreeableness is well-replicated and robust; a recent meta-analysis examined this relationship and found *r*'s between -.36 and -.53 for the relationship between each trait and agreeableness (O'Boyle et al., 2014).

A new factor model has recently been proposed to represent differences in individual personality traits better than the big five, based on lexical investigations in multiple languages (Lee & Ashton, 2004). The new factor model includes the original big five traits as well as a sixth factor termed honesty-humility; the new six factor model is referred to as the HEXACO model (Lee & Ashton, 2004). Investigations into the association between the Dark Triad traits and HEXACO dimensions have found that the traits are more strongly associated with a lack of

honesty-humility than with disagreeableness (Lee & Ashton, 2005; Lee & Ashton, 2014). Furthermore, the Dark Triad traits and a lack of honesty-humility predict similar outcomes such as short-term mating, desire for power, and materialism; these outcomes were not predicted by a lack of agreeableness (Lee et al., 2014). Most recently, Jones and Figuredo (2013) conducted a series of factor analyses and found that the overlap between traits is best represented as callousness and manipulation. Regarding the association with the HEXACO model, they argue although the lack of honesty-humility reflects some of the overlap between traits it misses the callousness that is common between these traits (Jones & Figuredo, 2013). Indeed, other studies have supported that the Dark Triad traits are associated with a lack of empathy (Wai & Tilipoulos, 2012). At this time the best evidence suggests that the "core" of the Dark Triad is callous-manipulation.

Since the publication of Paulhus and Williams' (2002) seminal article, a plethora of studies have been published attempting to establish the nature of the divergence between the traits. The available studies suggest Machiavellianism is a strategic form of callous-manipulation, whereas psychopathy and narcissism reflect reckless and grandiose callous-manipulation, respectively. The reckless nature of psychopathy is supported by findings that psychopathy is uniquely associated with dysfunctional impulsivity (Jones & Paulhus, 2011b), riskier forms of academic dishonesty (Williams, Nathanson & Paulhus, 2010), and risking other's money in the face of almost certain loss (Jones, 2013). In contrast, Machiavellians will engage in strategic forms of deviant behavior as exemplified by findings that Machiavellianism alone is not associated with any form of impulsivity (Jones & Paulhus 2011) and that Machiavellians will engage in academic cheating when the risk of detection is minimal (Williams et al., 2010). Finally, the grandiose nature of narcissists is evidenced by the finding

that narcissists alone will aggress in response to ego-threat, but not physical threat (Jones & Paulhus, 2010). As can be seen a number of studies have established that the Dark Triad traits are each associated with unique outcomes. Thus, one cannot assume that a finding for one of these personality traits will necessarily generalize to another. Therefore, studies that are interested in the effect of interpersonally manipulative personalities should examine all three of these traits to establish the overlap and divergence insofar as whet they predict.

1.6 Summary and Present Study

Findings from studies examining decision making for the self and others suggest differences in the cognitive processes involved in risky choices due to differences in individual's emotional reactions to consequences affecting the self and others (e.g., Kray, 2000; Loewenstein et al., 2001). Specifically, less emotional reactivity to decisions involving consequences for others has been proposed to explain findings that individuals are relatively more risk tolerant when making decisions for others (e.g., Polman, 2012). However, the specific consequences of self-other reward asymmetries have yet to been fully examined. Additionally, the effect of dispositionally selfish personalities on differences in self and other decision-making is yet to be established (see Table 1 for a summary of the differences between the Dark Triad traits for decision making and relationships with others). This is particularly problematic as individuals high in dark personality traits – which are characterized by low empathy, interpersonal manipulation, and selfishness – are especially unlikely to be emotionally reactive to consequences suffered by others (Jones & Figuredo, 2013). Thus, individuals are generally more likely to engage in risky behavior when others will suffer the consequences and this tendency is likely to be moderated by dispositional characteristics.

Table 1: Summary of Differences in Dark Triad Characteristics

	Machiavellianism	Psychopathy	Narcissism
Decision Making Style	Flexible strategy, able to consider long-term consequences	Focus attention on goal/reward to exclusion of noticing punishment cues	Overconfident in abilities, greater sensitivity to reward
Relationship with others	Cynical worldview, use others before they use me	Willing to harm close others to obtain a reward	Self-centered orientation, view others as useful only as much as they reflect positively on the self

Another moderator of risk taking when the self or others will suffer the consequences is interpersonal closeness. Expressly, one's emotional reactions to risky decisions are likely to vary as a function of how close the other is perceived to be to the self (Hsee & Weber, 1997). Indeed, studies have shown that individuals engage in less risk taking behavior when close – rather than distant – others will suffer the consequences (Trump, Finkelstein & Connell, 2014). Nevertheless, those high in dark personality traits Machiavellianism and psychopathy are unlikely to be affected by interpersonal closeness due to their cynical worldview and attentional deficits respectively. However, as previous studies have found the effect of narcissism is dampened when a communal orientation is primed, interpersonal closeness might mediate the risk-tolerance of those high in narcissism when making decisions for others (Giacomin & Jordan, 2014).

In this study, the effect of self and other reward asymmetries, as well as interpersonally manipulative personality traits, on self and other decision-making was examined. Interpersonal closeness was also examined as a potential moderator affecting decision making for oneself versus others. To this end, participants were tasked with making investment decisions for themselves or another person under three reward contingencies (1) other reward only, (2) self-

reward and other reward asymmetry, and (3) self-reward only. The order of the first two contingencies was randomized. Prior to the investment task, individuals either engaged in a bonding or neutral activity with their "client" in order to manipulate the perceived closeness of the individual with the "client." Further, participants' levels of Dark Triad personality traits were assessed in order to determine the effect of these traits on decision making for others compared to the self, as well as the potential effect of interpersonal closeness, on these decisions. Seven hypotheses were examined for this study:

H1: Individuals will make riskier decisions for the other person when there are self-reward and other-reward asymmetries compared to when there are only other-rewards or self-rewards.

H2: Individuals who did not bond with the other person will make riskier decisions for the other person in the other-reward and self- and other-reward asymmetry conditions compared to those who did bond with the other person.

H3: Individuals who complete the self- and other-reward asymmetry condition first will anchor their subsequent decision in the other-reward only condition to their decision in the self- and other-reward asymmetry condition.

H4: Individuals higher in narcissism will make riskier decisions for others in the other-reward and self- and other-reward asymmetry conditions.

H5: Those higher in narcissism who have bonded with the other person will make less risky decisions for the other person in the other-reward and self- and other-reward asymmetry conditions than those higher in narcissism who did not bond with their partner.

H6: Individuals higher in psychopathy will make riskier decisions for others in the other-reward and self- and other-reward asymmetry conditions regardless of whether they have bonded with the other person.

H7: Individuals higher in Machiavellianism will make riskier decisions for others in the other-reward and self- and other-reward asymmetry conditions regardless of whether they have bonded with the other person.

Chapter 2: Method

2.1 Power Analysis

A power analysis was conducted using the statistical software G*Power (Faul, Erdfelder, Buchner & Lang, 2009). Previous studies have found about a medium effect of empathy (Faro & Rottenstreich, 2006) as well as interpersonal closeness (Livitan, Trope & Liberman, 2008) on decision making for others. Additionally, a previous study utilizing the bonding manipulation used in this study found a medium sized relationship between bonding and perceived closeness. As such, I estimated a medium effect size (f^2 = 0.15). The analysis indicated that to conduct a linear regression with seven independent variables, 103 participants would be needed to have an 80% chance of detecting a medium effect should one exist in the population.

I also calculated the number of participants needed to compare the differences between conditions using a repeated measure ANOVA with two between-subjects variables (i.e., bonding and order of conditions). This analysis indicated that 68 participants were needed to have an 80% chance of detecting a medium effect should one exist in the population.

2.2 Participants

A total of 160 participants were recruited from a medium sized university in the southwest of the United State of America. Four participants were deleted from subsequent analyses due to their prior relationship with their partner for the study; two participants were in a romantic relationship and two participants knew each other since high school. Additionally, 28 participants were removed from subsequent analysis because they failed an attention-check. Finally, one participant was excluded due to computer malfunction during data collection. This resulted in a final sample size of 127 participants (63% female; 85% Hispanic; M_{age} = 20.92; SD_{age} = 4.528).

2.3 MATERIALS

2.3.1 Investment Game

This activity consisted of "game board" and two stacks of eleven, 3"x5" note cards labeled hard or easy. On the back of the note card were business questions with varying degrees of difficulty depending on whether they are a hard or easy question. The game board was a black poster board with eleven blocks - approximately 3"x5" - numbered 2 through 12. Each space had a 2"x2" green piece of paper adhered to the center with the shade of green indicating the probability of a roll of two dice resulting in the number corresponding to the space (e.g., 2, 3, and 4). The darker green squares were placed on the spaces corresponding to the more likely dice rolls (e.g., 7) whereas the lighter green squares were placed on the spaces corresponding to the less likely dice rolls (e.g., 2 or 12).

2.3.2 Bonding Activity

Participants were randomly assigned to answer a series of increasingly personal questions or take turns reading *A Winter's Tale* (Shakespeare, n.d.).

2.4 MEASURES

The means and standard deviations of all measures are reported in Table 2.

Table 2: Means and Standard Deviations of Self-Report Measures

Measure	Mean	Standard Deviation
SRP-SF	2.016	0.573
NPI-13	0.292	0.212
Mach-IV	2.604	0.467
EQ	2.285	0.265
ONS	0.710	0.208
SNS	3.850	1.082

2.4.1 Psychopathy

The short form of the Self-Report Psychopathy scale (SRP-SF) (α = 0.912) was used to measure subclinical psychopathy (Paulhus, Neumann, & Hare, *in press*). The SRP-SF consists of four inter-correlated lower-order factors (i.e., interpersonal manipulation, callous affect, erratic lifestyle, and antisocial behavior) with a higher order factor of psychopathy. The composite score of psychopathy was used in this study. The SRP-SF has participants rate their agreement with items on a 5-point Likert-type scale (e.g., "I have been arrested").

2.4.2 Narcissism

The thirteen item Narcissistic Personality Inventory (NPI-13) (α = 0.736) was used to measure narcissism (see Appendix A; Gentile et al., 2013). This scale has participants choose between a narcissistic statement and a non-narcissistic statement (e.g., "I like to look at my body" or "My body is nothing special").

2.4.3 Machiavellianism

The Mach-IV (α = 0.753) was used to measure Machiavellianism (see Appendix B; Christie & Geis, 1970). This is a 20-item measure that has participants rate their agreement with items on a 5-point Likert-type scale (e.g., "It is wise to flatter important people").

2.4.4 Empathy

The 40-item Empathy Quotient (EQ) (α = 0.758) questionnaire was used to measure participants' empathy (see Appendix C; Baron-Cohen & Wheelwright, 2004). This scale has participants rate their agreement with a series of statements on a 1(*Strongly Agree*) to 4(*Strongly Disagree*) Likert-type scale (e.g., "I can easily tell if someone else wants to enter a conversation"). This questionnaire also includes 20 non-target items to obfuscate the true purpose of the questionnaire.

2.4.5 Subjective Numeracy

The Subjective Numeracy Scale (SNS) (α = 0.843) was administered to measure participants' numeracy (see Appendix D; Fagerlin et al., 2007). Numeracy was measured in order to control for its effect on risky choices; previous studies have suggested that numerical skills are significantly related to performance on measures of risk (Dave, Eckel, Johnson & Rojas, 2010). This scale consists of eight questions in total; four of the questions measuring self-reported ability to perform mathematical tasks (e.g., "How good are you at working with fractions?") and four measuring participants' preference for the presentation of statistical information (e.g., "How often do you find numerical information to be useful?").

2.4.6 Objective Numeracy

An objective measure of numeracy was also administered in order to assess participants' actual numeracy (α = 0.728) (see Appendix E; Lipkus, Samsa & Rimer, 2001). Although the subjective numeracy scale correlates well with this measure administration of both measures allowed us to account for participants' overconfidence in their numeracy ability, as well as their actual numeracy ability. This is especially relevant in the measure of narcissism, as those higher in narcissism tend to overclaim their knowledge (Paulhus, Harms, Bruce & Lysy, 2003).

2.4.7 Interpersonal Closeness

All participants completed the Inclusion of Other in Self (IOS) scale in order to verify that the bonding manipulation resulted in increased interpersonal closeness (see Appendix F; Aron, Aron & Smollan, 1992). This measure includes seven Venn diagrams with varying degrees of overlap; participants indicate their perceived closeness with another by indicating the Venn diagram most representative of their relationship with the other person.

2.5 PROCEDURES

Three participants were recruited for each lab session. Two of the participants were assigned to participate in the study, whereas the other participant completed several online tasks for a separate study. If one of the participants did not show up at the start of the experiment, the other two participants were told they would start the study and one of the researchers would wait for the third participant and start them through the study once s/he showed up.

The two participants assigned to complete the study were brought to an experimental room at which point they were given one of two packets by the researcher. Inside the packet was either a bonding activity or a neutral activity. Participants assigned to the bonding activity answered a series of increasingly personal questions; this has been shown to increase the inclusion of the "other" in one's self-concept in previous studies (Benavidez, Neria & Jones, 2016. Participants also circled each question they completed during the bonding activity. Those assigned to the neutral activity took take turns reading Shakespeare's *A Winter's Tale* (Shakespeare, n.d.); previous studies have found that this activity does not increase self-other concept overlap (Benavidez et al., 2016). Further, Arthur Aron (November, 2012) indicated a neutral activity should be included that does not involve asking questions.

The activity packets were approximately the same weight and were the same size and color. The researcher was blind to which packet contained each activity and randomly handed the participants one of the packets. Once participants' were given one of the packets by the researcher, they instructed the participants to complete the activity in the packet, following the directions outlined on the first page. The researcher then left the experimental room in order to remain blind to the participants' assigned condition. Upon leaving the room, the researcher set a timer for 15 minutes on his/her phone. At the conclusion of the 15 minutes, the researcher returned to the room and instructed participants that the activity was finished and the participants

would be separated for the remainder of the study. The researcher emphasized that the two participants would not be interacting with each other again during the study.

At this point in the study, one of the participants was taken to a separate experimental room by a researcher. Once alone, both participants were told that they would be completing an investment game and that they had been assigned the role of the broker and their partner they completed the activity with had been assigned the role of the investor (i.e., they both were told that they were the broker and the other participant was the investor).

Each participant was then presented with the materials for an "Investment Scenario": game board and two stacks of questions labeled easy or hard. Participants were asked a hard and easy question in order for them to gauge the difficulty of each question. Additionally, participants were told that the hard questions were unlikely to be answered by most anyone, whereas even minimal knowledge of business would likely result in a correct response to an easy question. They were then given a sheet with the instructions for the "Investment Scenario" (see Appendix G) for them to read while the researcher explained the scenario.

The research explained that the participant was tasked with setting up the game board with one question on each space on the board. Once a question was placed on each board space, the participant was told they would roll two dice. It was explained that the question on the board space corresponding with the dice roll would be asked to the third participant (i.e., not their client who they completed the activity with) at the end of all the rounds of the scenario. The outcome for the broker/investor would then depend on whether the third participant correctly answered the selected question within 20 seconds of the question being asked. The third participant was chosen to answer the questions in order to reduce the effect of overconfidence on participants' decisions. This was deemed necessary as those higher in narcissism have been

shown to engage in greater risk taking due to their overconfidence (Lakey et al., 2008). Additionally, each participant answered two questions assessing their confidence that the third participant would answer a hard/easy question correctly – after the instructions of the scenario were explained – so that the effect of confidence on participants' decisions could be examined.

After assessing participants' confidence, the research explained that not every board space was equally likely to be selected from a roll of two dice. The researcher then provided participants with a sheet listing the probability of a roll of two dice resulting in each number corresponding with each board space. The meaning of the green squares on the board spaces was also explained to the participant by the researcher. Specifically, the participant was told that darker green squares corresponded to more likely dice rolls, whereas the lighter green squares corresponded to less likely dice rolls. Finally, participants were given the chance to practice the "Investment Scenario" in two practice rounds. The researcher emphasized these practice rounds would not affect the participant or the participant's partner and was simply for the participant to gain some experience with the scenario.

After the two practice rounds, the participant completed the "Investment Scenario" under three conditions: (a) other-reward only, (b) self-reward versus other-reward and (c) self-reward only. The order of the first two conditions was randomized, however, the self-reward only condition was always the last condition completed by participants. The order of the self-reward condition was not randomized because previous studies have found that individuals asked to make decisions for themselves first, anchor subsequent responses for others to their decision for themselves (Faro & Rottenstreich, 2006). In each condition the broker and/or investor was given the opportunity to earn entries into a raffle for three prizes of $50 at the end of the semester.

The self-reward versus other reward condition was randomized with the other-reward only condition, despite this condition involving participants making a decision involving themselves, because this is the first study with such a condition. Therefore, it was unknown whether participants would anchor future decisions to the decisions made in the self-reward versus other reward condition. Additionally, this randomization process allowed us to examine order effects.

Prior to each condition, the researcher gave the participant a sheet delineating the reward structure of the condition (see Appendix H), for the participant to review while the researcher explained the reward structure. Afterwards, the researcher administered a four-question comprehension check in order to ensure the participant understood the reward structure for each condition. The researcher asked the participant these questions verbally, noting the accuracy of the participant's response, and providing the participant with feedback on their accuracy. In cases in which the participant answered a question incorrectly, the researcher explained the correct answer.

In condition 'A', the broker was told the client was being given 12 raffle entries into a raffle for three prizes of $50 to invest. The researcher explained that if the question corresponding to the dice roll was answered correctly by the third participant the client would earn an additional 6 raffle entries if the question was easy or 12 if the question was hard. However, the participant was also told that if the third participant answered a question incorrectly, the client would lose all 12 of his/her raffle entries regardless of the difficulty of the question. In this condition, the less risky choice for the client was to set up the board with easy rather than hard questions.

In condition 'B', the broker was told the client was being given 12 raffle entries into a raffle for three prizes of $50 to invest. Again, the researcher explained that if the third participant answered the question correctly, the client would earn an additional 6 raffle entries if the question was easy or an additional 12 raffle entries if it was a hard question. Yet, if the question was answered incorrectly the client would lose all 12 raffle entries. The difference between conditions 'A' and 'B' was that in condition 'B' the broker was told s/he would earn one raffle entry for every easy question on the board and two raffle entries for every hard question on the board, regardless of whether the question is answered correctly. In this condition, the client benefited from the board being set up with easy rather than hard questions, whereas the broker benefited from the board being set up with hard rather than easy questions.

In condition 'C', the broker was told they were being given 12 raffle entries into a raffle for three prizes of $50 to invest. They were told that they would be rewarded the way their client was in the previous rounds. Specifically, participants were told that if the third participant answered the question correctly, the participant would earn an additional 6 raffle entries for easy question or an additional 12 raffle entries for a hard question. Again, however, if the question was answered incorrectly they would lose all 12 of their raffle entries. In this condition, the broker benefits from the board being set up with easy rather than hard questions.

Upon completing the three conditions, the participant was taken to one of three computers in the hallway of the experimental suite. Tri-fold cardboard posters were placed vertically between the computers to separate the participants. The participant then completed a survey on the online survey platform *Qualtrics*. First, the participant completed the Dark Triad personality measures (i.e., SRP-SF, NPI-13, and Mach-IV), a measure of subjective numeracy (i.e., SNS), and a measure of empathy (i.e., EQ) in a randomized order. Participants then

completed a measure of objective numeracy; they were provided a calculator, pen, and piece of paper to use if they needed.

After completing the objective numeracy questionnaire, participants completed the interpersonal closeness measure (i.e., IOS) as well as several questions including: (a) their perception of the likelihood of themselves/their client winning the raffle (0% - 100%), (b) their perception of the importance of the raffle money to their partner on a 7-poing Likert-type scale from 1(*Not at all Important*) to 7(*Extremely Important*), (c) the importance of the raffle money to themselves on a 7-poing Likert-type scale from 1(*Not at all Important*) to 7(*Extremely Important*), (d) whether they were award they were playing for raffle entries for an actual raffle, I whether they knew their client before the study, and (f) whether they heard anything about the study before participating. Finally, participants completed demographics questions, were debriefed, and thanked for their participation.

Chapter 3: Results

3.1 Bonding Manipulation Checks

In order to verify that the bonding manipulation used in this study was effective, I compared participants' self-rated closeness to their partner (i.e., IOS scores) for those assigned to the bonding condition (n = 60) to those assigned to the neutral condition (n = 66). This analysis indicated that participants assigned to the bonding condition (M = 3.48; SD = 1.93) reported themselves as being closer to their partner than those assigned to the neutral condition (M = 2.12; SD = 1.45), $\chi^2(6) = 21.957$, $p < 0.001$, $d = 0.80$.

The effect of the number of questions completed by participants in the bonding condition on perceived closeness was also examined using a one-way ANOVA. These results indicated that the number of questions completed by participants did not significantly affect participants' perceived closeness to their partner, $F(6, 27) = 0.614$, $p = 0.717$.

3.2 Indices of Board Difficulty

Twelve indices of board difficulty were created to examine differences in decision-making within and across conditions (Table 3).

Table 3: Description of Dependent Variables

Dependent Variable	Description
No. Hard Cards A	# of hard cards on the investment board in condition A
No. Hard Cards B	# of hard cards on the investment board in condition B
No. Hard Cards C	# of hard cards on the investment board in condition C
Board Difficulty A	The sum of the probability of each board space with a hard card on the investment board in condition A being selected
Board Difficulty B	The sum of the probability of each board space with a hard card on the investment board in condition B being selected
Board Difficulty C	The sum of the probability of each board space with a hard card on the investment board in condition C being selected
No. Hard Cards A to C	# of hard cards on the investment board in condition A minus # of hard cards on the investment board in condition C (*positive numbers indicate greater difficulty in condition A compared to condition C*)
No. Hard Cards A to B	# of hard cards on the investment board in condition A minus # of hard cards on the investment board in condition B (*positive numbers indicate greater difficulty in condition A compared to condition B*)
No. Hard Cards B to C	# of hard cards on the investment board in condition B minus # of hard cards on the investment board in condition C (*positive numbers indicate greater difficulty in condition B compared to condition C*)
Board Difficulty A to C	The sum of the probability of each board space with a hard card on the investment board in condition A being selected minus the sum of the probability of each board space with a hard card on the investment board in condition C being selected (*positive numbers indicate greater difficulty in condition A compared to condition C*)
Board Difficulty A to B	The sum of the probability of each board space with a hard card on the investment board in condition A being selected minus the sum of the probability of each board space with a hard card on the investment board in condition C being selected (*positive numbers indicate greater difficulty in condition A compared to condition B*)
Board Difficulty B to C	The sum of the probability of each board space with a hard card on the investment board in condition A being selected minus the sum of the probability of each board space with a hard card on the investment board in condition C being selected (*positive numbers indicate greater difficulty in condition B compared to condition C*)

First, the number of hard cards placed on the board for each condition was examined. These variables represent the number of hard cards the participant placed on the investment board in each condition: *No. Hard Cards A*, *No. Hard Cards B.*, and *No. Hard Cards C*.

As individuals might have considered the likelihood of each space on the board being selected when setting up the board, I also examined the difficulty of the card placed on each space in conjunction with the probability of the board space being selected. Specifically, I multiplied the probability of each board space being selected by the difficulty of the card placed on the space (e.g., 1 for hard cards and 0 for easy cards). These variables therefore represented the sum of the probability of each board space on which the participant placed a hard card being selected: *Board Difficulty A*, *Board Difficulty B*, and *Board Difficulty C*.

Additionally, I wanted to examine the difference in board difficulties between conditions; for example, whether the participant made the board more difficult (i.e., placed more hard cards) when s/he would benefit from greater board difficulty than when s/he would benefit from less board difficulty. Therefore, I first created variables to examine the difference between the numbers of hard cards placed on the board in each condition. These variables were created by subtracting the number of hard cards placed on the board by the participant in condition X from the number of hard cards placed on the board by the participant in condition Y: *No. Hard Cards A to C*, *No. Hard Cards A to B*, and *No. Hard Cards B to C*. I also examined the difference in the difficulty of the boards between conditions. These variables were created by subtracting the difficulty of the investment board created by the participant in condition X from the difficulty of the investment board created by the participant in condition Y: *Board Difficulty A to C*, *Board Difficulty A to B*, and *Board Difficulty B to C*. The means, standard deviations, minimums and maximums of these variables are reported in Table 4.

Table 4: Descriptive Statistics of Dependent Variables

Measure	Mean	SD	Minimum	Maximum
No. Hard A	3.056	2.274	0.000	11.000
No. Hard B	4.260	2.561	0.000	11.000
No. Hard C	2.607	2.455	0.000	11.000
Board Difficulty A	0.210	0.218	0.000	1.010
Board Difficulty B	0.303	0.242	0.000	0.900
Board Difficulty C	0.172	0.226	0.000	1.010
No. Hard Cards A to C	0.426	2.739	-11.000	11.000
No. Hard Cards A to B	-1.198	2.977	-11.000	11.000
No. Hard Cards B to C	1.672	3.197	-8.000	11.000
Board Difficulty A to C	0.426	2.739	-1.010	1.010
Board Difficulty A to B	-1.198	2.977	-0.900	0.900
Board Difficulty B to C	0.136	0.297	-0.890	0.900

3.3 Association among Variables

Similar to previous studies (e.g., Paulhus & Williams, 2002) the Dark Triad personality traits were significantly correlated with each other (Table 5).

Table 5: Correlations between Self-report Measures

	1.	2.	3.	4.	5.	6.
1. Psychopathy	-	**0.480***	**0.602***	**0.198***	0.135	**-0.417***
2. Narcissism	**0.480***	-	**0.314***	0.108	**0.143***	**-0.254***
3. Machiavellianism	**0.602***	**0.314***	-	**0.171**$^{+}$	0.105	**-0.177***
4. Obj. Numeracy	**0.198***	0.108	**0.171**$^{+}$	-	**0.548***	0.123
5. Subj. Numeracy	0.135	**0.143***	0.105	**0.548***	-	0.073
6. Empathy	**-0.417***	**-0.254***	**-0.177***	0.123	0.073	-

Additionally, the Dark Triad personality traits were significantly, negatively correlated with empathy. There was also a significant correlation between narcissism and subjective numeracy scores, as well as between psychopathy and objective numeracy scores. Machiavellianism was marginally correlated with objective numeracy scores. Moreover, objective and subjective numeracy were positively correlated with each other. The association among the dependent variables was also examined with the majority of the dependent variables being highly correlated with each other (Table 6).

Table 6: Correlations between Dependent Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. No. Hard A	-	**0.249***	**0.338***	**0.910***	**0.361***	**0.263***	**0.537***	-0.049	-0.049	**0.524***	**0.425***	0.106
2. No. Hard B	**0.249***	-	**0.198***	**0.214***	**0.895***	0.156	0.040	**-0.673***	**0.659***	0.051	**-0.644***	**0.625***
3. No. Hard C	**0.338***	**0.198***	-	**0.258***	**0.208***	**0.918***	**-0.613***	0.088	**-0.607***	**-0.545***	0.025	**-0.529***
4. Board Difficulty A	**0.910***	**0.214***	**0.258***	-	**0.348***	**0.233***	**0.538***	**0.514***	-0.023	**0.613***	**0.512***	0.109
5. Board Difficulty B	**0.361***	**0.895***	**0.208***	**0.348***	-	**0.206***	0.132	**-0.495***	**0.570***	0.117	**-0.627***	**0.667***
6. Board Difficulty C	**0.263***	0.156	**0.918***	**0.233***	**0.206***	-	**-0.589***	0.067	**-0.568***	**-0.625***	0.012	**-0.591***
7. No. Hard Cards A to C	**0.537***	0.040	**-0.613***	**0.538***	0.132	**-0.589***	-	**0.379***	**0.503***	**0.923***	**0.335***	**0.556***
8. No. Hard Cards A to B	**0.549***	**-0.673***	0.088	**0.514***	**-0.495***	0.067	**0.379***	-	**-0.609***	0.361	**0.897***	**-0.464***
9. No. Hard Cards B to C	-0.049	**0.659***	**-0.607***	-0.023	**0.570***	**-0.568***	**0.503***	**-0.609***	-	**0.406***	**-0.536***	**0.912***
10. Board Difficulty A to C	**0.524***	0.051	**-0.545***	**0.613***	0.117	**-0.625***	**0.923***	**0.361***	**0.406***	-	**0.406***	**0.571***
11. Board Difficulty A to B	**0.425***	**-0.644***	0.025	**0.512***	**-0.627***	0.012	**0.335***	**0.897***	**-0.536***	**0.406***	-	**-0.518***
12. Board Difficulty B to C	0.106	**0.625***	**-0.529***	0.109	**0.667***	**-0.591***	**0.556***	**-0.464***	**0.912***	**0.571***	**-0.518***	-

*$p > 0.05$

The correlation between the independent and dependent variables was assessed as well. There were marginally significant relationships between psychopathy and the number of hard cards placed on the board by participants in condition B, as well as the difficulty of the board in condition B (Table 7). Narcissism was positively correlated with multiple of the dependent variables including: (1) placing more hard cards on the investment board in condition B, (2) making the board more difficult in condition B, (3) placing more hard cards on the board in condition B than in condition A, (4) placing more hard cards on the board in condition B than in condition C, (5) making the board more difficult in condition B than in condition A, and (6) making the board more difficult in condition B than in condition C. There were no significant correlations between Machiavellianism or objective numeracy and any of the dependent variables. There was however a significant relationship between subjective numeracy and placing more difficult cards on the board in condition C than in condition A and making the board more difficult in condition C than in condition A. Also, empathy was correlated with placing fewer hard cards on the board in condition B.

Table 7: Correlations between Self-report and Dependent Variables

	1. Psych.	2. Narc.	3. Mach.	4. Obj. Num.	5. Subj. Num.	6. Emp.
1. No. Hard A	-0.003	0.000	0.012	-0.124	-0.119	-0.124
2. No. Hard B	**0.157**$^{+}$	**0.269***	0.086	-0.059	0.064	**-0.194***
3. No. Hard C	-0.003	-0.106	-0.011	0.046	0.127	-0.039
4. Board Difficulty A	0.064	0.038	0.040	-0.082	-0.090	-0.148
5. Board Difficulty B	**0.171**$^{+}$	**0.288***	0.141	0.007	0.040	-0.126
6. Board Difficulty C	0.034	-0.010	-0.032	0.092	0.149	-0.058
7. No. Hard Cards A to C	0.007	0.096	0.021	-0.155	**-0.207***	-0.074
8. No. Hard Cards A to B	-0.138	**-0.232***	-0.066	-0.046	-0.147	0.072
9. No. Hard Cards B to C	0.134	**0.303***	0.087	-0.085	-0.065	-0.137
10. Board Difficulty A to C	0.018	0.050	0.043	-0.147	**-0.202***	-0.082
11. Board Difficulty A to B	-0.118	**-0.222***	-0.114	-0.081	-0.114	-0.004
12. Board Difficulty B to C	0.120	**0.249***	0.140	-0.059	-0.100	-0.089

3.4 Differences in Decision-Making between Conditions

To test the first hypothesis that individuals would make riskier decisions for the other person when there were self- and other-reward asymmetries compared to when there were only other-rewards or only self-rewards (H1) two repeated measures ANOVAs were conducted. For the first repeated measures ANOVA, the number of hard cards placed on the investment board during each condition were analyzed as the repeated measure. The results indicated that there was a significant difference in the number of hard cards placed on the investment board by participants in the three different conditions, $F(2, 232) = 14.422$, $p < 0.001$. In support of the first hypothesis, participants placed significantly more hard cards on the board in condition B

(i.e., self- and other-reward asymmetry) than in conditions A (i.e., other-reward) or condition C (i.e., self-reward) (Figure 1). There was not a significant difference in the number of hard cards placed on the investment board by participants in condition A and condition C.

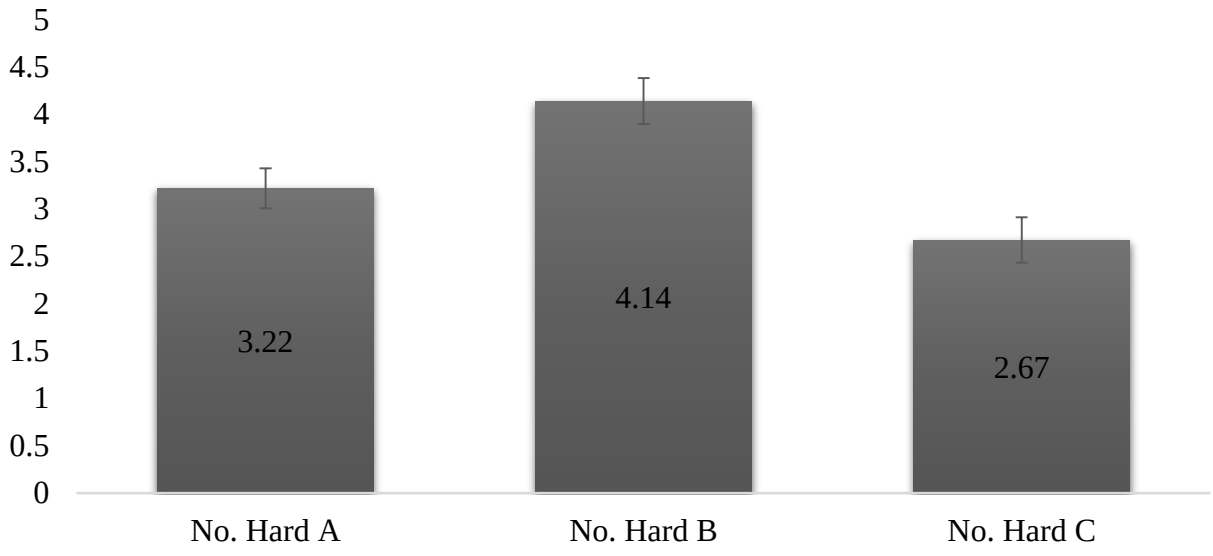


Figure 1. Average number of hard cards placed on the board in each condition with standard error bars.

The second repeated measures ANOVA was conducted to examine the differences in board difficulty (i.e., higher difficulty means a greater probability of a hard card being chosen) between conditions. This analysis indicated that there was a significant difference in the difficulty of the investment board set up by participants in each condition, $F(2, 224) = 10.295$, $p < 0.001$. Also providing support for the first hypothesis, participants set up the board to be significantly more difficult in condition B as compared to condition C; the difficulty of the board did not differ between conditions A and C or between conditions A and B (Figure 2).

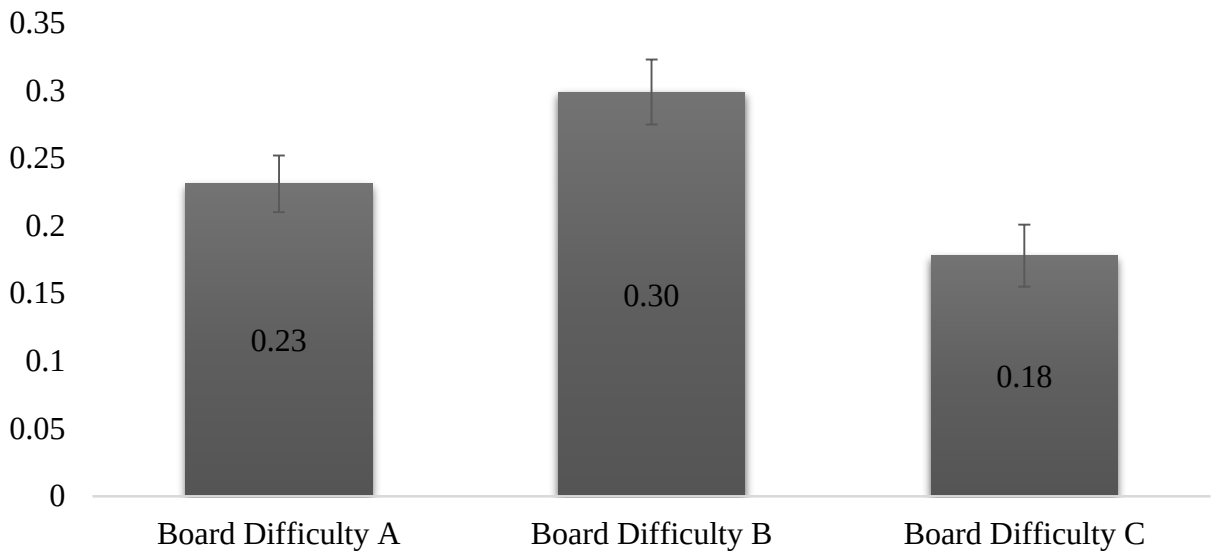


Figure 2. Average board difficulty in each condition with standard error bars.

The effects of interpersonal closeness and the order of decisions on these participants' choices were examined as between subjects variables in both repeated measures ANOVAs. It was hypothesized that individuals who bonded with the other person would make less risky decisions for the other person in the other-reward and self- and other-reward asymmetry conditions compared to those who did not bond with the other person (H2). This hypothesis was not supported. Specifically, there was not a significant interaction between activity and the order of conditions on the number of hard cards placed on the board across conditions, $F(2, 232) = 0.657$, $p = 0.519$. There was also not a significant interaction between the activity participants engaged in (i.e., bonding or neutral) and the number of hard cards placed on the board across conditions, $F(2, 232) = 0.801$, $p = 0.450$.

However, the hypothesis that the order of conditions would affect participants' decisions such that those who completed the self- and other-reward asymmetry condition first were expected to anchor their subsequent decision in the other-reward only condition to their decision in the self- and other-reward asymmetry condition (H3) was supported. Specifically, there was a

significant interaction between the order of conditions and the number of hard cards placed on the investment board by participants in each condition, $F(2, 232) = 6.974$, $p = 0.001$. Those assigned to complete condition A (i.e., self-reward) before condition B (i.e., self- and other-reward asymmetry) placed significantly fewer hard cards on the investment board in conditions A and C (i.e., self-reward) than in condition B (Figure 3). The number of hard cards placed on the board by participants in conditions A and C did not significantly differ. Also, participants assigned to complete condition A first placed significantly fewer hard cards on the board in condition A than did participants assigned to complete condition B first. However, those assigned to complete condition B first did not place a significantly different number of hard cards on the investment board in any one condition

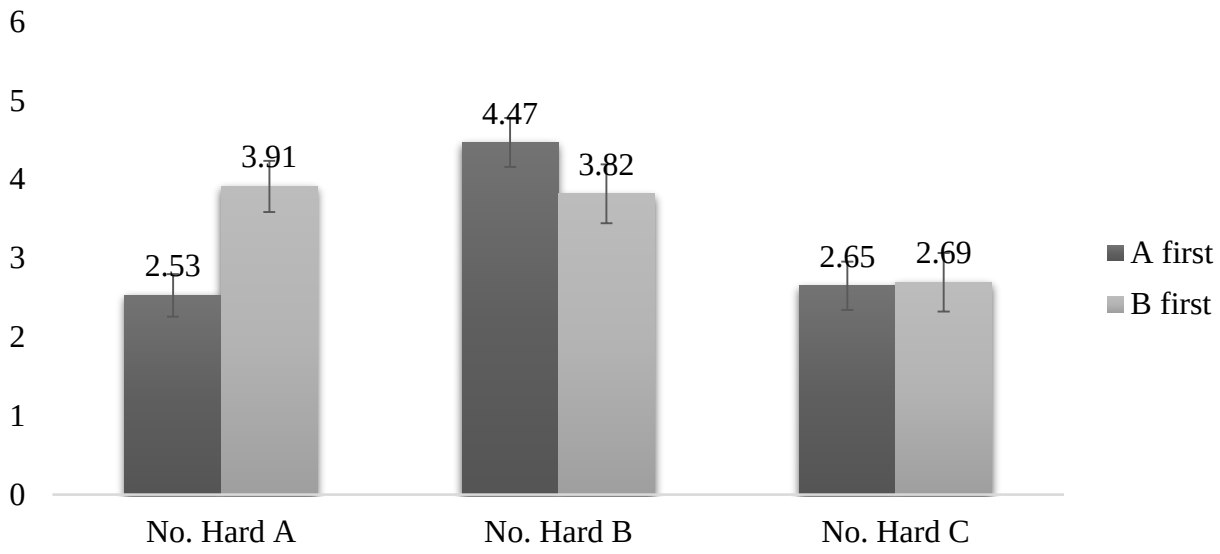


Figure 3. Average number of hard cards placed on the board in each condition separated by the order of conditions.

Additionally, there was again a significant interaction between board difficulty and the order of conditions, $F(2, 224) = 7.667$, $p = .001$. Participants assigned to complete condition A

first set up the investment board to be significantly more difficult in condition B than in conditions A or C (Figure 4). Among these participants there was not a significant difference in board difficulty for conditions A and C. Moreover, those assigned to complete condition A first set up a significantly less difficult investment board for condition A than did those assigned to complete condition B first. However, those assigned to complete condition B first did not set up significantly more or less difficult boards in any of the conditions.

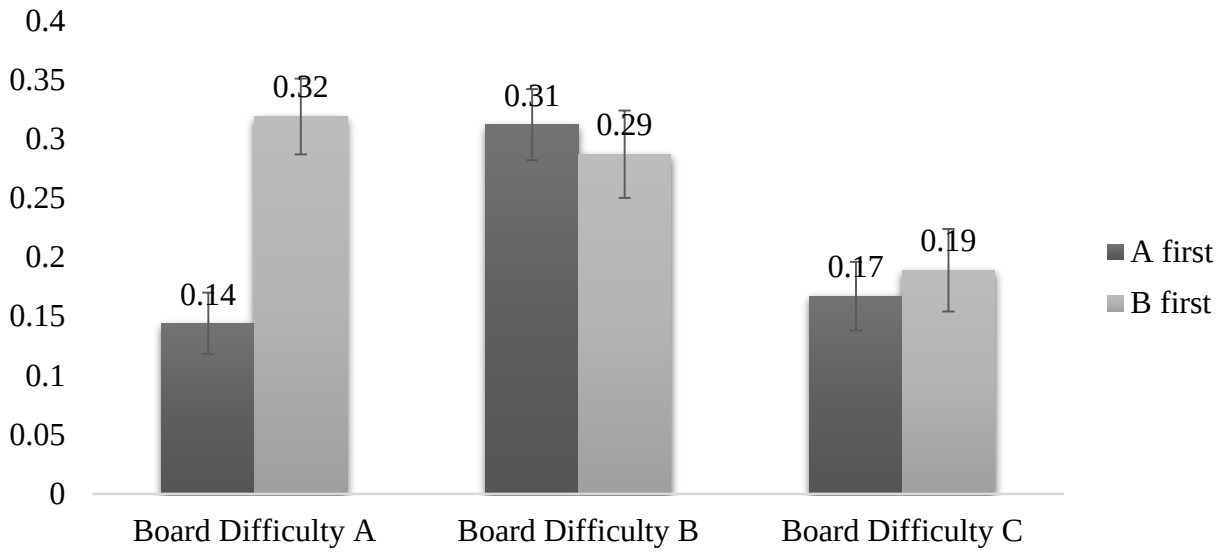


Figure 4. Average board difficulty in each condition separated by the order of conditions.

3.5 Effect of Dark Triad Variables

One of the primary goals of this project was to examine the effect of Dark Triad variables on decision making for oneself versus others. Each of these traits was hypothesized to be associated with making more self-centered choices. However, it was predicted that those higher in narcissism would make less selfish decisions when they bonded with the other person than when they engaged in a neutral activity. In order to test these hypotheses, three separate regressions were conducted to determine the effect of the Dark Triad traits on participants' decisions in each condition. The regressions were conducted separately due to concerns

regarding the interpretability of findings resulting from analyses in which the shared variance among the independent variables is removed from the analysis (Lynam, Hoyle & Newman, 2006). As the Dark Triad are all highly correlated with each other (Table 5), it has been argued that regressions in which all three traits are included result in findings that no longer reflect the constructs of interest (Lynam et al., 2006). In order to avoid this problem, the effect of each Dark Triad trait was considered separately.

The activity participants completed (i.e., bonding or neutral) was included in each regression with activity being effects coded (i.e., bonding = 1; neutral = -1). Additionally, the effect of objective numeracy and subjective numeracy were included in the regressions examining the effect of psychopathy and narcissism, respectively. This is due to the significant correlation between these variables, indicating a potential interaction between the Dark Triad traits and numeracy (Table 5). Given the potential of an interaction between these variables, all interactions between the independent variables were examined in the regressions discussed below. All interactions were included as including only select interactions results in a bias towards the included interactions being significant.

3.4.1 Narcissism

The effect of narcissism on participants' decisions across condition was examined using a series of linear regressions. The hypothesis that those higher in narcissism would make riskier decisions for others in the other-reward and self- and other-reward asymmetry conditions (H4) was partially supported. In support of this hypothesis, those higher in narcissism placed more hard cards on the board in condition B (i.e., self- and other-reward asymmetry) and made the board more difficult in condition B (Table 8). However, in contrast to our hypothesis, there was not a significant relationship between narcissism and the number of hard cards placed on the

board in condition A or board difficulty in condition A. There were, however, several non-hypothesized significant interactions between narcissism and subjective numeracy, which suggest an effect of narcissism on the riskiness of the board in conditions A and B among those higher in subjective numeracy.

Additionally, the hypothesis that those higher in narcissism who bonded with the other person would make less risky decisions for the other person in the other-reward and self- and other-reward asymmetry conditions than those higher in narcissism who did not bond with their partner (H5) was not supported. Specifically, none of the interactions between narcissism and condition were supported (Table 8; Table 9). However, there were several non-hypothesized interactions between narcissism, condition, and subjective numeracy, which suggested an effect of condition on narcissism only among those high in subjective numeracy.

The non-hypothesized significant interactions between narcissism and subjective numeracy, as well as narcissism, subjective numeracy, and condition are examined below. Specifically, analysis indicated a significant effect of narcissism such that those higher in narcissism placed more hard cards on the board in condition B compared to conditions A and C and made the board more difficult in condition B compared to condition C (Table 8; Table 9). There was also a marginally significant effect indicating those higher in narcissism placed more hard cards on the board in condition A compared to condition C and made the board more difficult in condition B than in condition A (Table 9).

Table 8: Regression of Narcissism on Risk for Each Scenario

	No. Hard A	No. Hard B	No. Hard C	Board Difficulty A	Board Difficulty B	Board Difficulty C
Narcissism	.070[-.106, .245]	**.264[.091, .438]***	-.121[-.304, .063]	.098[-.078, .274]	**.287[.113, .462]***	-.027[-.212, .158]
Subj. Numeracy	**-.178[-.356, .000]***	.004[-.172, .179]	.134[-.056, .325]	-.153[-.332, .026]	-.020[-.198, .158]	.141[-.054, .337]
Condition	**.188[.013, .362]***	-.065[-.237, .106]	-.036[-.221, .149]	.141[-.035, .317]	-.026[-.201, .149]	-.047[-.234, .141]
Narc*Condition	.008[-.167, .184]	-.036[-.209, .137]	-.107[-.291, .076]	-.026[-.202, .151]	-.068[-.242, .106]	-.135[-.319, .050]
Narc*Subj. Numeracy	.106[-.069, .280]	-.084[-.256, .089]	.009[-.174, .192]	.124[-.051, .300]	-.086[-.260, .087]	.036[-.149, .221]
Condition*Subj. Numeracy	.073[-.105, .251]	.143[-.033, .318]	.014[-.177, .204]	.094[-.085, .273]	.116[-.062, .294]	.000[-.195, .196]
Narc*Cond*Subj. Numeracy	**-.271[-.446, -.096]***	**-.158[-.331, .015]**$^{+}$	-.078[-.260, .105]	**-.280[-.455, -.104]***	**-.159[-.333, .015]**$^{+}$	-.097[-.282, .087]

*$p < .05$ $^{+}p < .090$

Table 9: Regression of Narcissism on Risk Differences between Each Scenarios

	No. Hard Cards A to C	No. Hard Cards A to B	No. Hard Cards B to C	Board Difficulty A to C	Board Difficulty A to B	Board Difficulty B to C
Narcissism	**.165[-.011, .341]**$^{+}$	**-.175[-.347, -.002]***	**.314[.138, .489]***	.109[-.072, .289]	**-.175[-.352, .001]**$^{+}$	**.266[.087, .455]***
Subj. Numeracy	**-.263[-.446, -.081]***	-.140[-.315, .036]	-.121[-.303, .060]	**-.245[-.437, -.054]***	-.111[-.291, .070]	-.138[-.328, .052]
Condition	**.179[.022, .357]***	**.203[.031, .375]***	-.023[-.200, .154]	.140[-.044, .324]	.130[-.047, .307]	.016[-.166, .198]
Narc*Condition	.098[-.078, .274]	.037[-.136, .210]	.059[-.177, .234]	.094[-.087, .274]	.048[-.128, .225]	.050[-.130, .229]
Narc*Subj. Numeracy	.083[-.093, .258]	**.152[-.020, .324]**$^{+}$	-.082[-.256, .093]	.071[-.110, .251]	**.186[.010, .362]***	-.107[-.286, .072]
Condition*Subj. Numeracy	.055[-.128, .237]	-.068[-.243, .107]	.085[-.096, .267]	.066[-.126, .258]	-.031[-.211, .150]	.085[-.105, .275]
Narc*Cond*Subj. Numeracy	**-.152[-.327, .024]**$^{+}$	-.072[-.244, .100]	-.073[-.248, .101]	-.136[-.316, .044]	-.081[-.257, .094]	-.062[-.241, .118]

*$p < .05$ +$p < .090$

Additionally, there were two significant two-way interactions between narcissism and subjective numeracy on the number of hard cards placed on the board in condition A compared to condition B and the difficulty of the board in condition A compared to condition B (Table 9). Expressly, those lower in narcissism, who were also lower in subjective numeracy tended to place more hard cards on the board in condition A compared to condition B than did those lower in narcissism who were higher in subjective numeracy (Figure 5). However, subjective numeracy did not seem to affect the difference in the number of hard cards on the board in condition A compared to condition B for those higher in narcissism (Figure 5).

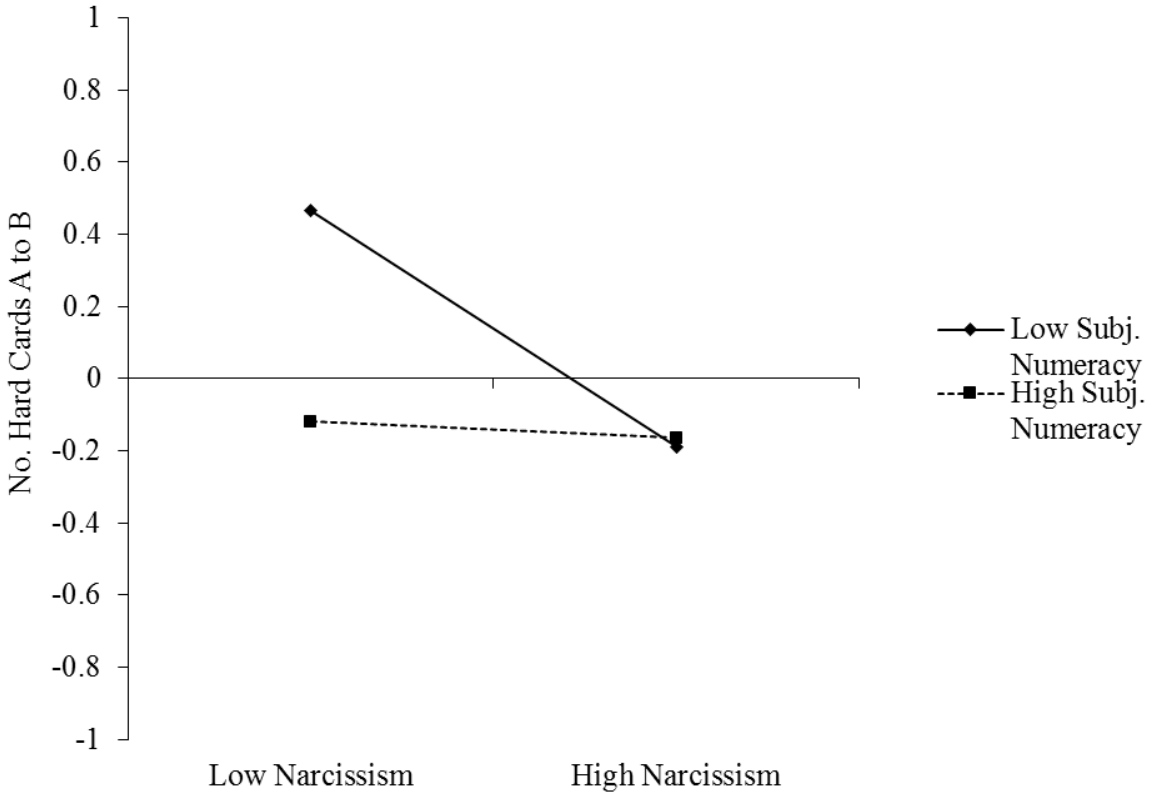


Figure 5. Interaction between subjective numeracy and narcissism on the number of hard cards placed on the board in condition A (other-reward only) compared to condition B (self- and other-reward asymmetry)

Further, narcissism levels did not appear to affect the difference in board difficulty between conditions A and B among those high in subjective numeracy (Figure 6). Yet, among those lower in narcissism, those also lower in subjective numeracy made the board more difficult in condition A compared to condition B compared to those higher in subjective numeracy (Figure 6). However, for those higher in narcissism, there did not appear to be a difference in board difficulty between conditions A and B based on subjective numeracy (Figure 6).

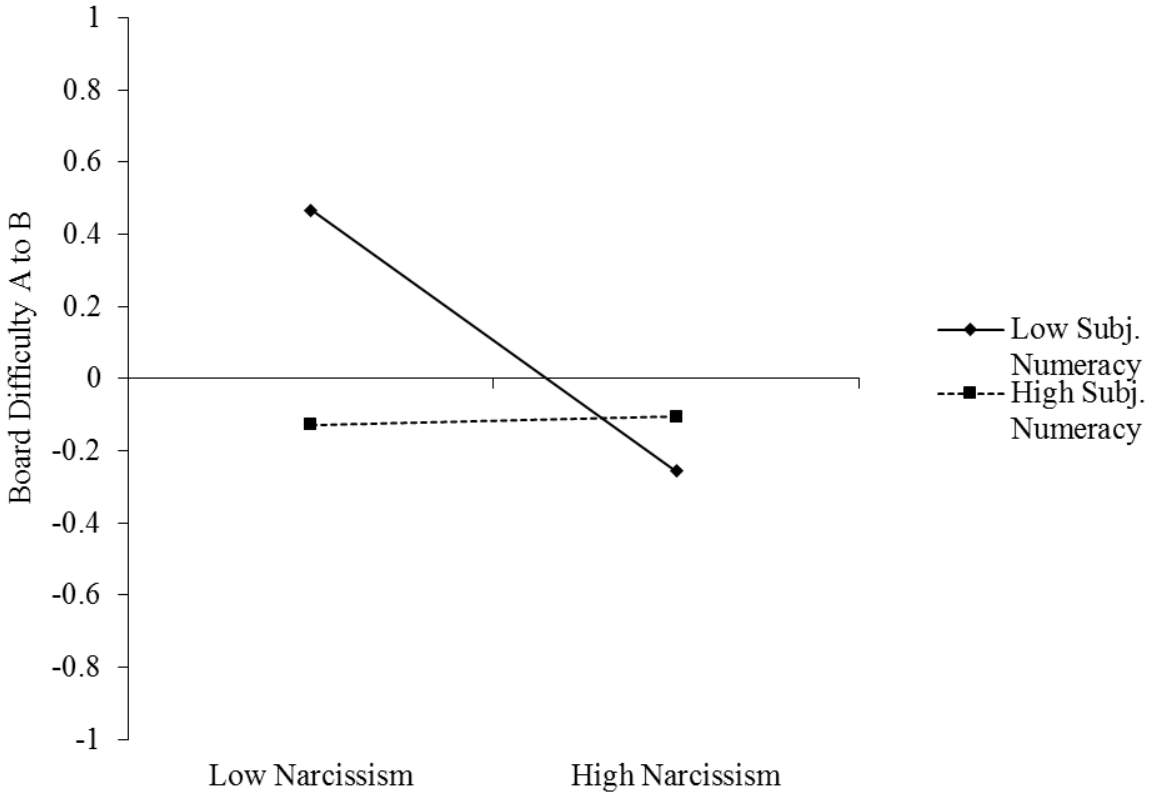


Figure 6. Interaction between subjective numeracy and narcissism on difficulty of the board in condition A (other-reward only) compared to condition B (self- and other-reward asymmetry)

There was also a significant three-way interaction between narcissism, subjective numeracy, and whether participants bonded with their partner or not, on the number of hard cards placed on the board in condition A and the difficulty of the board in condition A (Table 8). Expressly, among those lower in narcissism, those higher in subjective numeracy who bonded with their partner tended to place fewer hard cards on the board in condition A than did those lower in subjective numeracy who bonded with their partner (Figure 7). However, this trend was reversed among those higher in narcissism (Figure 7).

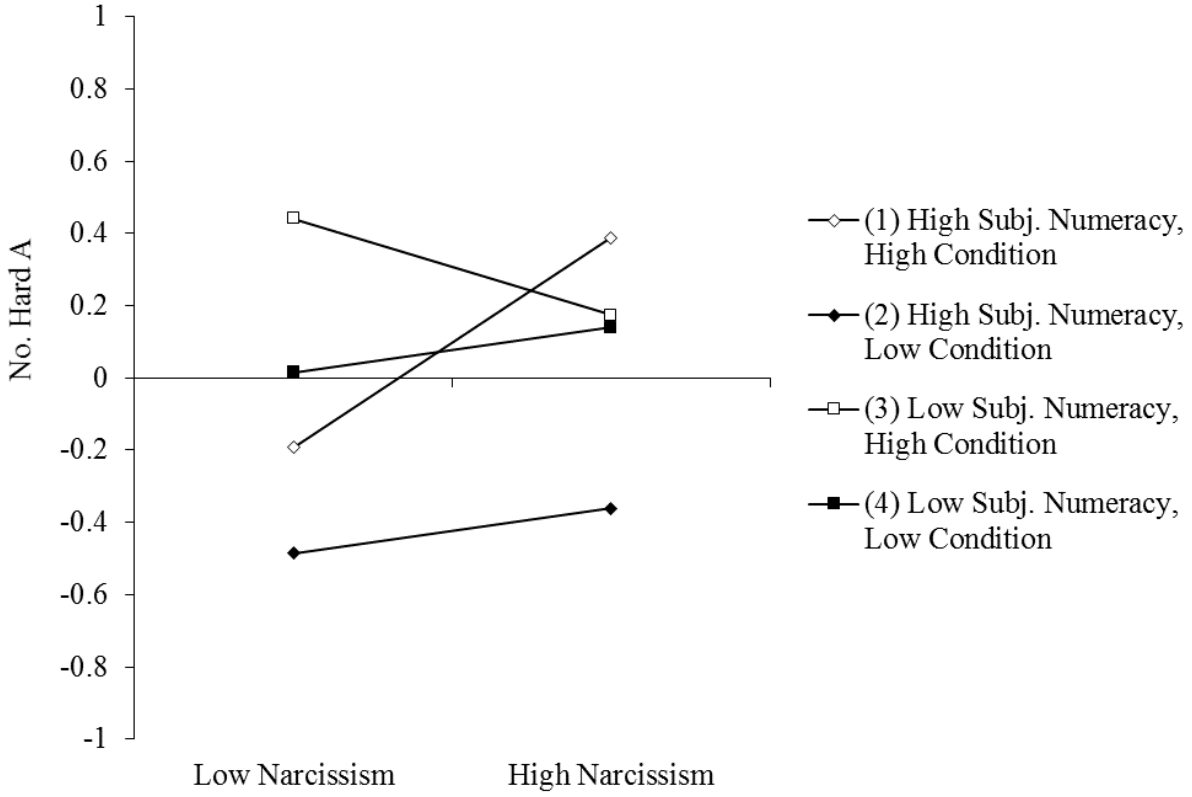


Figure 7. Interaction between bonding (high condition)/non-bonding (low condition), subjective numeracy and narcissism on the number of cards placed on the board in condition A (other-reward only)

For board difficulty in condition A, among those lower in narcissism participants who did not bond with their partner and had lower subjective numeracy made the board more difficult than those who were high in subjective numeracy and did not bond with their partner (Figure 8). However among those higher in narcissism, this trend was reversed (Figure 8). Furthermore, among those higher in narcissism who bonded with their partner, those higher in subjective numeracy made the board less difficult than did those lower in subjective numeracy (Figure 8). Yet, among those lower in narcissism who bonded with their partner, those higher in subjective numeracy made the board more difficult than those lower in subjective numeracy (Figure 8).

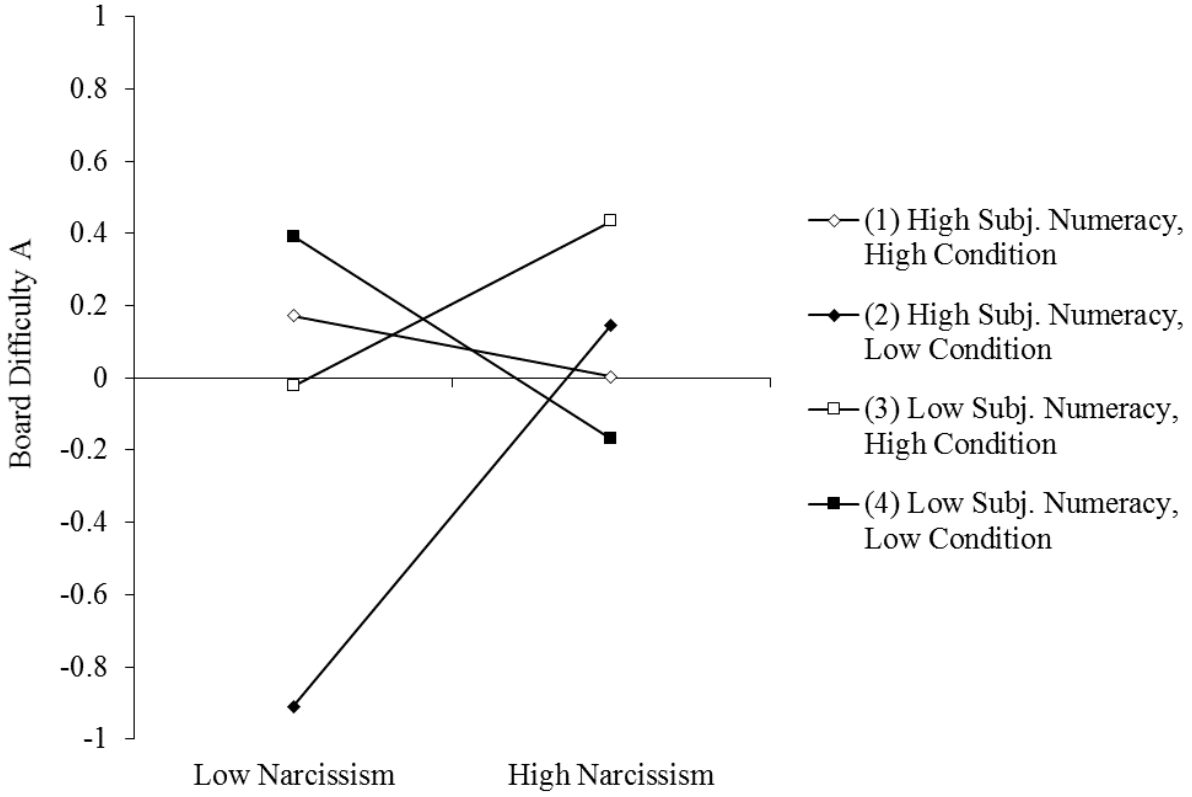


Figure 8. Interaction between bonding (high condition)/non-bonding (low condition), subjective numeracy and narcissism on difficulty of the board in condition A (other-reward only)

Three other three-way interactions between narcissism, subjective numeracy, and activity completed by participants (i.e., bonding or neutral) were marginally significant. Those higher in subjective numeracy and narcissism who bonded with their partner tended to place fewer hard cards on the board in condition B than did those lower in subjective numeracy or those higher in subjective numeracy who did not bond with their partner (Table 8; Figure 9). This same trend was seen for the difficulty of the board in condition B (Table 8; Figure 10).

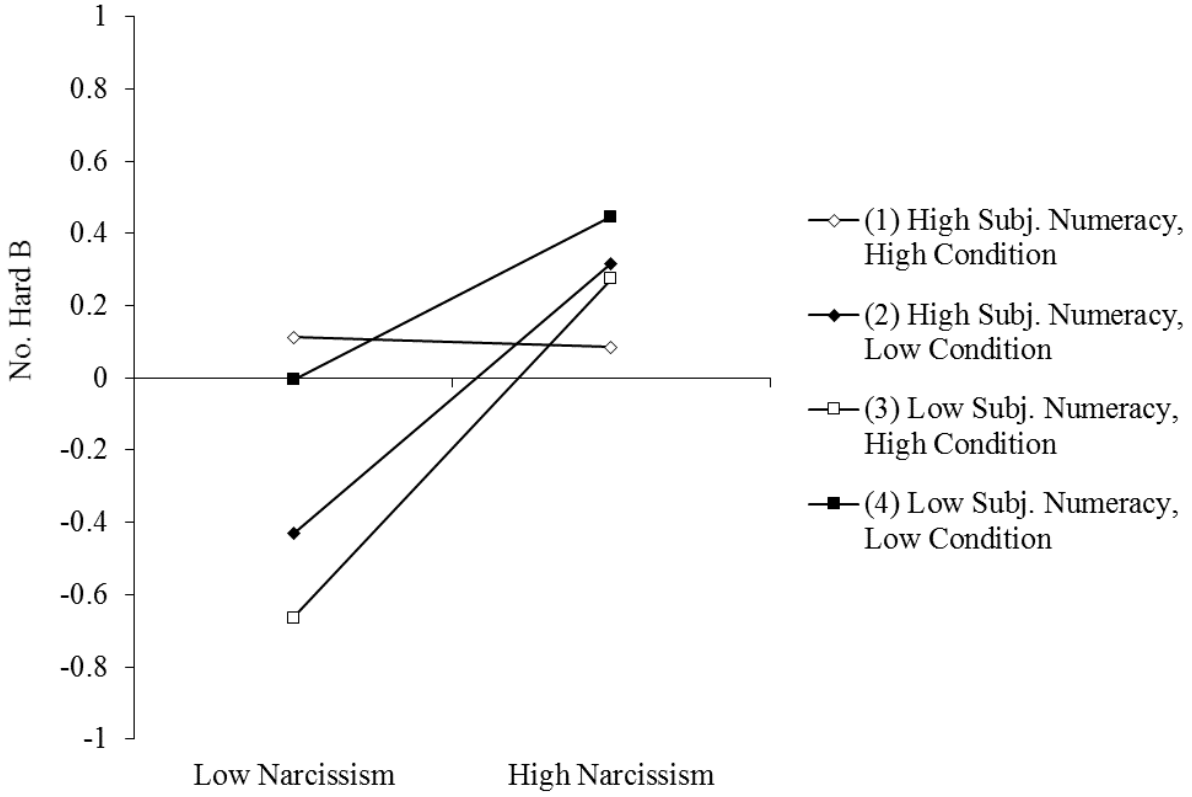


Figure 9. Interaction between bonding (high condition)/non-bonding (low condition), subjective numeracy and narcissism on the number of hard cards placed on the board in condition B (self- and other-reward asymmetry)

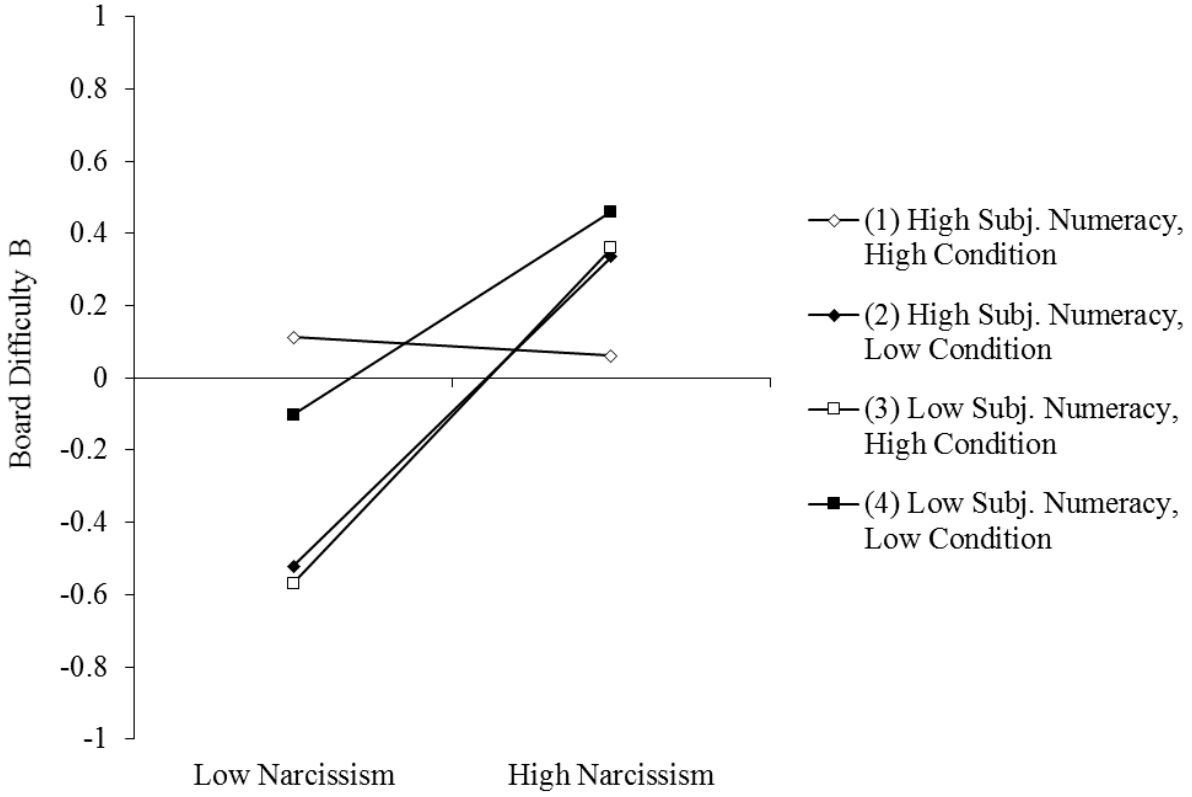


Figure 10. Interaction between bonding (high condition)/non-bonding (low condition), subjective numeracy and narcissism on difficulty of the board in condition B (self- and other-reward asymmetry)

A significant three-way interaction between narcissism, subjective numeracy and condition was also observed for the difference in the number of hard cards placed on the board in condition A compared to condition C (Table 9). Specifically, among those higher in narcissism, those with lower subjective numeracy, who did not bond with their partner, placed fewer hard cards on the board in condition A than in condition C compared to those higher in subjective numeracy who did bond with their partner (Figure 11). Yet, this trend was reversed among those lower in narcissism (Figure 11). Additionally, among those higher in narcissism, those lower in subjective numeracy, who bonded with their partner tended to place more hard cards on the board in condition A compared to condition C than did those lower in subjective numeracy who

did not bond with their partner (Figure 11). However, among those lower in narcissism, those lower in subjective numeracy who did not bond with their partner placed more hard cards on the board in condition A compared to condition C than did those higher in subjective numeracy who bonded with their partner (Figure 11).

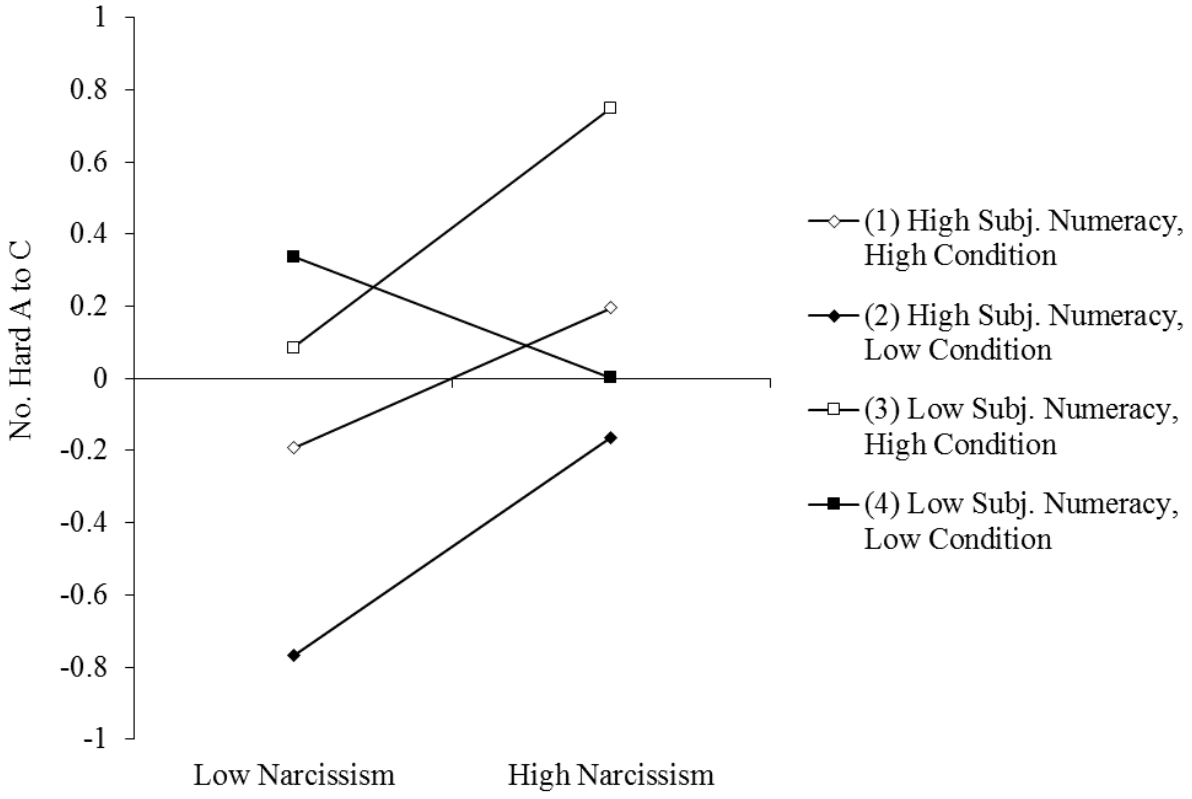


Figure 11. Interaction between bonding (high condition)/non-bonding (low condition), subjective numeracy and narcissism on the number of hard cards placed on the board in condition A (other-reward only) compared to condition C (self-reward only)

Subjective numeracy also significantly affected several of the outcome variables; those higher in subjective numeracy placed fewer hard cards on the board in condition A (Table 8) and placed fewer hard cards on the board in condition A compared to condition C (Table 9). Those higher in subjective numeracy also made the board significantly more difficult in condition A compared to condition C (Table 9). The activity participants completed was also significantly

related to the outcome variables such that those in the bonding condition placed more hard cards on the board in condition A (Table 8) and placed more hard cards on the board in condition A compared to conditions C and B (Table 9). However, those in the bonding condition placed more hard cards on the board in condition B than in condition A (Table 9). There was not a significant interaction between the activity completed by participants and subjective numeracy on any of the outcome variables (Table 8; Table 9). The interaction between narcissism and activity completed by participants was also not significant (Table 8; Table 9).

3.4.2 Psychopathy

The effect of psychopathy was considered in a series of linear regressions in which psychopathy, objective numeracy, the activity participants completed (i.e., bonding or neutral) and the interactions between these variables were entered as independent variables. The hypothesis that those higher in psychopathy would make riskier decisions for others in the other-reward and self- and other-reward asymmetry conditions regardless of whether they bonded with the other person (H6) was partially supported. Specifically, these analyses indicated there was a marginally significant effect of psychopathy such that those higher in psychopathy tended to place more hard cards on the board in condition B (i.e., self- versus other-reward) and to make the board more difficult in condition B (Table 10). Further, in-line with the hypothesis, there was not a significant interaction between psychopathy and condition for any of the dependent variables. However, in contrast to the hypothesis, there was not a significant effect of psychopathy on the number of hard cards placed on the board in condition A or the board difficulty in condition A (Table 10).

Table 10: Regression of Psychopathy on Risk for Each Scenario

	No. Hard A	No. Hard B	No. Hard C	Board Difficulty A	Board Difficulty B	Board Difficulty C
Psychopathy	.016[-.160, .193]	**.163[-.013, .340]**$^{+}$	.003[-.185, .190]	.085[-.095, .264]	**.164[-.016, .345]**$^{+}$	.032[-.156, .220]
Obj. Numeracy	-.118[-.306, .070]	-.040[-.227, .147]	-.004[-.207, .198]	-.083[-.274, .109]	.030[-.163, .224]	.030[-.172, .233]
Condition	**.191[.015, .368]***	-.104[-.280, .072]	-.046[-.234, .143]	.122[-.059, .302]	-.074[-.254, .105]	-.069[-.258, .121]
Psych*Condition	.016[-.160, .193]	-.126[-.302, .051]	.017[-.170, .204]	-.011[-.190, .168]	-.139[-.320, .042]	.001[-.188, .189]
Psych* Obj. Numeracy	-.139[-.329, .051]	.130[-.060, .320]	-.129[-.330, .072]	-.156[-.350, .037]	.084[-.110, .278]	-.165[-.366, .036]
Condition*Obj. Numeracy	.043[-.145, .231]	.087[-.100, .274]	-.067[-.269, .135]	.107[-.350, .037]	.129[-.064, .323]	-.053[-.256, .149]
Psych*Cond*Obj. Numeracy	**-.238[-.429, -.048]***	-.106[-.296, .084]	.031[-.170, .232]	-.150[-.343, .044]	-.083[-.276, .111]	.014[-.187, .215]

*$p < .05$ +$p < .090$

Nevertheless, there were two non-hypothesized significant interactions between psychopathy, condition and objective numeracy on the number of hard cards in condition A and the difference in the number of hard cards in condition A and C, which tend to suggest an effect of bonding on decisions made by those high in psychopathy when participants objective numeracy is considered (Table 10; Table 11). There were also several non-hypothesized significant interactions between psychopathy and objective numeracy. These non-hypothesized results are considered in more depth below.

Table 11: Regression of Psychopathy on Risk Differences between Each Scenarios

	No. Hard Cards A to C	No. Hard Cards A to B	No. Hard Cards B to C	Board Difficulty A to C	Board Difficulty A to B	Board Difficulty B to C
Psychopathy	.017[-.163, .196]	-.128[-.301, .046]	.136[-.042, .315]	.036[-.149, .222]	-.096[-.277, .084]	.117[-.065, .299]
Obj. Numeracy	-.100[-.294, .094]	-.060[-.245, .125]	-.032[-.225, .160]	-.093[-.292, .106]	-.097[-.289, .096]	.009[-.186, .205]
Condition	**.189[.008, .370]***	**.239[.066, .413]***	-.051[-.230, .128]	.138[-.050, .325]	**.158[-.022, .337]**$^{+}$	-.008[-.191, .175]
Psych*Condition	-.004[-.184, .175]	.121[-.053, .295]	-.117[-.295, .061]	-.034[-.219, .151]	.103[-.078, .283]	-.130[-.312, .052]
Psych* Obj. Numeracy	-.002[-.195, .190]	**-.219[-.406, -.032]***	**.202[.011, .393]***	-.007[-.204, .190]	**-.216[-.409, -.023]***	**.186[-.008, .380]**$^{+}$
Condition*Obj. Numeracy	.095[-.099, .289]	-.047[-.232, .138]	.125[-.067, .317]	.137[-.062, .336]	-.031[-.223, .162]	.169[-.027, .364]
Psych*Cond*Obj. Numeracy	**-.221[-.414, -.028]***	-.092[-.279, .096]	-.100[-.291, .091]	-.128[-.325, .069]	-.057[-.250, .135]	-.066[-.260, .380]

*$p < .05$ +$p < .090$

There was a significant interaction between psychopathy and objective numeracy on the difference in the number of hard cards placed on the board in condition A compared to condition B (Table 11). Psychopathy levels did not tend to affect the difference in the number of hard cards placed on the board in condition A compared to condition B among those higher in objective numeracy (Figure 12). However, those lower in objective numeracy who were also lower in psychopathy tended to place more hard cards on the board in condition A compared to condition B than those lower in psychopathy who were higher in objective numeracy (Figure 12).

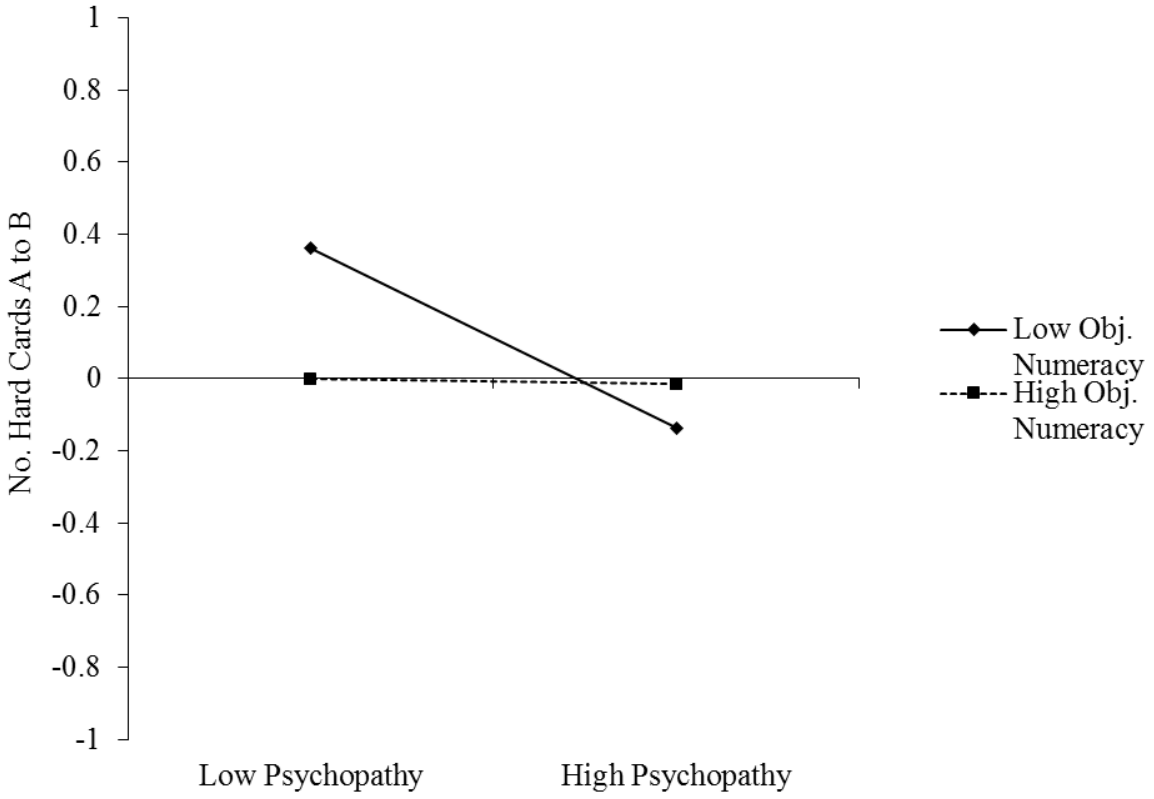


Figure 12. Interaction between objective numeracy and psychopathy on the number of hard cards placed on the board in condition A (other-reward only) compared to condition B (self- and other-reward asymmetry)

Additionally, the interaction between psychopathy and objective numeracy on the difference in difficulty of the board in condition A compared to condition B was also significant (Table 11). Among those lower in psychopathy, those higher in subjective numeracy placed more hard cards on the board in condition A compared to condition B than did those lower in objective numeracy (Figure 13). However, this trend was reversed for those high in psychopathy such that those lower in objective numeracy placed more hard cards on the board in condition A compared to condition B than did those higher in objective numeracy (Figure 13).

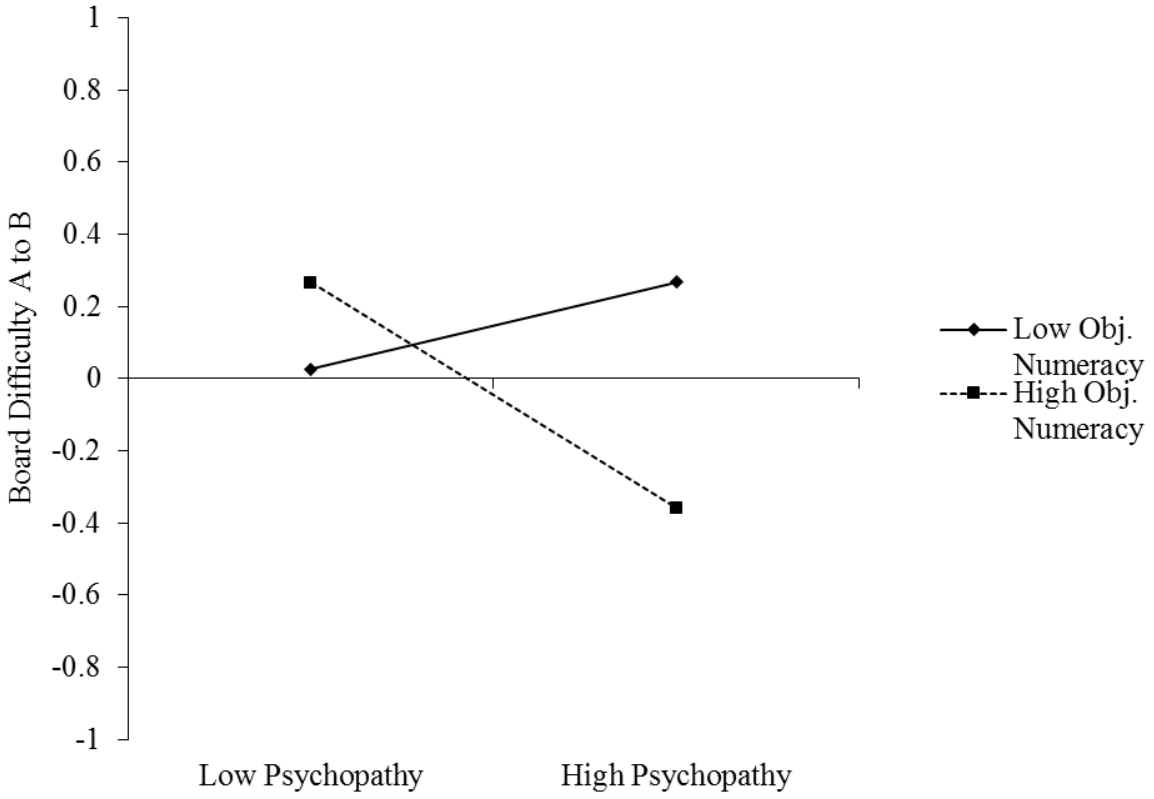


Figure 13. Interaction between objective numeracy and psychopathy on the difficulty of the board in condition A (other-reward only) compared to condition B (self- and other-reward asymmetry)

The interaction between psychopathy and objective numeracy on the difference in the number of hard cards placed on the board in condition B compared to condition C was also significant (Table 11). Specifically, among those lower in psychopathy, those with higher objective numeracy tended to put fewer hard cards on the board in condition B than in condition C compared to those lower in psychopathy and subjective numeracy (Figure 14). In contrast, those lower in objective numeracy tended to place more hard cards on the board in condition B than in condition C compared to those lower in objective numeracy, among those higher in psychopathy (Figure 14).

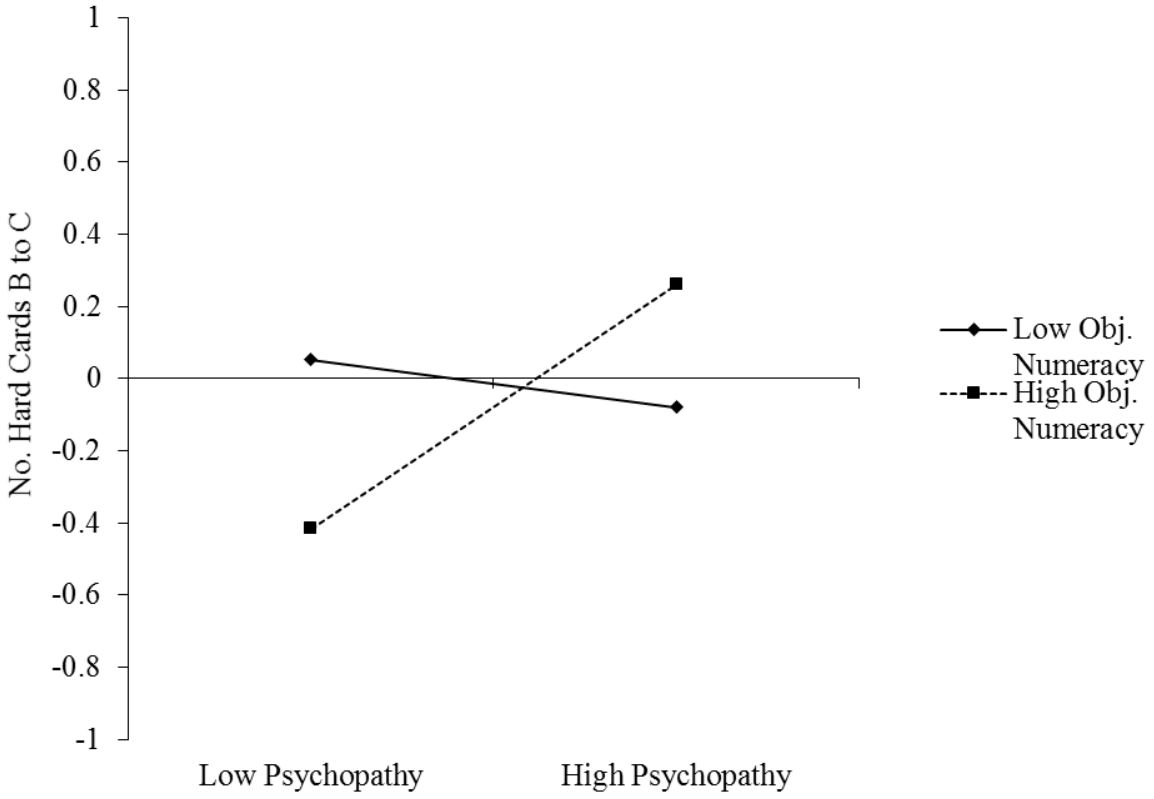


Figure 14. Interaction between objective numeracy and psychopathy on the number of hard cards placed on the board in condition B (self- and other-reward asymmetry) compared to condition C (self-reward only)

The psychopathy and objective numeracy interaction also had a marginally significant effect on the difference in board difficulty between conditions B and C (Table 11). Those high in objective numeracy and lower in psychopathy made the board more difficult in condition B compared to condition C than did those lower in psychopathy and objective numeracy (Figure 15). However, among those higher in psychopathy, those with lower objective numeracy made the board more difficult in condition B compared to condition C than did those higher in objective numeracy (Figure 15).

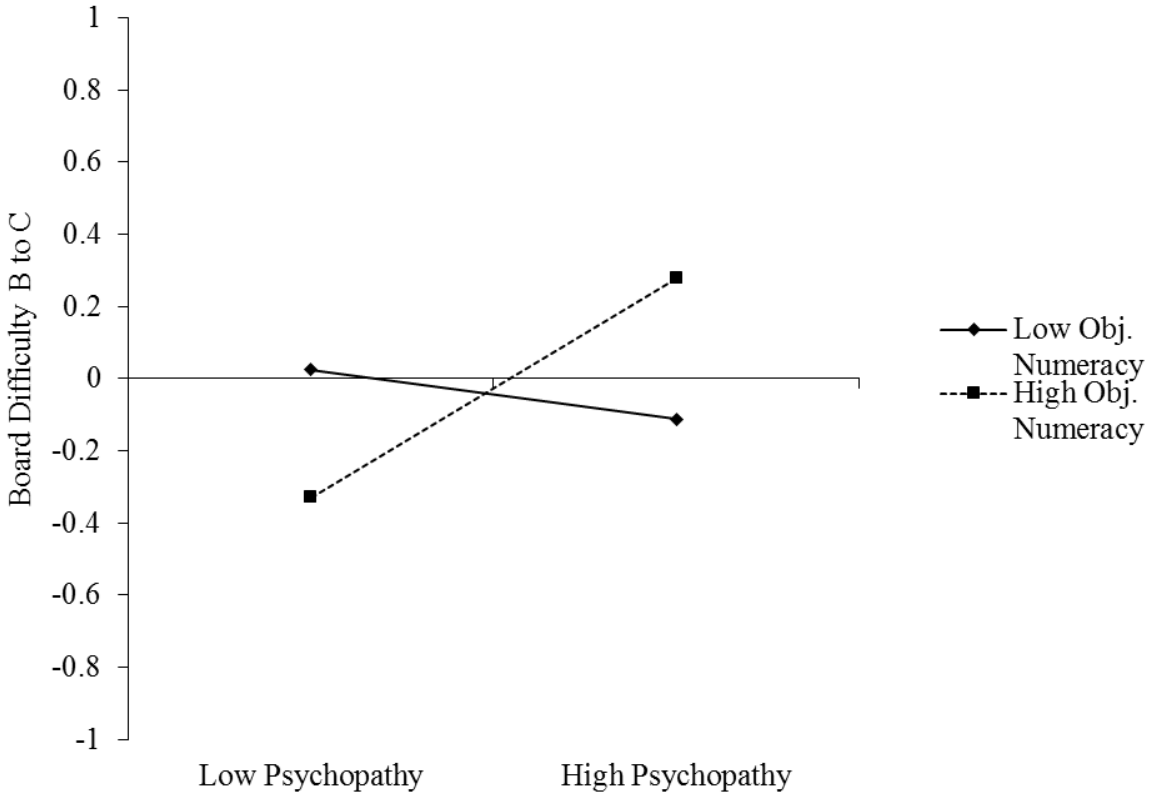


Figure 15. Interaction between objective numeracy and psychopathy on the difficulty of the board in condition B (self- and other-reward asymmetry) compared to condition C (self-reward only)

There were also two significant three-way interactions between psychopathy, objective numeracy and condition. There was a significant effect of this interaction on the number of hard cards placed on the board in condition A (Table 10). Specifically, those higher in psychopathy and lower in objective numeracy, who bonded with their partner, placed significantly more hard cards on the board in condition A compared to those higher in psychopathy who did not-bond with their partner or had higher objective numeracy (Figure 16).

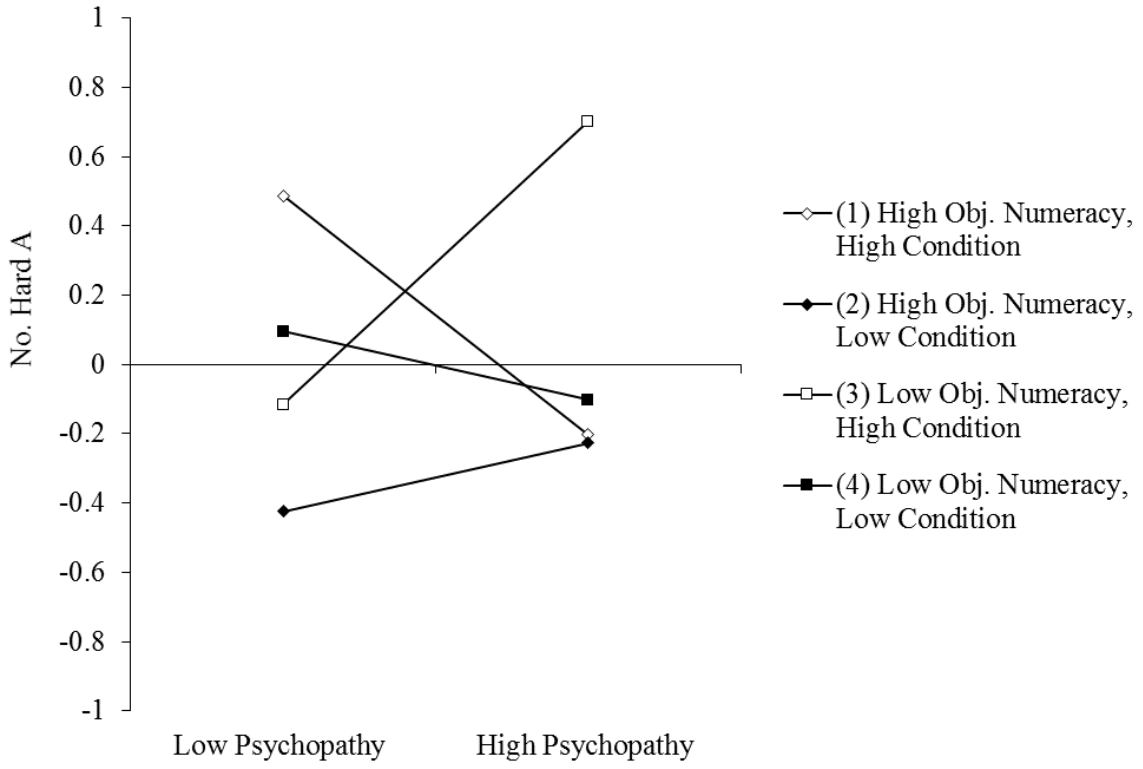


Figure 16. Interaction between (high condition)/non-bonding (low condition), objective numeracy and psychopathy on the number of hard cards placed on the board in condition A (other-reward only)

Similarly, there was also a significant three-way interaction on the number of hard cards placed on the board in condition A compared to condition C (Table 11). Those who were higher in psychopathy and lower in objective numeracy, who also bonded with their partner, tended to place more hard cards on the board in condition A than in condition C when compared to those high in psychopathy who were either did not bond with their partner or were higher in objective numeracy (Figure 17). Additionally, those lower in psychopathy who did not bond with their partner and were high in objective numeracy tended to place more hard cards on the board in condition A compared to condition C than did those lower in psychopathy who did not bond with their partner and were low in objective numeracy (Figure 17). However, among those high in

psychopathy who did not bond with their partner, objective numeracy did not tend to affect the difference in the number of hard cards placed on the board in condition A compared to condition C (Figure 17).

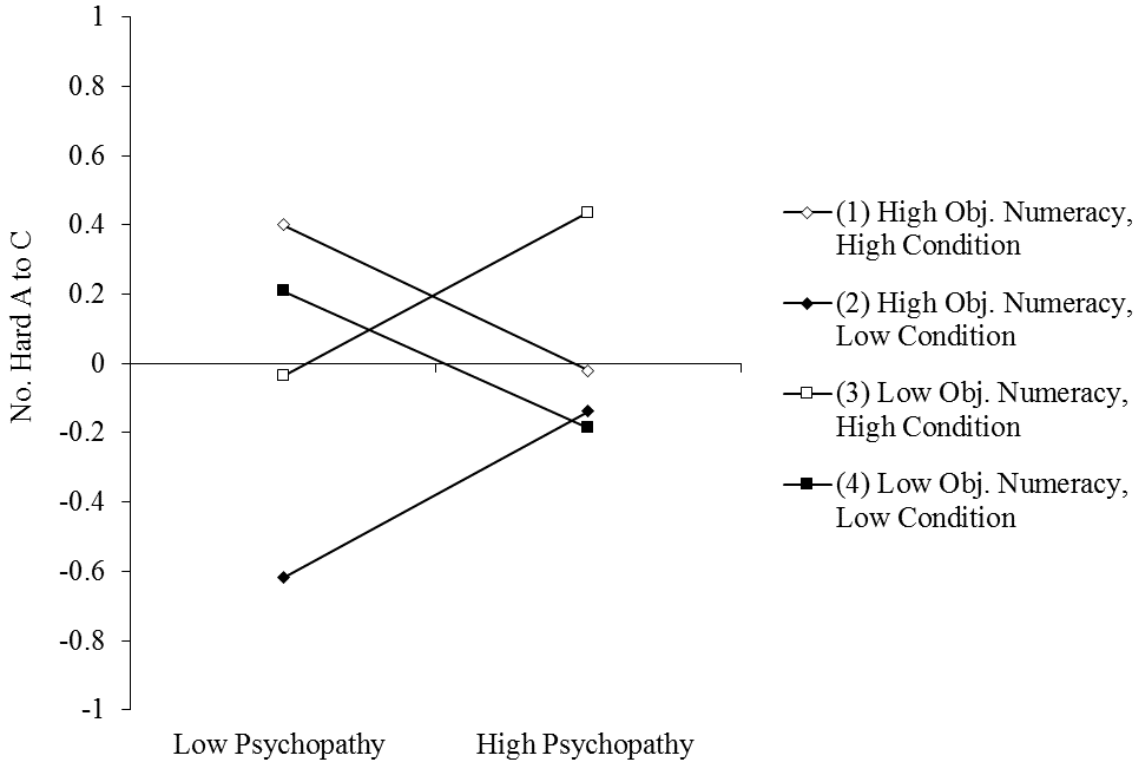


Figure 17. Interaction between (high condition)/non-bonding (low condition), objective numeracy and psychopathy on the number of hard cards placed on the board in condition A (other-reward only) compared to condition C (self-reward only)

These regressions also indicated a significant effect of condition such that those assigned to the bonding condition placed significantly more hard cards on the board in condition A (Table 10). In fact, those assigned to the bonding condition placed significantly more hard cards on the board in condition A than in conditions B or C (Table 11). There was also a marginally significant effect such that those assigned to the bonding condition made the board significantly more difficult in condition A than in condition B (Table 11). The effects of objective numeracy, the interaction

between psychopathy and activity, and the interaction between activity and objective numeracy were not significantly related to any of the outcome variables (Table 10; Table 11).

3.4.3 Machiavellianism

The hypothesis that those higher in Machiavellianism would make riskier decisions for others in the other-reward and self- and other-reward asymmetry conditions regardless of whether they bonded with the other person (H7) was partially supported. In contrast to our hypothesis, the results indicated there was not a significant effect of Machiavellianism on participants' decisions across conditions (Table 12; Table 13). However, supporting our hypothesis, there was not a significant interaction between Machiavellianism and bonding on any of the decisions (Table 12; Table 13).

There was, however, a marginally significant effect of condition such that those who bonded with their partner placed more hard cards on the board in condition A (Table 12). Additionally, those assigned to the bonding condition placed significantly more hard cards on the board in condition A than in condition B (Table 13).

Table 12: Regression of Machiavellianism on Risk for Each Scenario

	No. Hard A	No. Hard B	No. Hard C	Board Difficulty A	Board Difficulty B	Board Difficulty C
Machiavellianism	.023[-.154, .201]	.096[-.080, .272]	-.018[-.199, .162]	.043[-.136, .222]	.145[-.036, .325]	-.037[-.225, .152]
Condition	**.153[-.023, .330]**$^{+}$	-.123[-.298, .051]	-.034[-.216, .148]	.103[-.076, .282]	-.087[-.265, .090]	-.059[-.243, .126]
Mach*Condition	-.053[-.231, .125]	-.140[-.316, .036]	.058[-.122, .239]	.002[-.177, .181]	-.111[-.291, .070]	.064[-.124, .252]

*$p < .05$ +$p < .090$

Table 13: Regression of Machiavellianism on Risk Differences Between Each Scenarios

	No. Hard Cards A to C	No. Hard Cards A to B	No. Hard Cards B to C	Board Difficulty A to C	Board Difficulty A to B	Board Difficulty B to C
Machiavellianism	.036[-.142, .214]	-.066[-.240, .108]	.099[-.078, .277]	.051[-.136, .239]	-.111[-.292, .069]	.144[-.041, .329]
Condition	.146[-.033, .326]	**.226[.052, .399]***	-.072[-.251, .107]	.116[-.068, .301]	.152[-.026, .330]	-.022[-.204, .159]
Mach*Condition	-.098[-.276, .080]	.078[-.096, .253]	-.150[-.328, .027]	-.067[-.254, .120]	.089[-.091, .270]	-.147[-.332, .038]

*$p < .05$ +$p < .090$

3.6 Effect of Dark Triad Variables by Order of Conditions

As the order participants were assigned to complete the three conditions significantly affected the number of hard cards on the investment board and difficulty of the investment board I wanted to probe any potential effect of order on the relationship between the Dark Triad variables and decision making across conditions. As such, I examined the effect of the Dark Triad variables on the dependent variables separately for those assigned to complete condition A first (n = 73) and for those assigned to complete condition B first (n = 49). However, I only conducted regressions for outcome variables involving condition A, as this was the only condition for which a significant difference was exhibited based on the order of conditions. Additionally, it should be noted that these analyses are underpowered and post-hoc examinations of the data; any interpretations based on these results should be tempered accordingly.

3.6.1 Condition A First

Again three separate linear regressions were conducted to examine the effect of the Dark Triad traits. In the regression examining the effect of narcissism, there was a significant effect of narcissism such that those higher in narcissism placed more hard cards on the board in condition

B compared to condition A (Table 14). Those higher in narcissism also made the board significantly more difficult in condition B compared to condition A (Table 14). There was also a significant three-way interaction between narcissism, subjective numeracy and whether participants bonded with their partner on the difficulty of the board in condition A (Table 14).

Table 14: Regression of Narcissism on Risk for those who completed Condition A First

	No. Hard A	Board Difficulty A	No. Hard Cards A to C	No. Hard Cards A to B	Board Difficulty A to C	Board Difficulty A to B
Narcissism	.126[-.147, .399]	.232[-.034, .498]	.175[-.092, .442]	**-.318[-.564, -.073]***	.177[-.111, .465]	**-.328[-.580, -.076]***
Subj. Numeracy	-.167[-.479, .145]	-.175[-.479, .129]	**-.320[-.626, -.015]***	-.112[-.392, .168]	-.246, -.605, .113]	.034[-.254, .323]
Condition	.185[-.080, .450]	.148[-.110, .406]	.167[-.096, .429]	**.210[-.028, .448]**+	.151[-.141, .442]	.102[-.145, .350]
Narc*Condition	.037[-.236, .310]	-.001[-.266. .265]	-.003[-.270, .265]	.118[-.127, .363]	.051[-.237, .339]	.095[-.157, .347]
Narc*Subj. Numeracy	.133[-.161, .428]	.125[-.162, .413]	.131[-.157, .419]	.058[-.206, .323]	.088[-.239, .414]	.110[-.161, .382]
Condition*Subj. Numeracy	.100[-.212, .412]	.038[-.266, .342]	.042[-.264, .348]	-.129[-.409, .151]	.023[-.337, .382]	-.068[-.357, .220]
Narc*Cond*Subj. Numeracy	-.175[-.470, .120]	**-.305[-.592, -.018]***	-.168[-.456, .120]	-.157[-.422, .108]	-.189[-.516, .137]	-.130[-.402, .142]

*$p < .05$ +$p < .090$

Specifically, among those higher in narcissism, those higher in subjective numeracy made the board more difficult in condition A than did those lower in subjective numeracy (Figure 18). However, among those lower in narcissism, those with lower subjective numeracy who did not bond with their partner made the board more difficult than did those who bonded with their partner or who did not bond with their partner but had higher subjective numeracy (Figure 18). On the other hand, those higher in subjective numeracy who did not bond with their

partner made the board more difficult in condition A than did participants who bonded with their partner (Figure 18).

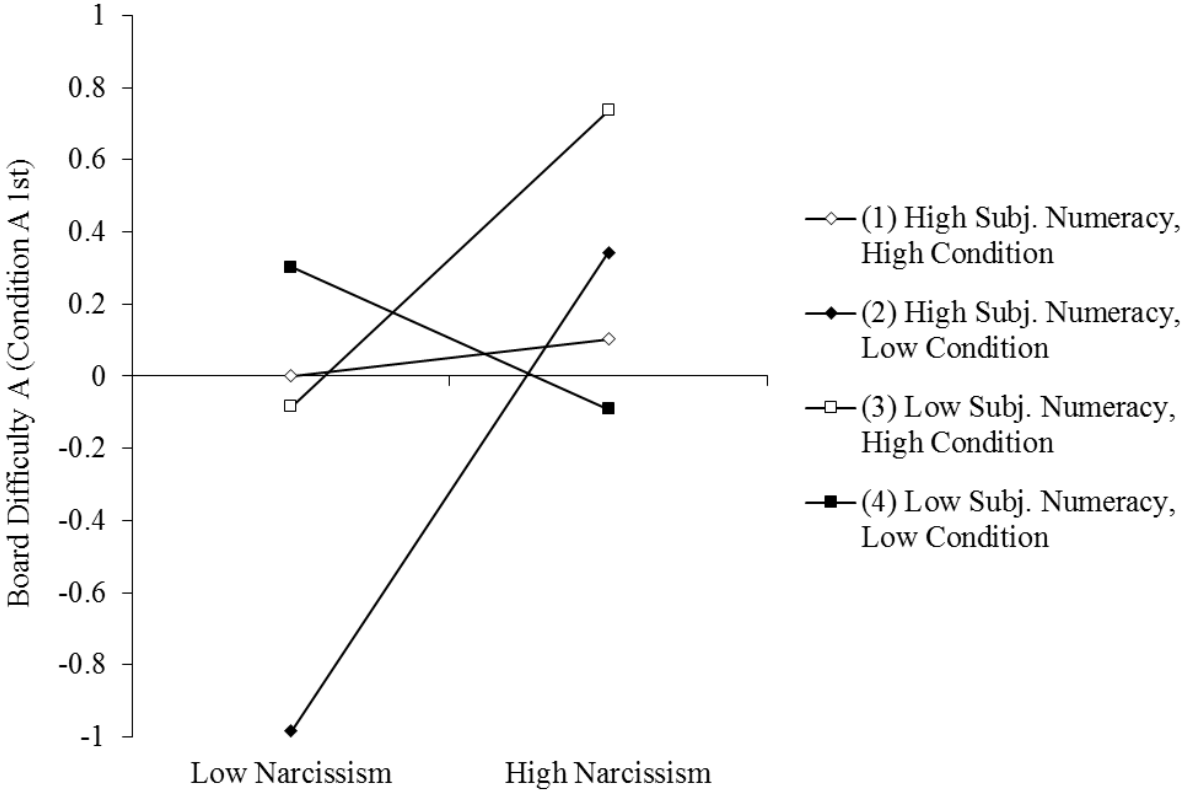


Figure 18. Interaction between bonding (high condition)/non-bonding (low condition), subjective numeracy and narcissism on difficulty of the board in condition A (other-reward only) for participants who completed condition A first

The regression examining the effect of narcissism also revealed a marginal effect of subjective numeracy such that those higher in subjective numeracy placed more hard cards on the board in condition C compared to condition A (Table 14). There was also a marginal effect of condition such that those who bonded with their partner placed more hard cards on the board in condition A than in condition B (Table 14). There were no other significant effects in the regressions focusing on the effect of narcissism.

For the regression examining the effect of psychopathy, a marginally significant effect of objective numeracy was found such that those higher in objective numeracy placed fewer hard cards on the board in condition A (Table 15). There was also a marginally significant effect of condition such that those who bonded with their partner placed fewer hard cards on the board in condition A than in condition B (Table 15). The interaction between psychopathy and whether participants bonded with their partner had a marginally significant effect on the difference in the number of hard cards participants placed on the board in condition A compared to condition C (Table 15).

Table 15: Regression of Psychopathy on Risk for those who completed Condition A First

	No. Hard A	Board Difficulty A	No. Hard Cards A to C	No. Hard Cards A to B	Board Difficulty A to C	Board Difficulty A to B
Psychopathy	.054[-.249, .357]	.079[-.232, .389]	.006[-.286, .299]	-.044[-.342, .253]	.030[-.284, .343]	-.085[-.391, .220]
Obj. Numeracy	**-.286[-.595, .023]**$^{+}$	-.180[-.497, .137]	-.193[-.498, .113]	-.053[-.358, .251]	-.114[-.446, .217]	.024[-.296, .343]
Condition	.199[-.061, .458]	.107[-.160, .373]	.101[-.150, .352]	**.237[-.019, .492]**$^{+}$	.079[-.192, .350]	.114[-.148, .377]
Psych*Condition	-.023[-.325, .280]	-.073[-.383, .237]	**-.259[-.551, .034]**$^{+}$	.228[-.070, .526]	-.186[-.499, .128]	.175[-.130, .481]
Psych*Obj. Numeracy	-.186[-.521, .149]	-.153[-.497, .190]	.125[-.198, .448]	-.085[-.414, .244]	.136[-.211, .483]	.001[-.335, .336]
Condition*Obj. Numeracy	-.065[-.374, .244]	.000[-.317, .317]	.178[-.127, .484]	-.051[-.356, .253]	.119[-.212, .451]	-.008[-.328, .311]
Psych*Cond*Obj. Numeracy	-.270[-.605, .064]	-.190[-.533, .153]	-.033[-.356, .290]	.049[-.280, .378]	-.064[-.411, .283]	.163[-.172, .499]

*$p < .05$ +$p < .090$

Expressly, for those lower in psychopathy, those who bonded with their partner placed more hard cards on the board in condition A compared to condition C than did those who did not

bond with their partner (Figure 19). However, among those higher in psychopathy, those who did not bond with their partner placed more hard cards on the board in condition C compared to condition A than did those who bonded with their partner (Figure 19). None of the other variables entered into these regressions were significant.

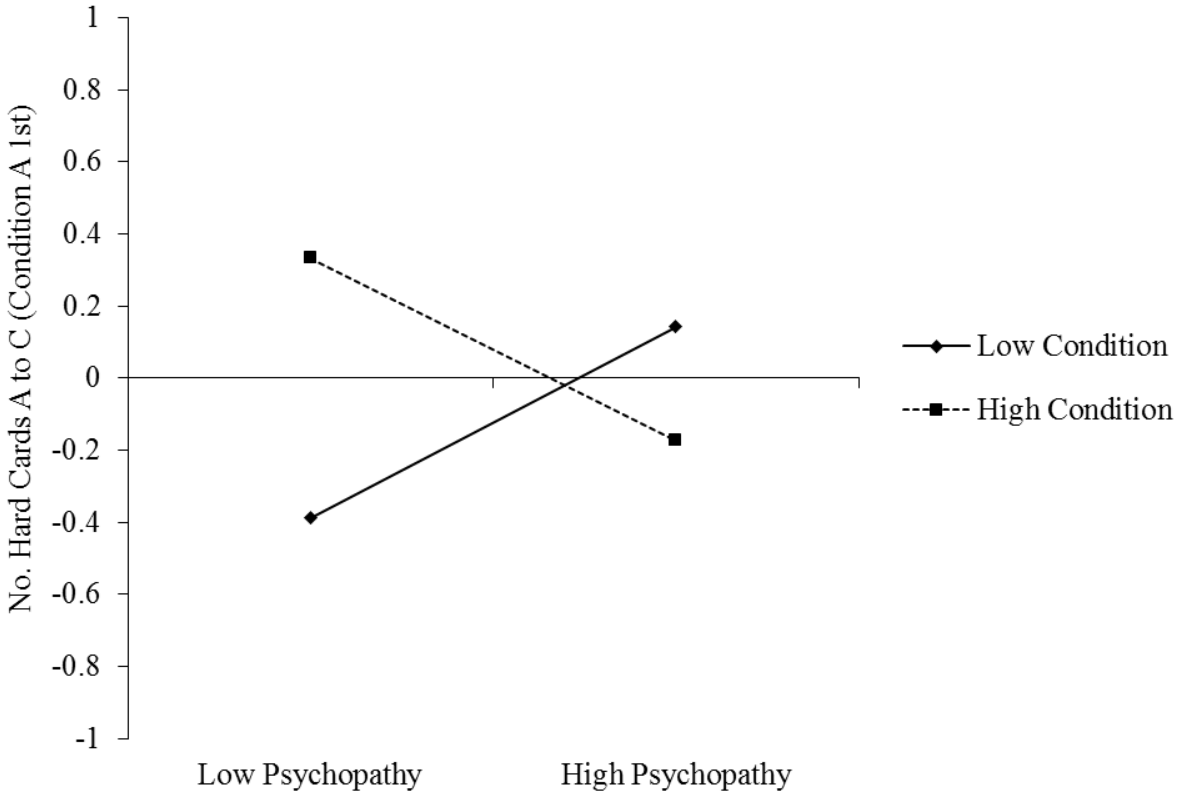


Figure 19. Interaction between bonding (high condition)/non-bonding (low condition) and psychopathy on the number of hard cards placed on the board in condition A (other-reward only) compared to condition C (self-reward only) for participants who completed condition A first.

The effect of bonding on the number of hard cards placed on the board in condition A compared to condition B was the only significant effect among the regressions examining the effect of Machiavellianism (Table 16). Expressly, those who bonded with their partner placed significantly fewer hard cards on the board in condition B than in condition A (Table 16).

Table 16. Regression of Machiavellianism on Risk for those who Completed Condition A First

	No. Hard A	Board Difficulty A	No. Hard Cards A to C	No. Hard Cards A to B	Board Difficulty A to C	Board Difficulty A to B
Machiavellianism	.096[-.162, .353]	.173[-.084, .431]	.164[-.088, .416]	.029[-.223, .282]	.145[-.114, .403]	.023[-.237, .282]
Condition	.145[-.100, .389]	.075[-.169, .319]	.121[-.119, .362]	**.254[.014, .493]***	.082[-.165, .329]	.162[-.085, .409]
Mach*Condition	-.093[-.350, .164]	-.044[-.302, .213]	-.181[-.433, .071]	.155[-.098, .408]	-.182[-.440, .076]	.143[-.117, .403]

*$p < .05$ +$p < .090$

3.6.2 Condition B First

Neither of the regressions examining the effect of Machiavellianism (Table 17) or narcissism (Table 18) on the indices of board difficulty were significant.

Table 17: Regression of Machiavellianism on Risk for those who Completed Condition B First

	No. Hard A	Board Difficulty A	No. Hard Cards A to C	No. Hard Cards A to B	Board Difficulty A to C	Board Difficulty A to B
Machiavellianism	-.043[-.426, .340]	-.056[-.438, .326]	-.188[-.569, .193]	-.209[-.589, .171]	-.154[-.548, .239]	-.171[-.558, .215]
Condition	-.046[-.352, .260]	-.093[-.400, .215]	.025[-.282, .333]	.016[-.291, .323]	-.003[-.319, .313]	-.024[-.332, .285]
Mach*Condition	-.018[-.401, .365]	.069[-.314, .451]	.092[-.289, .473]	.155[-.225, .536]	.128[-.266, .521]	.112[-.274, .449]

*$p < .05$ +$p < .090$

Table 18: Regression of Narcissism on Risk for those who Completed Condition B First

	No. Hard A	Board Difficulty A	No. Hard Cards A to C	No. Hard Cards A to B	Board Difficulty A to C	Board Difficulty A to B
Narcissism	-.076[-.471, .320]	-.115[-.510, .280]	-.134[-.560, .291]	-.067[-.463, .328]	-.201[-.646, .245]	-.122[-.515, .272]
Subj. Numeracy	-.035[-.378, .307]	-.008[-.349, .333]	-.012[-.383, .360]	-.109[-.451, .233]	-.087[-.471, .296]	-.187[-.536, .162]
Condition	.020[-.336, .377]	-.048[-.404, .307]	-.059[-.441, .322]	.045[-.311, .401]	-.096[-.489, .298]	-.036[-.399, .327]
Narc*Condition	-.077[-.473, .318]	-.075[-.470, .321]	.025[-.400, .451]	-.125[-.520, .270]	.023[-.423, .468]	-.089[-.482, .305]
Narc*Subj. Numeracy	.123[-.287, .511]	.114[-.296, .523]	.138[-.302, .577]	.212[-.198, .622]	.122[-.376, .621]	.317[-.107, .740]
Condition*Subj. Numeracy	.169[-.173, .511]	.213[-.128, .554]	.157[-.215, .528]	-.091[-.433, .251]	.152[-.232, .536]	-.015[-.365, .334]
Narc*Cond*Subj. Numeracy	-.232[-.642, .178]	-.189[-.599, .220]	.116[-.323, .556]	-.050[-.460, .360]	.138[-.360, .636]	-.067[-.491, .356]

*$p < .05$ +$p < .090$

However, the regression examining the effect of psychopathy indicated a significant effect such that those higher in psychopathy placed fewer hard cards on the board in condition A, placed more hard cards on the board in conditions C compared to condition A, placed more hard cards on the board in condition B than in condition A, and made the board more difficult in condition C than in condition A (Table 19). There was also a significant interaction between psychopathy and the activity participants completed with their partner on the number of hard cards placed on the board in condition A (Table 19).

Table 19: Regression of Psychopathy on Risk for those who Completed Condition B First

	No. Hard A	Board Difficulty A	No. Hard Cards A to C	No. Hard Cards A to B	Board Difficulty A to C	Board Difficulty A to B
Psychopathy	**-.482[-.808, -.125]***	-.312[-.693, .069]	**-.588[-.942, -.234]***	**-.525[-.867, -.184]***	**-.461[-.846, -.075]***	-.329[-.713, .056]
Obj. Numeracy	.235[-.051, .521]	.194[-.112, .500]	.248[-.040, .536]	**.252[-.022, .526]**$^{+}$	.148[-.166, .461]	.057[-.251, .364]
Condition	-.132[-.430, .166]	-.182[-.502, .137]	-.052[-.350, .247]	-.101[-.386, .184]	-.086[-.413, .241]	-.105[-.427, .217]
Psych*Condition	**.388[.031, .744]***	.268[-.114, .649]	**.462[.107, .816]***	**.438[.097, .780]***	.321[-.065, .706]	.286[-.099, .670]
Psych*Obj. Numeracy	**-.477[-.805, -.150]***	**-.426[-.776, -.077]***	**-.394[-.719, -.069]***	**-.607[-.920, -.293]***	**-.342[-.695, .011]**$^{+}$	**-.440[-.793, -.087]***
Condition*Obj. Numeracy	-.073[-.359, .213]	.043[-.263, .349]	-.056[-.344, .232]	**-.237[-.511, 0.37]**$^{+}$	.067[-.246, .380]	-.123[-.430, .185]
Psych*Cond*Obj. Numeracy	-.001[-.328, .327]	.052[-.298, .402]	.013[-.312, .338]	.125[-.189, .483]	.087[-.266, .440]	.013[-.340, .366]

*$p < .05$ +$p < .090$

Specifically, those who did not bond with their partner and were lower in psychopathy placed more hard cards on the board in condition A than did those who did not bond with their partner and were higher in psychopathy (Figure 20). However, among those higher in psychopathy, those who bonded placed more hard cards on the board in condition A than those who did the neutral activity with their partner (Figure 20).

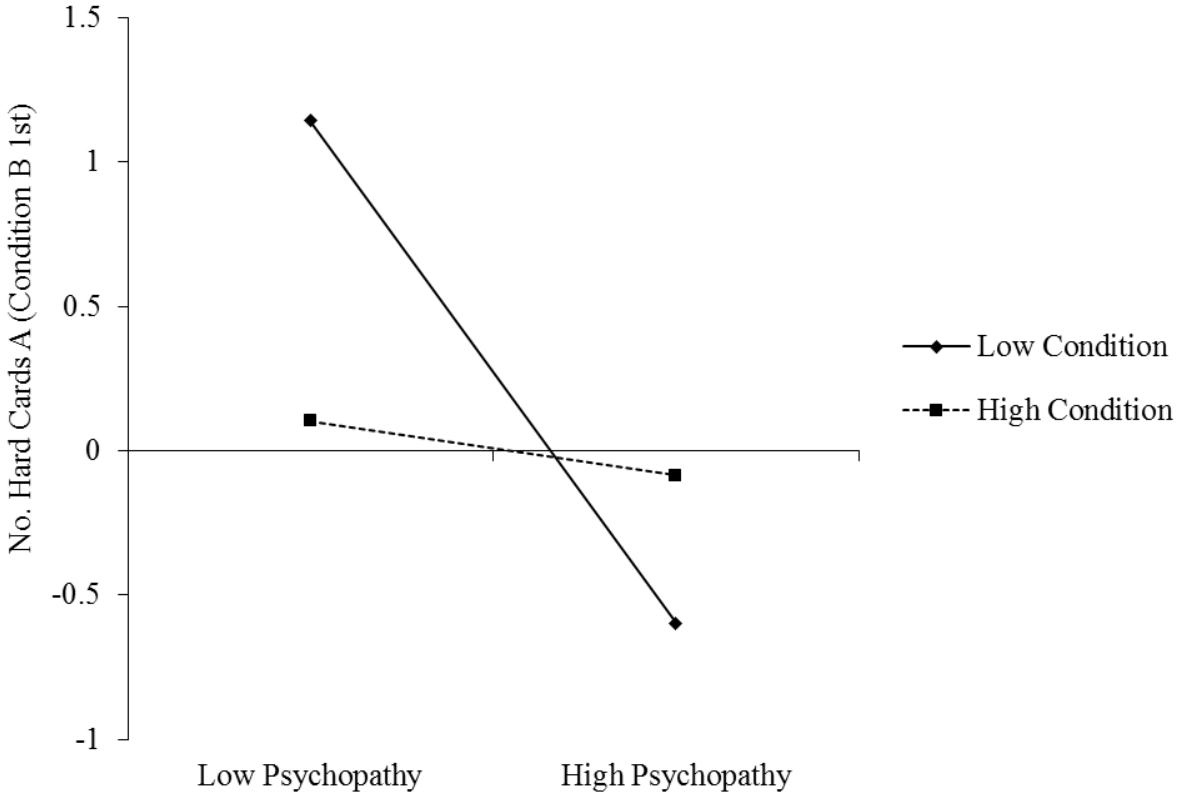


Figure 20. Interaction between bonding (high condition)/non-bonding (low condition) and psychopathy on the number of hard cards placed on the board in condition A (other-reward only) for participants who completed condition B (self- and other-reward asymmetry) first

The interaction between psychopathy and activity completed by participants was also significant for the difference in the number of hard cards placed on the board in condition A compared to condition C (Table 19). Those who did not bond with their partner and were lower in psychopathy placed more hard cards on the board in condition A compared to condition C than did those who did not bond with their partner and were higher in psychopathy (Figure 21). In contrast, for those who bonded with their partner, psychopathy did not appear to change the difference in the number of hard cards placed on the board in condition A compared to condition C (Figure 21).

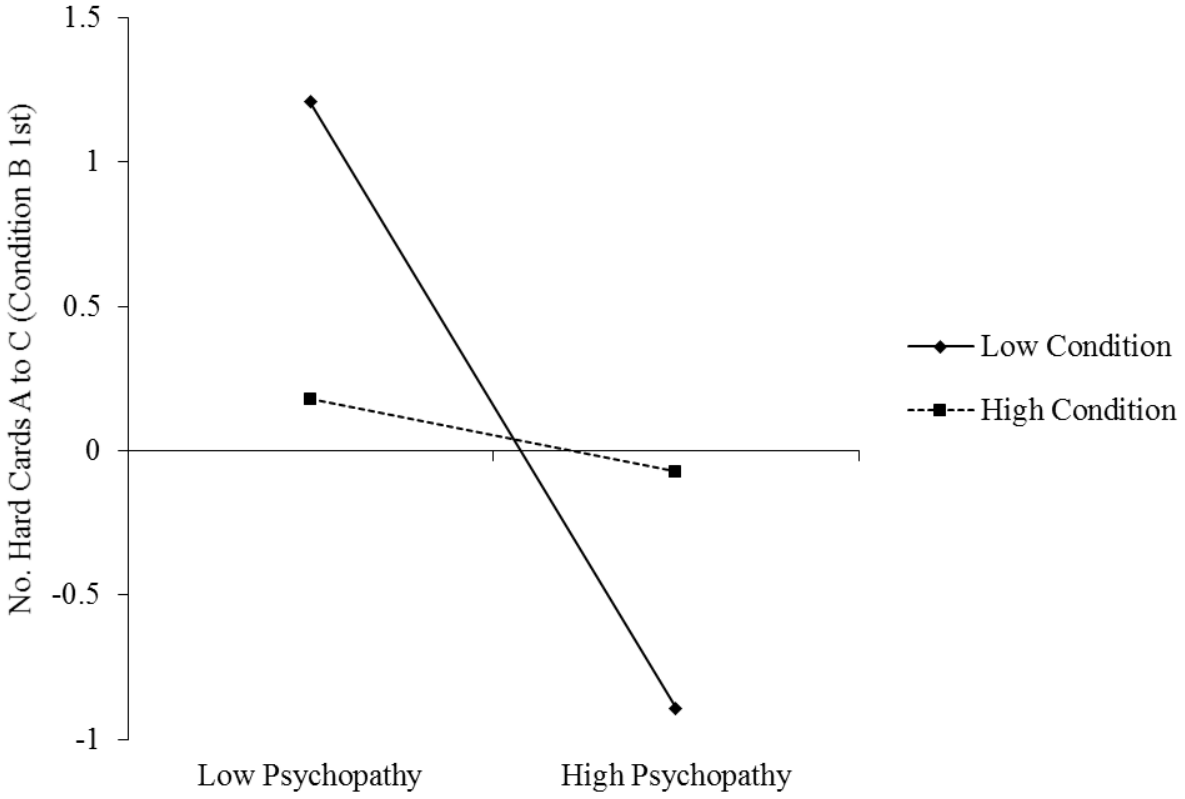


Figure 21. Interaction between bonding (high condition)/non-bonding (low condition) and psychopathy on the number of hard cards placed on the board in condition A (other-reward only) compared to C (self-reward only) for participants who completed condition B (self- and other-reward asymmetry) first

The interaction between psychopathy and activity was also significant for the difference in the number of hard cards placed on the board in condition A compared to condition B (Table 19). Again, those who did not bond with their partner and were lower in psychopathy placed more hard cards on the board in condition A compared to condition B than did those who did not bond with their partner and were higher in psychopathy (Figure 22).

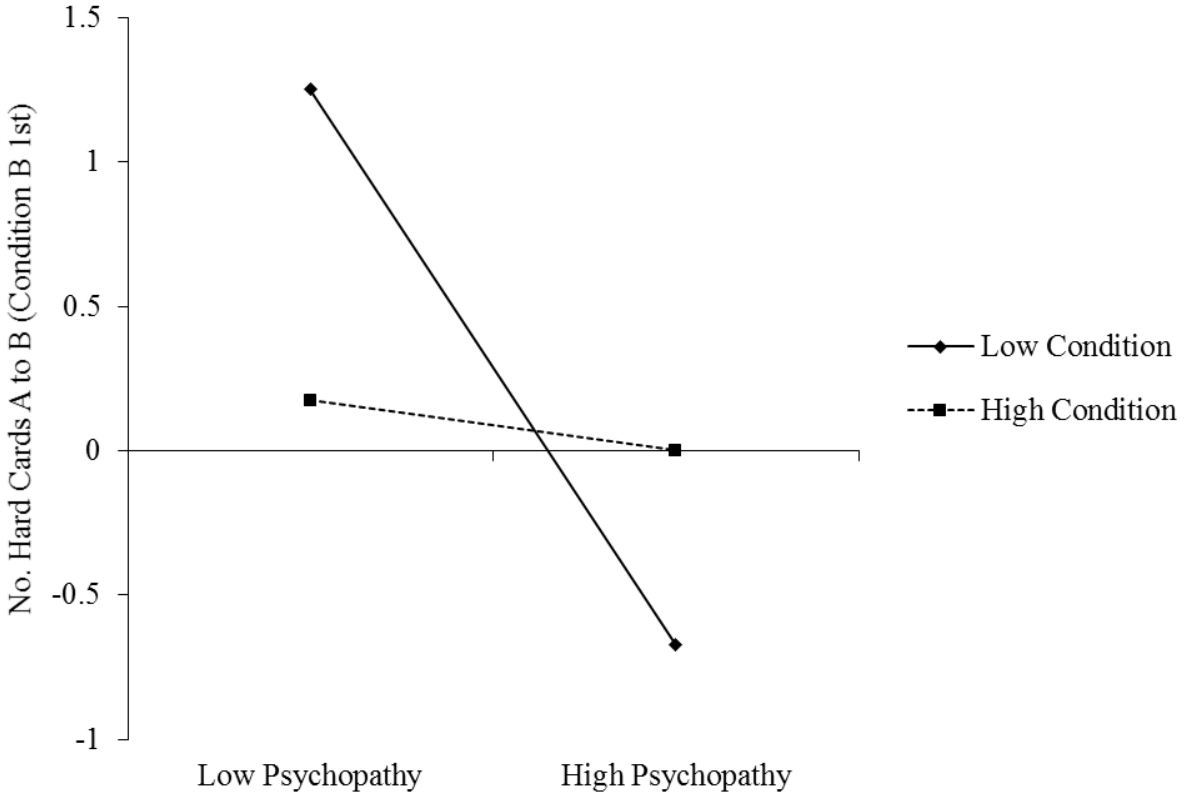


Figure 22. Interaction between bonding (high condition)/non-bonding (low condition) and psychopathy on the number of hard cards placed on the board in condition A (other-reward only) compared to condition B (self- and other-reward asymmetry) for participants who completed condition B first

There were also several significant effects for the interaction between psychopathy and objective numeracy including: number of hard cards placed on the board in condition A, the difficulty of the board in condition A, the difference in the number of hard cards placed on the board in condition A compared to condition C, the difference in the number of hard cards placed on the board in condition A compared to condition B, and the difference in the difficulty of the board in condition A compared to condition B (Table 19). Expressly, those who were higher in objective numeracy and lower in psychopathy placed more hard cards on the board in condition A compared to those higher in objective numeracy and psychopathy (Figure 23). On the other

hand, there was not an observable difference based on psychopathy in the number of hard cards placed on the board in condition A based on objective numeracy (Figure 23). A similar trend was exhibited for the difficulty of the board in condition A (Figure 24).

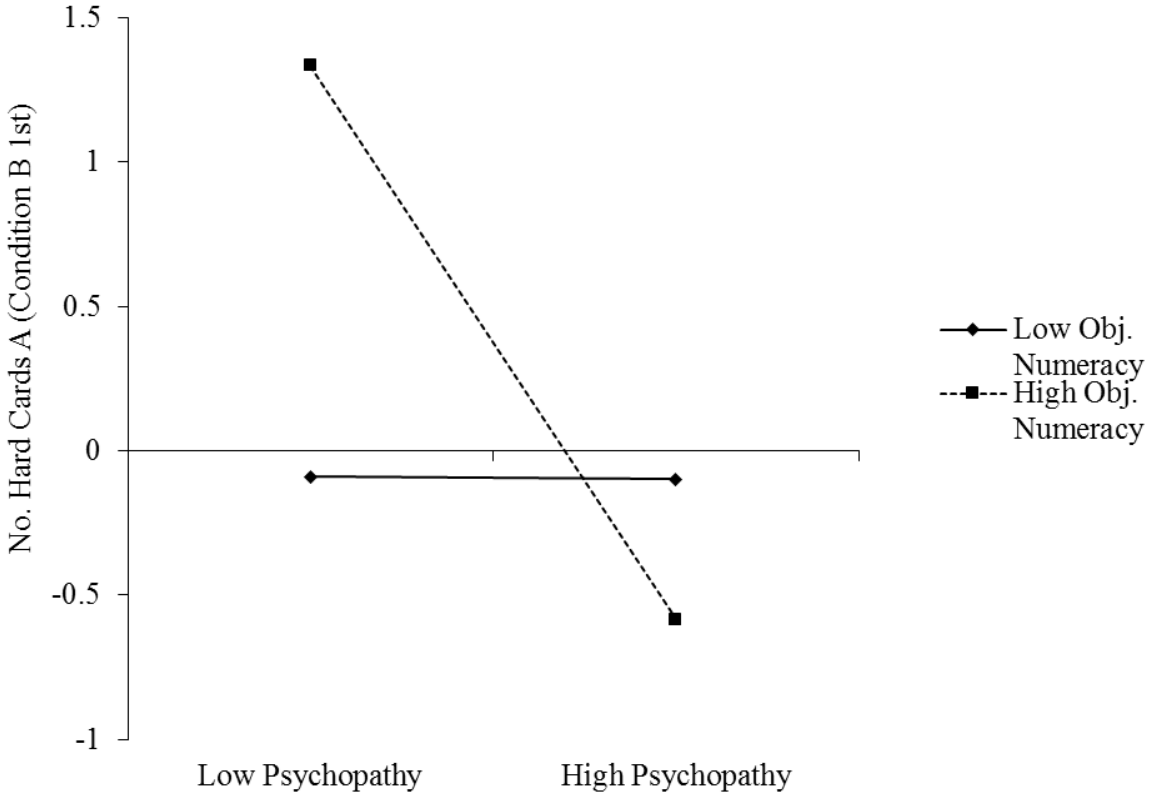


Figure 23. Interaction between bonding (high condition)/non-bonding (low condition) and psychopathy on the number of hard cards placed on the board in condition A (other-reward only) for participants who completed condition B first (self- and other-reward asymmetry)

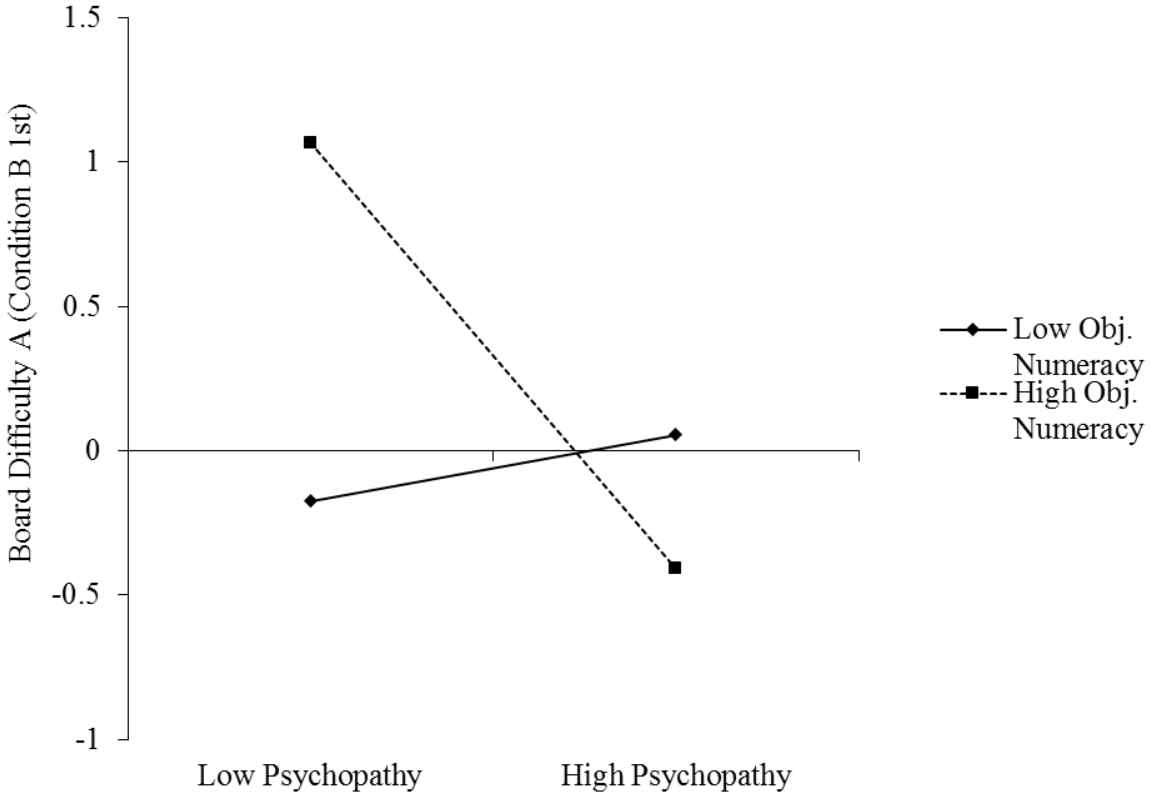


Figure 24. Interaction between psychopathy and objective numeracy on the difficulty of the board in condition A (other-reward only) for participants who completed condition B (self- and other-reward asymmetry) first

Additionally, for those lower in psychopathy, those who were lower in objective numeracy placed fewer hard cards on the board in condition A compared to condition C than did those higher in objective numeracy (Figure 25). Those higher in objective numeracy and lower in psychopathy also placed significantly more hard cards on the board (Figure 26) and created a more difficult board (Figure 27) in condition A compared to condition B.

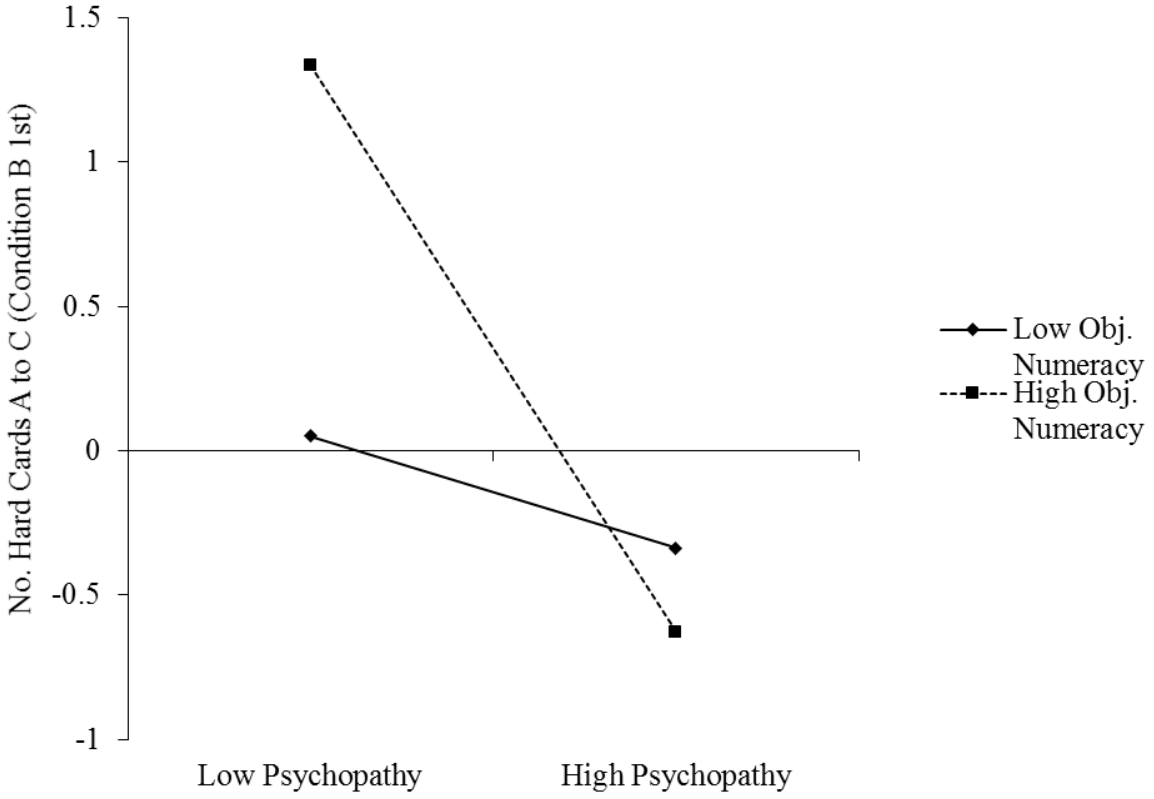


Figure 25. Interaction between psychopathy and objective numeracy on the number of hard cards placed on the board in condition A (other-reward only) compared to condition C (self-reward only) for participants who completed condition B first

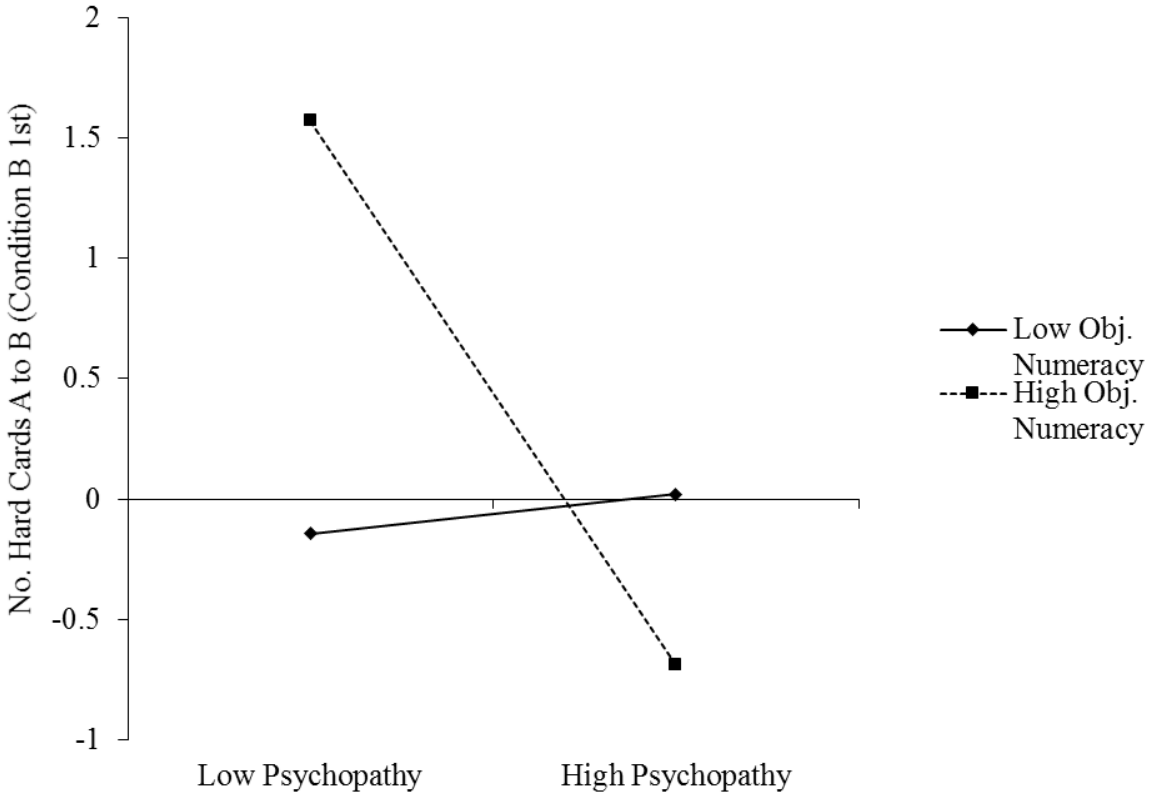


Figure 26. Interaction between psychopathy and objective numeracy on the number of hard cards placed on the board in condition A (other-reward only) compared to condition B (self- and other-reward asymmetry) for participants who completed condition B first

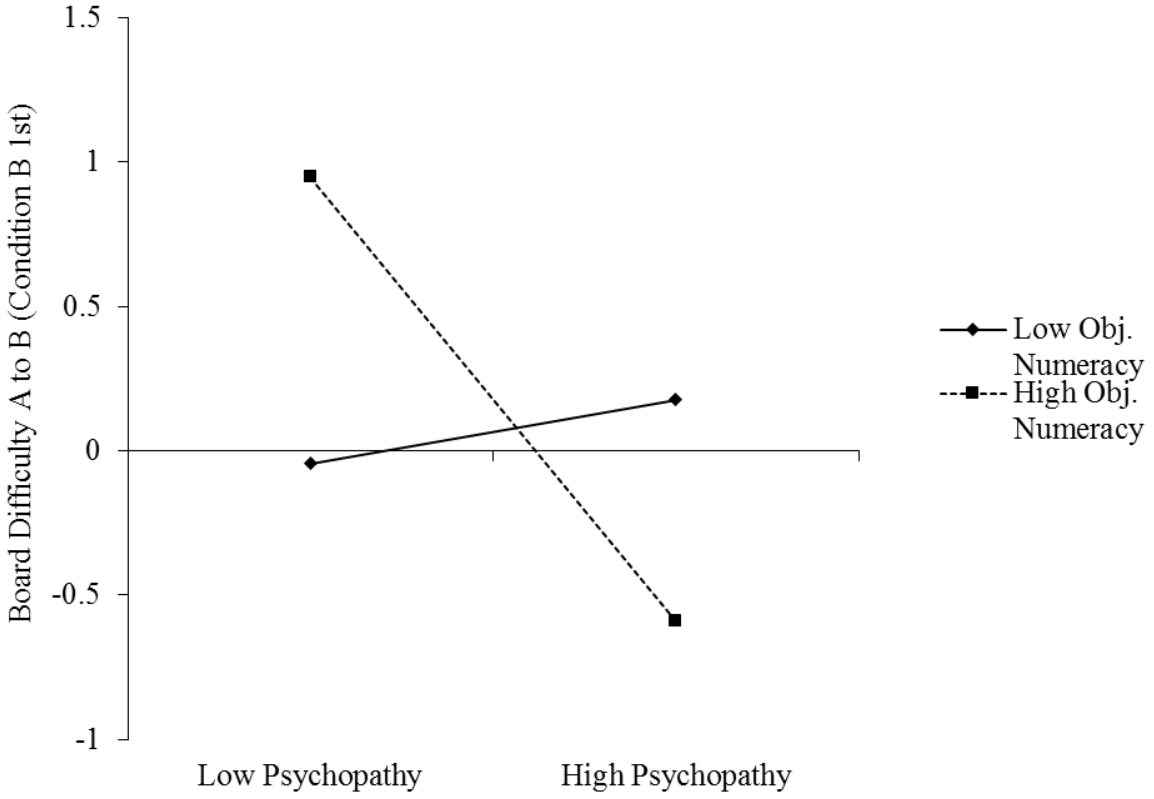


Figure 27. Interaction between psychopathy and objective numeracy on the difficulty of the board in condition A (other-reward only) compared to condition B (self- and other-reward asymmetry) for participants who completed condition B first

There was also a marginally significant effect such that those higher in objective numeracy and lower in psychopathy placed more hard cards on the board in condition A compared to condition C than did those higher in psychopathy and objective numeracy (Table 19; Figure 28).

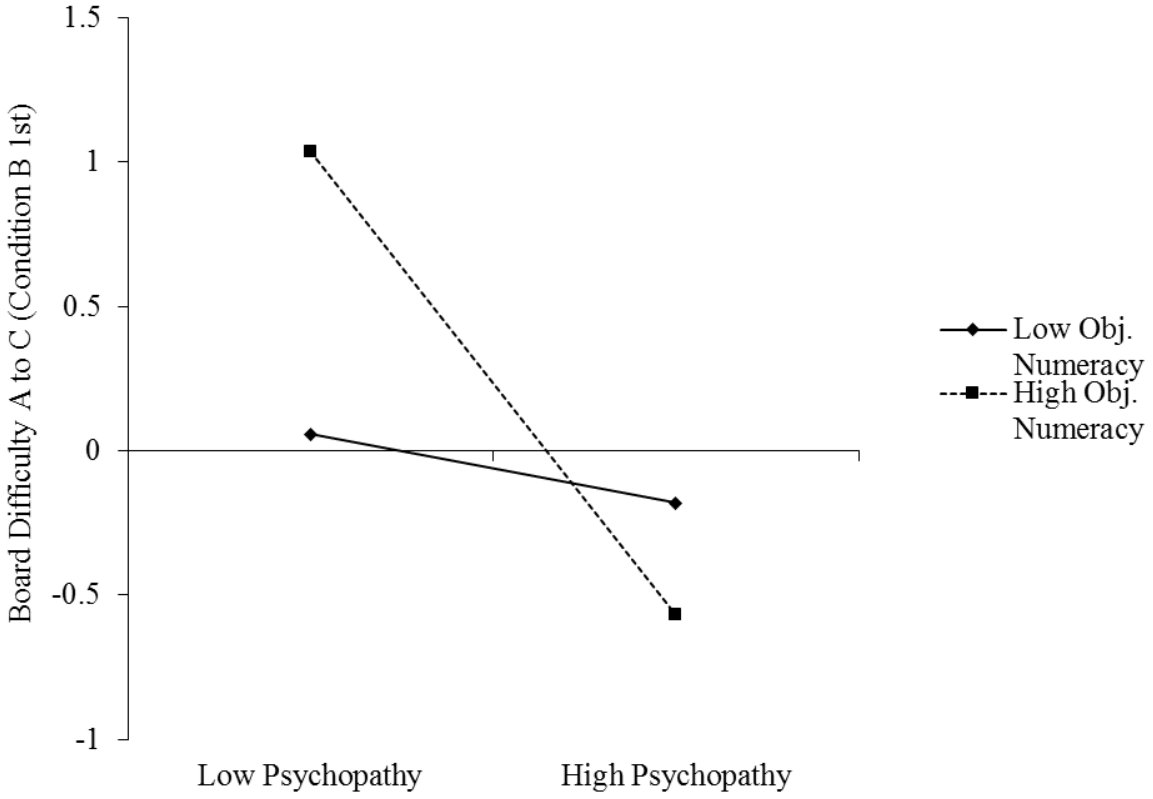


Figure 28. Interaction between psychopathy and objective numeracy on the difficulty of the board in condition A (other-reward only) compared to condition C (self-reward only) for participants who completed condition B (self- and other-reward asymmetry) first

A significant interaction between activity completed by participants and objective numeracy on the number of hard cards placed on the board in condition A compared to condition B was also observed (Table 19). Those who engaged in the neutral activity with their partner and were high in subjective numeracy placed more hard cards on the board in condition A compared to condition B than did those who were lower in subjective numeracy (Figure 29). In contrast, there was not a difference in the number of hard cards placed on the board in condition A compared to condition B among those who bonded with their partner based on objective numeracy (Figure 29).

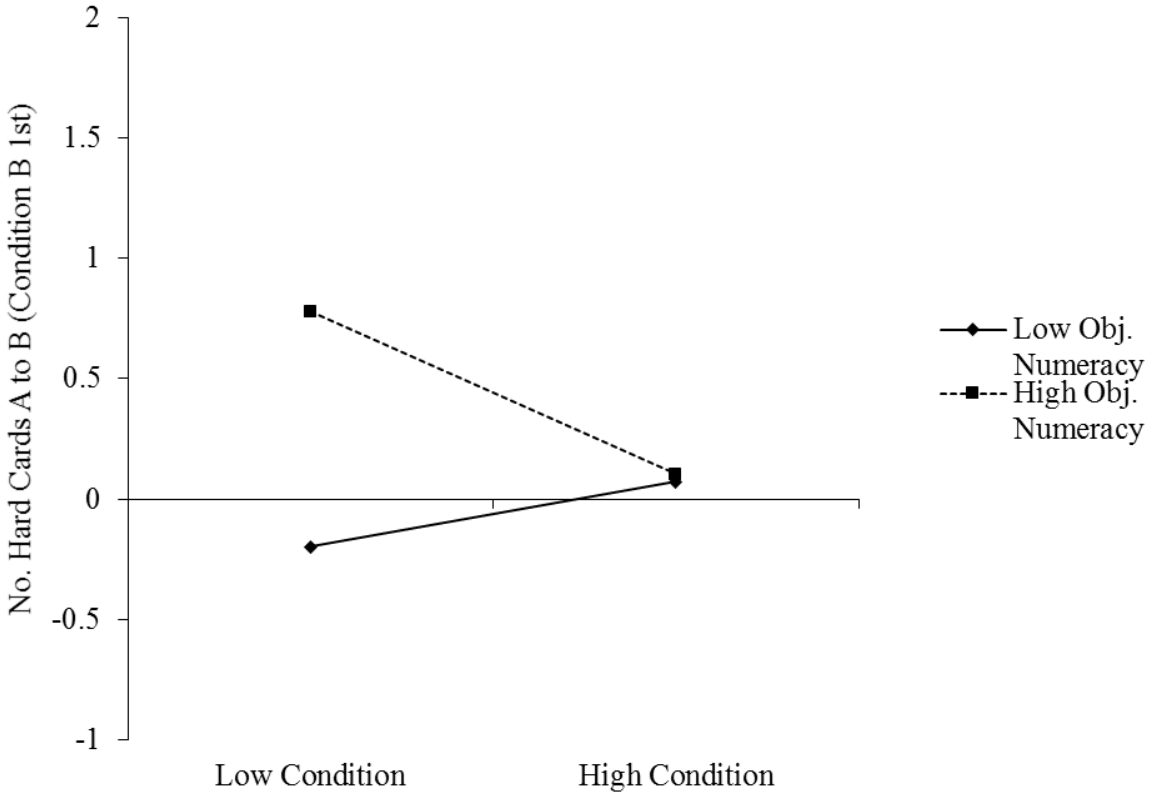


Figure 29. Interaction between bonding (high condition)/non-bonding (low condition) and objective numeracy on the number of hard cards placed on the board in condition A (other-reward only) compared to condition B (self- and other-reward asymmetry) for participants who completed condition B first

Finally, there was a marginally significant effect of objective numeracy such that those higher in objective numeracy placed more hard cards on the board in condition A than in condition B (Table 19).

3.7 Effect of Empathy

As previous studies have found a significant effect of empathy on decisions made for oneself versus others (e.g., O'Connell et al., 2013), the effect of empathy was also examined using a series of linear regressions. There was a significant effect such that those higher in empathy placed fewer hard cards on the board in condition B (Table 20).

Table 20: Regression of Empathy on Risk for Each Scenario

	No. Hard A	No. Hard B	No. Hard C	Board Difficulty A	Board Difficulty B	Board Difficulty C
Empathy	-.127[-.304, .050]	**-.195[-.370, -.021]***	-.046[-.229, .136]	-.141[-.319, .038]	-.111[-.292, .069]	-.052[-.246, .141]
Condition	.146[-.030, .321]	-.138[-.311, .035]	-.036[-.218, .146]	.093[-.084, .270]	-.100[-.277, .077]	-.061[-.246, .123]
Emp*Condition	-.084[-.261, .092]	.056[-.119, .231]	-.038[-.220, .145]	.011[-.168, .189]	.119[-.062, .299]	.041[-.153, .234]

*$p < .05$

There was also a significant effect of condition such that those in the bonding condition placed more hard cards on the board in condition A than in condition B (Table 21). None of the other effects were significant.

Table 21: Regression of Empathy on Risk Differences Between Each Scenarios

	No. Hard Cards A to C	No. Hard Cards A to B	No. Hard Cards B to C	Board Difficulty A to C	Board Difficulty A to B	Board Difficulty B to C
Empathy	-.069[-.249, .111]	.069[-.105, .243]	-.132[-.311, .048]	-.086[-.279, .107]	-.013[-.195, .168]	-.081[-.275, .112]
Condition	.141[-.039, .321]	**.233[.060, .405]***	-.085[-.264, .095]	.112[-.072, .297]	**.157[-.022, .335]**$^{+}$	-.032[-.216, .153]
Emp*Condition	-.036[-.217, .144]	-.114[-.288, .060]	.070[-.110, .250]	-.033[-.226, .160]	-.099[-.281, .082]	.048[-.146, .241]

*$p < .05$ $^{+}p < .090$

3.7.1 Effect of Empathy by Order of Conditions

For participants who completed condition A first, there was a significant interaction between empathy and whether participants bonded with their partner on the difference in the number of hard cards placed on the board in condition A compared to condition B (Table 22).

Table 22: Regression of Empathy on Risk for those who Completed Condition A First

	No. Hard A	Board Difficulty A	No. Hard Cards A to C	No. Hard Cards A to B	Board Difficulty A to C	Board Difficulty A to B
Empathy	-.052[-.318, .213]	-.052[-.318, .213]	-.048[-.316, .221]	.084[-.160, .328]	.019[-.260, .298]	-.016[-.274, .241]
Condition	.056[-.192, .305]	.056[-.192, .305]	.109[-.143, .361]	**.246[.018, .475]***	.082[-.178, .342]	.144[-.099, .386]
Emp*Condition	.059[-.207, .324]	.059[-.207, .324]	.082[-.186, .350]	**-.288[-.532, -.044]***	.073[-.206, .352]	**-.271[-.529, -.014]***

*$p < .05$

Specifically, those who were low in empathy and bonded with their partner placed fewer hard cards on the board in condition B than in condition A compared to those who did not bond

with their partner (Figure 30). However, there was not a difference in the number of hard cards placed on the board in condition A compared to condition B among those higher in empathy (Figure 30).

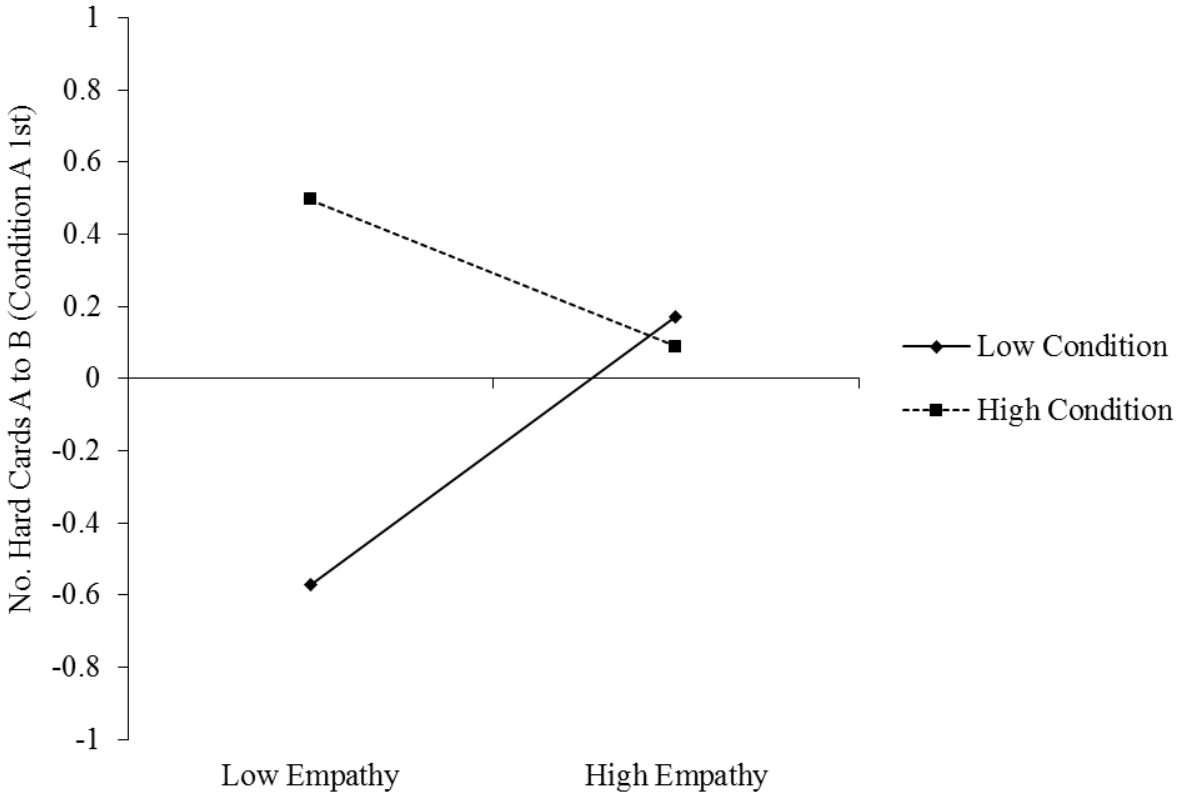


Figure 30. Interaction between bonding (high condition)/non-bonding (low condition) and empathy on the number of hard cards placed on the board in condition A (other-reward only) compared to condition B (self- and other-reward asymmetry) for participants who completed condition A first

This same trend was observed for the interaction between empathy and activity participants completed with their partner on the difference in board difficulty in condition A compared to condition B (Table 22; Figure 31).

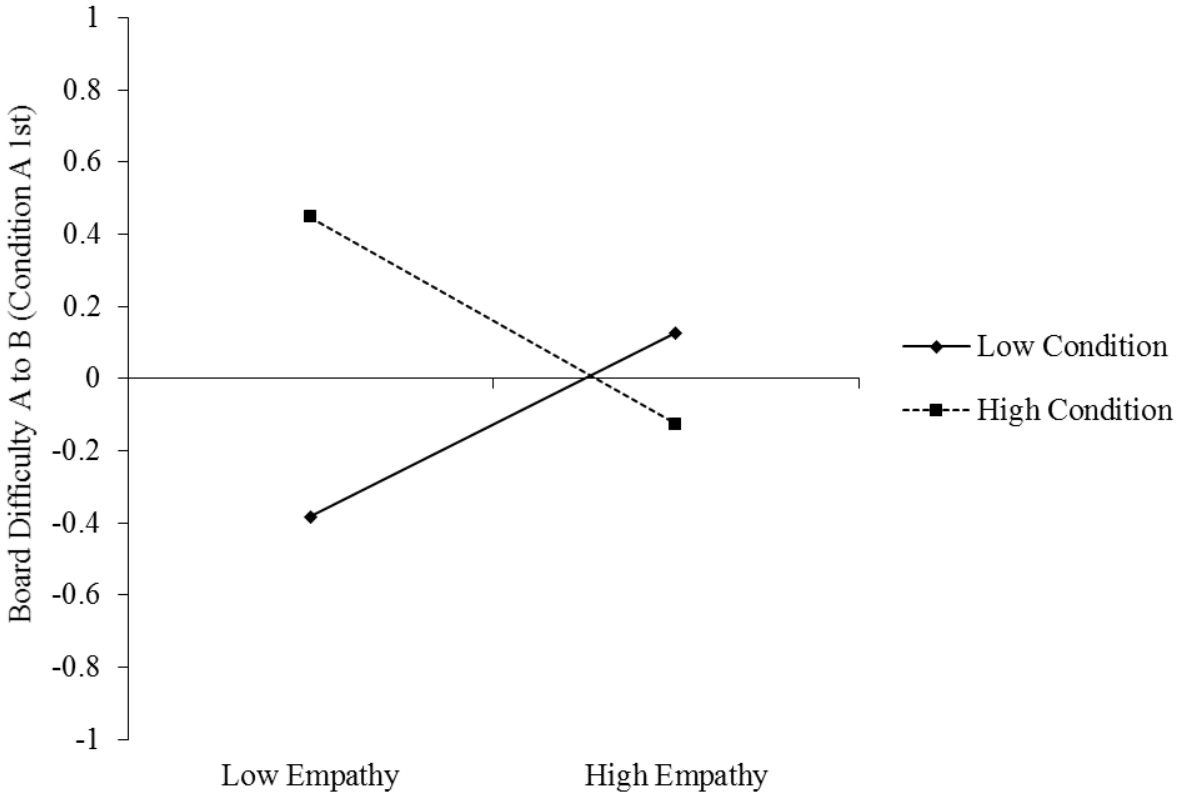


Figure 31. Interaction between bonding (high condition)/non-bonding (low condition) and empathy on the difficulty of the board in condition A (other-reward only) compared to condition B (self- and other-reward asymmetry) for participants who completed condition A first

Activity was also significantly related to the number of hard cards placed on the board in condition A compared to condition B such that those who bonded with their partner placed more hard cards on the board in condition A than condition B (Table 22).

None of the regressions examining the effect of empathy, activity completed by participants, or the interaction between these variables on indices of board difficulty when participants completed condition B first were significant (Table 23).

Table 23: Regression of Empathy on Risk for those who Completed Condition B First

	No. Hard A	Board Difficulty A	No. Hard Cards A to C	No. Hard Cards A to B	Board Difficulty A to C	Board Difficulty A to B
Empathy	-.021[-.324, .282]	-.112[-.418, .194]	.146[-.158, .450]	.034[-.273, .341]	-.033[-.373, .308]	-.059[-.373, .255]
Condition	-.050[-.354, .254]	-.083[-.390, .224]	-.006[-.314, .301]	.031[-.277, .339]	.003[-.321, .327]	-.023[-.334, .288]
Emp*Condition	-.165[-.468, .138]	.006[-.300, .312]	-.161[-.465, .143]	-.076[-.383, .231]	-.136[-.476, .204]	-.110[-.424, .204]

3.8 Effect of Control Variables

The effect of several control variables on the Independent Variables of interest and Dependent Variables was assessed. First, the effect of participants' perception of their chance and their partner's chance of winning the raffle was examined using a series of correlations. These analyses indicated that there was not a significant relationship between the participants' perception of their partner's chance of winning the raffle and any of the personality measures (e.g., psychopathy, empathy), numeracy measures (e.g., subjective numeracy), or dependent variables (i.e., board difficulty), p's > 0.05 (Table 24).

Table 24: Correlation of Self-report and Dependent Variables with Perception of Partner's/Self Chance of Winning Raffle

	Perception of Partner's Chance of Winning Raffle	Perception of Self Chance of Winning Raffle
1. Psychopathy	.135	**.263***
2. Narcissism	.010	.146
3. Machiavellianism	-.115	-.079
4. Obj. Numeracy	-.063	-.081
5. Subj. Numeracy	-.056	-.068
6. Empathy	-.140	**-.240***
7. No. Hard A	.111	**.190***
8. No. Hard B	-.026	**.064***
9. No. Hard C	-.023	.000
10. Board Difficulty A	.083	**.197***
11. Board Difficulty B	-.011	.072
12. Board Difficulty C	-.037	.009
13. No. Hard Cards A to C	.111	.092
14. No. Hard Cards A to B	.109	.149
15. No. Hard Cards B to C	-.008	.061
16. Board Difficulty A to C	.097	.097
17. Board Difficulty A to B	.078	.155
18. Board Difficulty B to C	.029	.081

*$p < .05$

There was, however, a significant positive relationship between psychopathy and participants' perception of their chance of winning the raffle such that those higher in

psychopathy thought they had a greater chance of winning the raffle [5](Table 24). There was also a significant negative relationship between participants' perception of their chance of winning the raffle and empathy such that those with higher levels of empathy thought they had less chance of winning the raffle (Table 24). There were also several positive correlations between participants' perception of their chance of winning the raffle and several of the dependent variables. Specifically, those who thought they had a greater chance of winning the raffle placed more hard cards on the board in conditions A and B and also made the board more difficult in condition A (Table 24).

The perceived importance of the raffle winnings to the participant's partner was also examined using a one-way ANOVA. This analysis indicated that there was not a significant relationship between the perceived importance of the raffle winnings to the participant's partner on any of the personality variables (e.g., narcissism) or dependent variables (e.g., number of hard cards placed on the board in condition B), p's > 0.05. However, there was a significant relationship between the perceived importance of the raffle to the participant's partner and objective ($F(4, 122) = 4.246$, $p = 0.003$) and subjective ($F(4, 122) = 4.115$, $p = 0.004$) numeracy. Specifically, those who rated the importance of the raffle winnings to their partner as 'Not at all Important' ($M = 2.438$; $SD = 0.684$) had significantly lower subjective numeracy scores than those who rated the importance as 'Moderately Important' ($M = 3.952$; $SD = 1.009$) or 'Slightly Important' ($M = 4.177$; $SD = 1.165$). Additionally, those who rated the importance of the raffle winnings to their partner as 'Not at all Important' (M = 0.417; SD = 0.247) had significantly lower objective numeracy scores compared to those who rated the importance as 'Very

[5] As there was a significant relationship between psychopathy and participants' perceived chance of winning the raffle, I conducted a series of linear regressions examining the interaction between psychopathy and perceived chance of winning on the indices of board difficulty. However, none of the interactions were significant, p's > 0.05.

Important' (M = 0.647; SD = 0.230), 'Moderately Important' (M = 0.734; SD = 0.188), and 'Slightly Important' (M = 0.759; SD = 0.201).

Participants also reported the importance of the raffle winnings to themselves. A one-way ANOVA revealed that this variable was not significantly related to any of the personality measures (e.g., empathy) or numeracy measures (e.g., subjective numeracy), p's > 0.05. There was, however, a significant relationship between the importance of the raffle winnings to the participant and the difference between the board difficulty in condition B and condition C, $F(4, 117) = 2.469$, $p = 0.049$. However, a post-hoc analysis (Tukey's HSD) did not reveal any significant differences in the difference between the board difficulty in condition B and condition C based on self-rated importance of the raffle winnings, p's > 0.05. None of the other analyses examining the relationship between the importance of the raffle winnings to the participant and the other dependent variables were significant, p's > 0.05.

In order to assess their awareness of the circumstances of the investment scenario, participants were asked whether they were aware they were making decisions in the investment scenario for raffle entries into an actual raffle for three prizes of $50. The majority of participants reported they were aware they were making decisions to earn raffle entries for an actual raffle (58.4%). The effect of this variable on the independent and dependent variables was also examined using a one-way ANOVA. There were no significant differences in personality traits (e.g., Machiavellianism), numeracy (e.g., subjective) or any of the dependent variables (e.g., number of hard cards on the board in condition B) based on whether participants reported being aware of the raffle, p's > 0.05.

As previous studies have identified a link between narcissism and risk taking mediated by overconfidence (e.g., Campbell et al., 2004) two questions were asked to each participant

addressing their confidence that the third participant (i.e., someone they never met) would answer a hard and an easy question correctly. The relationship between these responses and narcissism were examined using a two-way ANOVA. This analysis indicated that there was not a significant relationship between narcissism and confidence in a correct response to a hard ($F(6, 106) = 0.795$, $p = 0.576$) or easy ($F(4, 106) = 0.310$, $p = 0.870$) question. There was also not an interaction between confidence in a correct response to a hard or easy question on narcissism, $F(10, 106) = 0.832$, $p = 0.599$.

Before each condition, the researcher asked participants four comprehension questions to ensure that participants understood the reward structure for each condition. The majority of participants answered each question correctly and the number of incorrect responses lessened with each subsequent question (Figure 32). This indicates that participants understood the reward structure of each round before setting up the board.

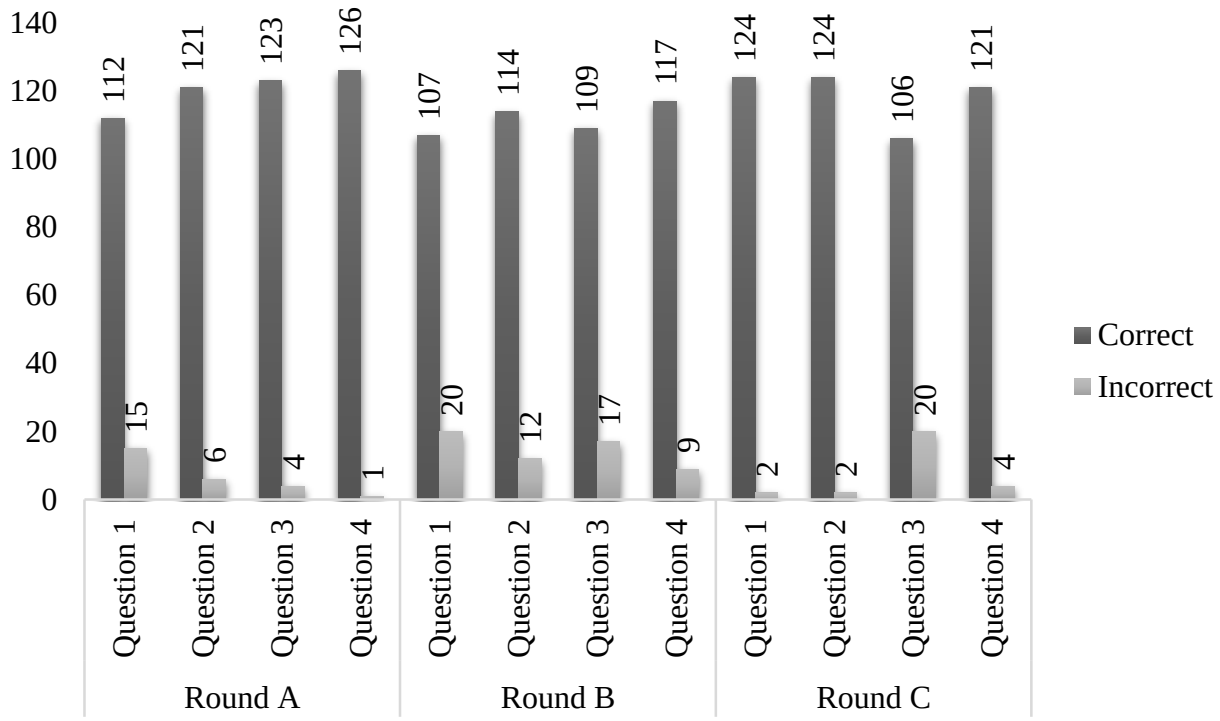


Figure 32. Frequency of correct and incorrect questions for the four comprehension questions asked before each round

Participants were also asked whether they knew their partner before the study and whether they had heard anything about the study before participating. Only three participants reported having heard anything about the study before participating. These participants were asked to elaborate on what they heard about the study and examination of these responses indicated these participants had not heard anything about the study relevant to the outcomes of interest. Fifteen participants reported having met their partner before the study session and were asked to explain how they knew their partner. Examination of these responses indicated that the majority of participants had seen or taken a class with their partner but were not overly familiar with their partner. However, four participants were deemed to have a close prior relationship with each other and were removed from analysis. Specifically, two of the participants were in a romantic relationship and the other two participants knew each other since high school.

Chapter 4: Discussion

4.1 Self and Other Decision-Making

One of the main goals of this study was to examine the decision making process of individuals in general when asked to make a decision involving risk for themselves, another person, or involved balancing the risk assigned to another person for the benefit to the self. In support of the first hypothesis, individuals made riskier choices for others when they benefited from greater risk than they did when only the other person (i.e., other-reward only) or only they (i.e., self-reward only) would profit or suffer a loss (H1). This finding is not readily interpretable according to the social values explanation of self and other decision asymmetry insofar as making riskier decisions for others in order for the self to benefit is not generally socially valued (Stone & Allgaier, 2008). In general, there is outrage when individuals harm others, who have trusted them, in order to get ahead. Take for example, the case of the 2008 subprime mortgage crisis. Once revealed, individuals were so upset at the selfish actions of bankers that it sparked a wave of protests (e.g., About, n.d.). Additionally, one might argue that individuals are not making decisions for others in this case so much as they are making decisions for themselves. Nevertheless, this does not assist in understanding the underlying reasons for this decision outcome. Instead the risk-as-feelings hypothesis and cognitive hypothesis provide more interpretable understanding of this finding.

Considering this finding from a risk-as-feelings perspective, individuals are likely to experience a greater emotional response to the potential for self-reward than other-consequence due to their distance from the other person (Loewenstein et al., 2001). This might then lead individuals to differentially weighting aspects of the decision, such that the individual weights the benefit to the self, more highly than the consequence to their partner (Beisswanger et al.,

2003; Lu et al., 2012). In having the benefit to the self and risk to another directly in opposition, this finding that individuals made riskier decisions for others when they benefitted from said risk highlights this difference in the decision making process for oneself versus another. If, for example, individuals weighted the aspects of a decision similarly and had a similar emotional response to consequences when making choices for others, there should not be a difference in this condition. As in the self-reward only and other-reward only conditions, the decision involving a self- and other-reward asymmetry still involves making a decision of whether to risk more for a potentially larger gain. In this way, were there no difference between self-reward and other-reward decision making, individuals should not make significantly different decisions in this condition than when the risks and rewards are all borne by one person. In this way, the finding that there was a difference lends support to the risk-as-feelings hypothesis and the cognitive hypothesis.

However, in contrast to previous findings and there was not a significant difference in risk between the other-reward only and self-reward only. This contradicts previous findings that individuals tend to make riskier decisions for others than for themselves (e.g., Andersson et al., 2013) and that this results from individuals engaging in different decision making processes when making decisions for others (e.g., Lowenstein et al., 2001; Polman, 2010). Additionally, contrary to the second hypothesis, there was not a significant effect of bonding on decisions made across conditions (H2). Put another way, how close participants felt to their partner did not affect the level of risk participants assigned to their partner in either the other-reward only condition or the self- and other-reward asymmetry condition. Thereby contradicting contradicts previous findings that individuals make more similar decisions to themselves when making a decision for a close rather than distant other (e.g., Livitan et al., 2008).

One explanation for these contradictory is a difference in methodology, in that previous studies have largely relied on having the participant imagine the other person for whom they are making a decision (e.g., Albrecht et al., 2010; Livitan et al., 2008; Trump et al., 2014). In contrast, participants in this study met their partner before making decisions for them. Although participants engaged in different activities during their time together, it is possible that meeting their partner who was highly similar to themselves (e.g., went to the same university, was also taking a psychology course) caused them to use more similar emotional response when making decisions for themselves and their partner. In fact, a previous study found that participants made decisions more similar to the ones made for themselves for another person who they were told attended the same (versus other) university (Livitan et al., 2008). In this way, even participants who did not bond with their partner may have perceived the other person as similar enough to themselves to use similar cognitive processes or experience a more similar emotional reaction to consequences for their partner when making decisions on their behalf.

Nevertheless, the hypothesized effect of condition order was supported (H3). When participants completed the self- and other- reward asymmetry condition first, they did make significantly more risky decisions in the subsequent condition in which the other person would suffer the consequence of any risky decision. This supports the idea that individuals anchor their decisions for others to previous decisions made for themselves. Previous research has shown that individuals anchor decisions solely affecting another person to decisions previously made that solely affected themselves (Faro & Rottenstreich, 2006). The anchoring effect found in this study then extends this finding in demonstrating this anchoring effect even when the initial decision affects another person as much as oneself. It appears then that individuals will anchor

decisions for others to decisions made previously that involved themselves even if this initial situation affected others as well as themselves.

4.2 The Dark Triad

The other main goal of this study was to examine the way impersonally manipulative traits affect the way individuals balance self- versus other-risk under three scenarios: (1) when another person bears the risk and reward associated with a decision, (2) when the self-benefits from making a risky decision for someone else, and (3) when the self bears the risk and reward associated with a decision. In partial support of the hypothesis that those higher in narcissism would make riskier decisions for others other-reward and self- and other-reward asymmetry conditions (H4), those higher in narcissism made riskier decisions for their partner when they benefitted from the increased risk (i.e., self- and other-reward asymmetry). Moreover, this increased risk in the self- and other-reward asymmetry condition was greater than the other-reward only (i.e., the other person bears all costs and benefits from the outcome) and self-reward only (i.e., the self bears all costs and benefits from the outcome) conditions. That those higher in narcissism made selfish decisions supports previous findings that individuals higher in narcissism are more self- as opposed to other- focused (e.g., Konrath et al., 2009). Expressly, as those higher in narcissism are more concerned with self-relevant outcomes, they will prioritize the potential for self-benefit over concerns about the consequences to others.

There was also some evidence that those higher in narcissism made riskier decisions for their partner in the other-reward only condition than they did in the self-reward only condition; though this was only significant for the number of hard cards on the board, and not for the difficulty of the board. Expressly, the risk-as-feelings hypothesis posits that individuals make riskier decisions for others due to a decreased emotional response to potential consequences

(Lowestein et al., 2001). Additionally, those higher in narcissism already tend to perceive themselves as more distant from others. Thus, the general tendency of individuals to discount consequences for others coupled with the increased distance from others perceived by narcissists might lead to greater discounting of consequences for others among those higher in narcissism. This discounting of consequences coupled with the tendency of those higher in narcissism to exhibit greater sensitivity to rewards when making decisions for themselves (Foster, Shenesey & Goff, 2009) may then lead to greater risk taking when making decisions for others. Therefore, one explanation for this finding then is that those higher in narcissism are less concerned by potential consequences for others due to their distance from the consequences and therefore weight the potential benefit from the risk more highly than do those lower in narcissism.

The hypothesis that those higher in narcissism who bonded with their partner would make less risky decisions for their partner in the other-reward and self- and other-reward asymmetry conditions than those higher in narcissism who did not bond with their partner (H5) was not supported; none of the interactions between narcissism and condition on any of the dependent variables were significant. However, there was a non-hypothesized finding that suggested bonding reduce the risky decisions made by those higher in narcissism in the self- and other-reward asymmetry condition only for those who were also high in subjective numeracy. Potentially this is because those higher in subjective numeracy were better able to understand the probabilities and risks associated with their decisions and were thus able to understand the risk conferred to their partner by putting more hard cards on the board. Accordingly, those higher in narcissism may make less risky decisions for those they are close with but only when they have the skills to understand the risk in a given scenario. Nevertheless, this interaction was only

marginally significant and this finding would need to be replicated to ensure this was not simply an artifact of the data.

The hypothesis that those higher in psychopathy would make riskier decisions for others in the other-reward and self- and other-reward asymmetry conditions regardless of whether they bonded with the other person (H6) only received partial support. In support of this hypothesis, those higher in psychopathy made riskier decisions for their partner when they benefited from the risk and their partner would suffer any negative consequences associated with the risk (i.e., self- and other-reward asymmetry). Further, there were several non-hypothesized findings that suggested that those high in psychopathy and objective numeracy made riskier decisions when they benefited from increased risk conferred to their partner than they did when they were responsible for all benefits and consequences (i.e., self-reward only). These results are consistent with previous findings that those high in psychopathy are willing to make risky decisions for others when it will benefit themselves (Jones, 2013) and are even willing to physically harm close others for a reward (Jones et al., 2016). It therefore appears then that those high in psychopathy are generally less concerned with consequences experienced by others in their pursuit of a reward.

However, contrary to the sixth hypothesis, those high in psychopathy did not make riskier choices for others when they do not stand to gain from the increased risk. Specifically, those higher in psychopathy did not make riskier choices for others even when they did not benefit from this risk, contrary to my hypothesis. This result seems to suggest that only the potential for self-reward engages the processes described by the response modulation hypothesis (i.e., myopic focus on potential reward to exclusion of peripheral punishment cues) (e.g., Newman et al., 1990). In contrast, when those high in psychopathy are not able to benefit from their decisions

they do not make decisions that are any more or less risky than those made by individuals lower in psychopathy. In this way, those higher in psychopathy may only make riskier decisions in self-relevant scenarios (i.e., situations in which they have something to gain).

Consistent with the hypothesis, there were also no significant interactions between psychopathy and objective numeracy on any of the dependent variables. Yet, there were several non-hypothesized significant three-way interactions between psychopathy, condition, and objective numeracy. Expressly, those high in psychopathy who were also lower in objective numeracy and bonded with their partner made riskier decisions for their partner in the other-reward scenario (i.e., their partner would reap all benefits and suffer all consequences of the outcome). In fact, those high in psychopathy, but low in objective numeracy made riskier decisions in the other reward-scenario than they did self-reward scenario (i.e., they were responsible for all consequences and benefits). Thus, it appears that those higher in psychopathy who do not necessarily have the skills to understand the risk associated with their decision, make riskier choices for individuals with whom they feel closer.

One explanation for this finding is that those higher in psychopathy who have bonded with their partner view subsequent decisions for their partner as self-relevant and therefore engage in a decision process more similar to the one they use when making decisions for themselves. Explicitly, when making decisions for themselves, those high in psychopathy have a tendency to focus on the goal of the task to the exclusion of punishment cues (e.g., Newman et al., 1990). This results in those high in psychopathy making riskier decisions for themselves than those lower this trait (e.g., Newman et al., 19987). However, in this study those higher in psychopathy who did not bond with their partner, did not make riskier decisions for their partner when they had nothing to gain. This suggests that the myopic focus on reward characteristic of

psychopathic decision making may only be engaged for decisions in which those high in psychopathy perceive there to be a self-relevant goal (e.g., obtaining more raffle entries for themselves). That those high in psychopathy also make riskier decisions for others when they have bonded with them would then suggest that bonding makes the potential reward for another person self-relevant. Further, these decisions for close others made by those high in psychopathy are likely to be even more risky – as was found in this study – than those they make for themselves due to the general tendency for individuals to react less negatively to consequences affecting others (e.g., Beisswanger et al., 2003). As those high in psychopathy are already less likely to consider the consequences of their decisions in pursuit of a goal, this tendency is likely to be exaggerated given the separation of making decisions for others. Nevertheless, these explanations must be replicated in order to determine that these findings are not an artifact of the data. Accordingly, it is well to emphasize caution in considering these explanations, as these are post-hoc explanations of non-hypothesized findings.

There was also a surprising finding that the order of conditions affected the relationship between psychopathy and the outcomes of interest. In analyzing only participants who completed the self- and other-reward asymmetry condition before the other-reward condition, those high in psychopathy made riskier decisions for themselves (i.e., self-reward) than their partner (i.e., other reward). However, those high in psychopathy who bonded with their partner made riskier decisions for their partner in the other-reward only condition (i.e., their partner would suffer any consequences and benefit from any gains). Indeed, those higher in psychopathy who bonded with their partner made riskier decisions for their partner in the other-reward condition than in the self-reward condition than did those who were high in psychopathy

and did not bond with their partner. Unlike in the analyses conducted using all participants, this finding was not mediated by objective numeracy.

The hypothesis that those higher in Machiavellianism would make riskier decisions for others in the other-reward and self- and other-reward asymmetry conditions regardless of whether they bonded with the other person (H7) was not supported; Machiavellianism was not associated with making riskier choices for their partner. This may be due to their suspicious nature (Christie & Geis, 1970) such that they did not trust they would not be interacting with their partner again. Previous studies have shown that those high in Machiavellianism make less selfish choices for others when they may be punished for their choices (e.g., Bereczkei & Czibor, 2014). Therefore, if those high in Machiavellianism thought there was a possibility they would suffer consequences because of their behavior they would likely make less selfish decisions. Alternatively, the raffle may not have been enough of a reward to risk harming a potentially fruitful relationship with another student at their university. Although these participants did not personally know each other, they were aware that they all attended the same university and were enrolled in a psychology class. As those higher in Machiavellianism are able to consider the long-term consequences of their behavior (Jones & Paulhus, 2011a), they may have considered the possibility or risking a fruitful future relationship not worth the chance to win $50.

4.3 Empathy

As previous studies have found that empathy is related to decisions made for others (e.g., O'Connell et al., 2013), also considered the effect of empathy on decisions made in this study. Those higher in empathy made less risky decisions for others when they would benefit from this risk. Additionally, for participants who completed the other-reward condition first there was an effect of condition such that those who bonded with their partner made less risky decisions but

this was true only for those lower in empathy. Therefore, it seems that feeling close to the other person may only affect the decisions made for those lower in empathy as those higher in empathy already make less risky decisions for others, regardless of how close they are to the person. The fact that this effect was not found when participants completed the self and other reward asymmetry condition first might be due to the tendency for those with higher levels of empathy to anchor to the decisions they made for themselves (Faro & Rottenstreich, 2006). Specifically, participants who completed the self and other reward asymmetry condition first made a decision involving themselves – even if the decision had consequences for others – and this might have activated the tendency for individuals high in empathy to anchor their decisions for others to the decisions they made for themselves.

4.4 Limitations and Future Directions

One limitation of the present research is the lack of a distant other neutral condition. Specifically, that there was no effect found for bonding in this study may have been due to participants in the neutral condition meeting their partners (who were similar to themselves) in-vivo. Future research is needed to determine whether the lack of bonding effect was due to the in-vivo interaction and if so, the specific aspect of this interaction that result in making less risky decisions for a close other. Additionally, future researchers should examine the effect of partner's personality on the decisions participants make for their partner. For example, previous studies have shown that those higher in narcissism are liked more than those lower in narcissism at initial meeting (Paulhus, 1998). It is possible then that this might affect the amount of risk deemed acceptable for one's partner. Finally, given some of these results were not hypothesized (e.g,. the effect of bonding on psychopathy) future research is needed to establish the replicability of these findings.

4.5 Conclusion

Together these findings extend the literatures on self and other decision making the Dark Triad traits in a few key ways. First, this study serves to advance the literature on self- and other-decision making insofar as establishing that individuals make riskier decisions for others when they benefit from this increased risk. Additionally, the several significant three-way interactions between Dark Triad traits, bonding, and numeracy indicate that one's comfort or ability to work with numbers might be a key individual difference when examining individual's consideration of risk for the self and others.

Further, the non-hypothesized findings that bonding was effective insofar as those higher in narcissism and subjective numeracy made less risky decisions for their partner when they stood to benefit from increased risk serves as further evidence that narcissists' self-focus can be shifted to include greater concern for others. Moreover, the unexpected interaction between psychopathy and bonding provides initial evidence that the decision making process described by the response modulation hypothesis is true only for decisions that are self-relevant. However, future studies are needed establish the replicability of these three-way interactions, as they were not hypothesized. Furthermore, as the pattern of findings for each of the dark triad traits diverged, these findings support the uniqueness of these constructs and contradict the unificationist perspective that the same trait underlies all three personalities.

Finally, this study generally serves to elucidate the problematic nature of the typical incentive structure for portfolio managers, which is based on self- and other-reward asymmetries (Brown, 1996). Expressly, these findings indicate that these incentive structures likely lead individuals to take greater risks for their clients. Those portfolio managers high in interpersonally manipulative traits are especially likely to make risky decisions for their clients in order to obtain a reward.

References

About. (n.d.). Retrieved November 21, 2016, from http://occupywallst.org/about/

Albrecht, K., Volz, K. G., Sutter, M., Laibson, D. I., & Von Cramon, D. Y. (2010). What is for me is not for you: Brain correlates of intertemporal choice for self and other. *Social Cognitive and Affective Neuroscience*, 1-8. doi: 10.1093/scan/nsq046

Ali, F., & Chamorro-Premuzic, T. (2010). Investigating theory of mind deficits in nonclinical psychopathy and Machiavellianism. *Personality and Individual Differences, 49*, 169-174.

Allen, F., & Gorton, G. (1993). Churning bubbles. *The Review of Economic Studies, 60*, 813-836.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5*. Washington, D.C: American Psychiatric Association.

Andersson, O., Holm, H. J., Tyran, J. R., & Wengström, E. (2014). Deciding for others reduces loss aversion. *Management Science, 62*(1), 29-36.

Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, 63, 596–612.

Bagozzi, R. P., Verbeke, W. J., Dietvorst, R. C., Belschak, F. D., van den Berg, W. E., & Rietdijk, W. J. (2013). Theory of mind and empathic explanations of Machiavellianism a neuroscience perspective. *Journal of Management, 39*, 1760-1798.

Barber, B. M., & Odean, T. (2000). Trading is hazardous to your wealth: The common stock investment performance of individual investors. *The Journal of Finance, 55*, 773-806.

Baron-Cohen, S., & Wheelwright, S. (2004). The empathy quotient: an investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders, 34*, 163-175.

Becker, J. A., & Dan O'Hair, H. (2007). Machiavellians' motives in organizational citizenship behavior. *Journal of Applied Communication Research, 35*, 246-267.

Beisswanger, A. H., Stone, E. R., Hupp, J. M., & Allgaier, L. (2003). Risk taking in relationships: Differences in deciding for oneself versus for a friend. *Basic and Applied Social Psychology, 25*, 121-135.

Benavidez, T. M., Neria, A. L., & Jones, D. N. (2016). The bond that breaks: Intimacy and honor predict morally related aggression. *Evolutionary Psychological Science, 2*, 140-148. doi: 10.1007/s40806-016-0044-x

Bereczkei, T. (2015). The manipulative skill: Cognitive devices and their neural correlates underlying Machiavellian's decision making. *Brain and Cognition, 99*, 24-31.

Bereczkei, T., Birkas, B., & Kerekes, Z. (2007). Public charity offer as a proximate factor of evolved reputation-building strategy: An experimental analysis of a real-life situation. *Evolution and Human Behavior, 28*, 277-284.

Bereczkei, T., Birkas, B., & Kerekes, Z. (2010). The presence of others, prosocial traits, Machiavellianism: A personality x situation approach. *Social Psychology, 4*, 238-245.

Bereczkei, T., & Czibor, A. (2014). Personality and situational factors differently influence high Mach and low Mach persons' decisions in a social dilemma game. *Personality and Individual Differences, 64*, 168-173.

Bereczkei, T., Deak, A., Papp, P., Perlaki, G., & Orsi, G. (2013). Neural correlates of Machiavellian strategies in a social dilemma task. *Brain and Cognition, 82*, 108-116.

Bradlee, P. M., & Emmons, R. A. (1992). Locating narcissism within the interpersonal circumplex and the five-factor model. *Personality and Individual Differences, 13*, 821-830.

Brown, S. L. (1996). Churning: Excessive trading in retail securities accounts. *Financial Services Review, 5*, 43-56.

Brunell, A. B., & Buelow, M. T. (2015). Narcissism and performance on behavioral decision-making tasks. *Journal of Behavioral Decision Making, 28*, 76-88. doi: 10.1002/bdm.1900.

Bushman, B. J., & Baumeister, R. F. (1998). Threatened egotism, narcissism, self-esteem, and direct and displaced aggression: Does self-love or self-hate lead to violence? *Journal of Personality and Social Psychology, 75*, 219-229.

Campbell, W. K. (1999). Narcissism and romantic attraction. *Journal of Personality and Social Psychology, 77,* 1254-1270.

Campbell, W. K., Bush, C. P., Brunell, A. B., & Shelton, J. (2005). Understanding the social costs of narcissism: The case of the tragedy of the commons. *Personality and Social Psychology Bulletin, 31*, 1358-1368.

Campbell, W. K., Goodie, A. S., & Foster, J. D. (2004). Narcissism, confidence, and risk attitude. *Journal of Behavioral Decision Making, 17*, 297-311.

Campbell, W. K., Foster, C. A., & Finkel, E. J. (2002). Does self-love lead to love for others? A story of narcissistic game playing. *Journal of Personality and Social Psychology, 83*, 340-354.

Campbell, W. K., Rudich, E. A., & Sedikides, C. (2002). Narcissism, self-esteem, and the positivity of self-views: Two portraits of self-love. *Personality and Social Psychology Bulletin, 28*, 358-368.

Carroll, L. (1987). A study of narcissism, affiliation, intimacy, and power motives among students in business administration. *Psychological Reports, 61*, 355-358.

Chakravarty, S., Harrison, G. W., & Rustrom, E. (2005). *Are You Risk Averse Over Other People's Money?* (No. WP2005-08-04). Indian Institute of Management Ahmedabad, Research and Publication Department.

Christie, R., & Geis, F. L. (1970). *Machiavellianism.* Academic Press, Incorporated.

Cleckley, H. (1982). The mask of sanity (6th ed.). St.Louis, MO: Mosby. (Original work published 1941)

Czibor, A., & Bereczkei, T. (2012). Machiavellian people's success results from monitoring their partners. *Personality and Individual Differences, 53*, 202-206.

Czibor, A., Vincze, O., & Bereczkei, T. (2014). Feelings and motives underlying Machiavellian behavioural strategies; narrative reports in a social dilemma situation. *International Journal of Psychology, 49*, 519-524.

Dave, C., Eckel, C. C., Johnson, C. A., & Rojas, C. (2010). Eliciting risk preferences: When is simple better? *Journal of Risk and Uncertainty, 41*, 219-243.

Deluga, R. J. (2001). American presidential Machiavellianism: Implications for charismatic leadership and rated performance. *The Leadership Quarterly, 12*, 339-363.

Esperger, Z., & Bereczkei, T. (2012). Machiavellianism and spontaneous mentalization: One step ahead of others. *European Journal of Personality, 26*, 580-587.

Fagerlin, A., Zikmund-Fisher, B. J., Ubel, P. A., Jankovic, A., Derry, H. A., & Smith, D. M. (2007). Measuring numeracy without a math test: Development of the Subjective Numeracy Scale. *Medical Decision Making, 27*, 672-680.

Faro, D., & Rottenstreich, Y. (2006). Affect, empathy, and regressive mispredictions of others' preferences under risk. *Management Science, 52*, 529-541.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*, 1149-1160.

Fehr, B., Samson, D., & Paulhus, D. L. (1992). The construct of Machiavellianism: Twenty years later. In C.D. Speilberger & J. N. Butcher (Eds.), *Advances in Personality Assessment* (Vol. 9, pp. 11-1116). Hillsdale, NJ: Erlbaum.

Foster, J. D., Misra, T. A., & Reidy, D. E. (2009). Narcissists are approach-oriented toward their money and their friends. *Journal of Research in Personality, 43*, 764-769.

Foster, J. D., Shenesey, J. W., & Goff, J. S. (2009). Why do narcissists take more risks? Testing the roles of perceived risks and benefits of risky behaviors. *Personality and Individual Differences, 47*, 885-889.

Foster, J. D., & Trimm, R. F. (2008). On being eager and uninhibited: Narcissism and approach–avoidance motivation. *Personality and Social Psychology Bulletin, 34*, 1004-1017.

Freud, S. (1914). On narcissism. Standard Edition. *Original work published*.

Fulton, J. J., Marcus, D. K., & Payne, K. T. (2010). Psychopathic personality traits and risky sexual behavior in college students. *Personality and Individual Differences, 49*, 29-33.

Gable, M., Hollon, C., & Dangello, F. (1992). Managerial structuring of work as a moderator of the Machiavellianism and job performance relationship. *The Journal of Psychology, 126,* 317-325.

Gabriel, M. T., Critelli, J. W., & Ee, J. S. (1994). Narcissistic illusions in self- evaluations of intelligence and attractiveness. *Journal of Personality, 62*, 143-155.

Garcia-Retamero, R., & Galesic, M. (2012). Doc, what would you do if you were me? On self–other discrepancies in medical decision making. *Journal of Experimental Psychology: Applied, 18*, 38-51.

Gentile, B., Miller, J.D., Hoffman, B.J., Reidy, D.E., Zeichner, A., & Campbell, W.K. (2013). A test of two brief measures of grandiose narcissism: The narcissistic personality inventory-13 and the Narcissistic Personality Inventory-16. *Psychological Assessment, 25*, 1120–1136.

Giacomin, M., & Jordan, C. H. (2014). Down-regulating narcissistic tendencies communal focus reduces state narcissism. *Personality and Social Psychology Bulletin, 40*, 488-500.

Greenstein, M. J., & Xu, X. (2015). My mug is valuable, but my partner's is even more so: Economic decisions for close others. *Basic and Applied Social Psychology, 37*, 174-187.

Grijalva, E., & Zhang, L. (2016). Narcissism and self-insight: A review and meta-analysis of narcissists' self-enhancement tendencies. *Personality and Social Psychology Bulletin, 42*, 3-24.

Gunnthorsdottir, A., McCabe, K., & Smith, V. (2002). Using the Machiavellianism instrument to predict trustworthiness in a bargaining game. *Journal of Economic Psychology, 23*, 49-66.

Gustafson, S. B., & Ritzer, D. R. (1995). The dark side of normal: a psychopathy- linked pattern called aberrant self- promotion. *European Journal of Personality, 9,* 147-183.

Hare, R. D. (1978). Psychopathy and electrodermal responses to nonsignal stimulation. *Biological Psychology, 6*, 237-246.

Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality and Individual Differences, 1*, 111-119.

Hare, R. D. (2003). Hare PCL-R: Technical Manual. *The Hare PCL-R: Technical manual*, 1-222.

Hare, R. D., & Neumann, C. S. (2005). Structural models of psychopathy. *Current psychiatry reports, 7*, 57-64.

Hare, R. D., & Vertommen, H. (1991). *The Hare psychopathy checklist-revised*. Multi-Health Systems, Incorporated.

Harrell, W. A. (1980). Retaliatory aggression by high and low Machiavellians against remorseful and non-remorseful wrongdoers. *Social Behavior and Personality, 8*, 217-220.

Harrell, W. A., & Hartnagel, T. (1976). The impact of Machiavellianism and the trustfulness of the victim on laboratory theft. *Sociometry, 39*, 157-165.

Hepper, E. G., Hart, C. M., & Sedikides, C. (2014). Moving narcissus can narcissists be empathic? *Personality and Social Psychology Bulletin, 40*, 1079-1091. doi: 10.1177/0146167214535812

Hetherington, E. M., & Klinger, E. (1964). Psychopathy and punishment. *The Journal of Abnormal and Social Psychology, 69*, 113-115.

Hoppenbrouwers, S. S., Bulten, B. H., & Brazil, I. A. (2016). Parsing fear: A reassessment of the evidence for fear deficits in psychopathy. *Psychological Bulletin, 142*, 573-600. doi: 10.1037/bul0000040

Hsee, C. K., & Weber, E. U. (1997). A fundamental prediction error: Self–others discrepancies in risk preference. *Journal of Experimental Psychology: General, 126*, 45-53.

Jakobwitz, S., & Egan, V. (2006). The dark triad and normal personality traits. *Personality and Individual Differences, 40*, 331-339.

Jonason, P. K., Koenig, B. L., & Tost, J. (2010). Living a fast life. *Human Nature, 21*, 428-442.

Jonason, P. K., Li, N. P., Webster, G. D., & Schmitt, D. P. (2009). The dark triad: Facilitating a short- term mating strategy in men. *European Journal of Personality, 23*, 5-18.

Jones, D. N. (2013). What's mine is mine and what's yours is mine: The Dark Triad and gambling with your neighbor's money. *Journal of Research in Personality, 47*, 563-571.

Jones, D. N. (2014). Risk in the face of retribution: Psychopathic individuals persist in financial misbehavior among the Dark Triad. *Personality and Individual Differences, 67*, 109-113.

Jones, D. N. (2016). The nature of Machiavellianism: Distinct patterns of misbehavior. In V. Zeigler-Hill & D. K. Marcus (Eds.), *The dark side of personality*. Washington, D. C.: American Psychological Association.

Jones, D. N., Carre, J. R., Tirres, K., Rangel., A., & Sanchez, A. (2016). Psychopathy and selfish harm towards loved ones. Manuscript submitted for publication.

Jones, D. N., & Figueredo, A. J. (2013). The core of darkness: Uncovering the heart of the Dark Triad. *European Journal of Personality, 27*, 521-531.

Jones, D. N., & Olderbak, S. G. (2014). The associations among dark personalities and sexual tactics across different scenarios. *Journal of Interpersonal Violence, 29*, 1050-1070.

Jones, D. N., & Paulhus, D. L. (2010). Different provocations trigger aggression in narcissists and psychopaths. *Social Psychological and Personality Science, 1*, 12-18.

Jones, D. N., & Paulhus, D. L. (2011a). Differentiating the Dark Triad within the interpersonal circumplex. In L. M. Horowitz & S. Strack (Eds.), *Handbook of interpersonal psychology: Theory, research, assessment, and therapeutic interventions*, (pp. 249-269). New York, NY: Wiley & Sons.

Jones, D. N., & Paulhus, D. L. (2011b). The role of impulsivity in the Dark Triad of personality. *Personality and Individual Differences, 51*, 679-682.

Jones, D. N., & Weiser, D. A. (2014). Differential infidelity patterns among the Dark Triad. *Personality and Individual Differences, 57*, 20-24.

Konrath, S., Bushman, B. J., & Grove, T. (2009). Seeing my world in a million little pieces: Narcissism, self- construal, and cognitive–perceptual style. *Journal of Personality, 77*, 1197-1228.

Kray, L. J. (2000). Contingent weighting in self-other decision making. *Organizational Behavior and Human Decision Processes, 83,* 82-106.

Kray, L., & Gonzalez, R. (1999). Differential weighting in choice versus advice: I'll do this, you do that. *Journal of Behavioral Decision Making, 12*, 207-217.

Lakey, C. E., Rose, P., Campbell, W. K., & Goodie, A. S. (2008). Probing the link between narcissism and gambling: The mediating role of judgment and decision- making biases. *Journal of Behavioral Decision Making, 21*, 113-137.

Leary, M. R., Knight, P. D., & Barnes, B. D. (1986). Ethical ideologies of the Machiavellian. *Personality and Social Psychology Bulletin, 12*, 75-80.

LeBreton, J. M., Binning, J. F., & Adorno, A. J. (2006). Subclinical psychopaths. *Comprehensive Handbook of Personality and Psychopathology, 1*, 388-411.

Lee, K., & Ashton, M. C. (2004). Psychometric properties of the HEXACO personality inventory. *Multivariate Behavioral Research, 39*, 329-358.

Lee, K., & Ashton, M. C. (2005). Psychopathy, Machiavellianism, and narcissism in the Five-Factor Model and the HEXACO model of personality structure. *Personality and Individual Differences, 38*, 1571-1582.

Lee, K., & Ashton, M. C. (2014). The dark triad, the big five, and the HEXACO model. *Personality and Individual Differences, 67*, 2-5.

Levenson, M. R., Kiehl, K. A., & Fitzpatrick, C. M. (1995). Assessing psychopathic attributes in a noninstitutionalized population. *Journal of Personality and Social Psychology, 68*, 151-158.

Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal population. *Journal of Personality Assessment, 66*, 488-524.

Lipkus, I. M., Samsa, G., & Rimer, B. K. (2001). General performance on a numeracy scale among highly educated samples. *Medical Decision Making,21*, 37-44.

Liu, C. C. (2008). The relationship between Machiavellianism and knowledge sharing willingness. *Journal of Business and Psychology, 22*, 233-240.

Liviatan, I., Trope, Y., & Liberman, N. (2008). Interpersonal similarity as a social distance dimension: Implications for perception of others' actions. *Journal of Experimental Social Psychology, 44*, 1256-1269.

Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin, 127*, 267-286.

Lösel, F., & Schmucker, M. (2004). Psychopathy, risk taking, and attention: A differentiated test of the somatic marker hypothesis. *Journal of Abnormal Psychology, 113*, 522-529.

Lu, J., Xie, X., & Xu, J. (2012). Desirability or feasibility self–other decision-making differences. *Personality and Social Psychology Bulletin, 39*, 144-155.

Lynam, D. R., Hoyle, R. H., & Newman, J. P. (2006). The perils of partialling cautionary tales from aggression and psychopathy. *Assessment, 13*, 328-341.

Lyons, M., & Aitken, S. (2010). Machiavellian friends? The role of Machiavellianism in friendship formation and maintenance. *Journal of Social, Evolutionary, and Cultural Psychology, 4*, 194-202.

Lyons, M., Caldwell, T., & Shultz, S. (2010). Mind-reading and manipulation—Is Machiavellianism related to theory of mind? *Journal of Evolutionary Psychology, 8,* 261-274.

Machiavelli, N. (1513/1981). The Prince. New York: Bantam classics.

McHoskey, J. W. (1995). Narcissism and Machiavellianism. *Psychological Reports, 77*, 755-759.

McHoskey, J. W. (1999). Machiavellianism, intrinsic versus extrinsic goals, and social interest: A self-determination theory analysis. *Motivation and Emotion, 23*, 267-283.

McHoskey, J. W., Worzel, W., & Szyarto, C. (1998). Machiavellianism and psychopathy. *Journal of Personality and Social Psychology, 74*, 192-210.

McIllwain, D. (2003). Bypassing empathy: A Machiavellian theory of mind and sneaky power. In B. Repacholi & V. Slaughter (Eds.), *Individual differences in theory of mind. Macquarie monographs in cognitive science* (pp. 39–66). Hove, E. Sussex: Psychology Press.

Mealey, L. (1995). The sociobiology of sociopathy: An integrated evolutionary model. *Behavioral and Brain Sciences, 18*, 523-541.

Mengarelli, F., Moretti, L., Faralla, V., Vindras, P., & Sirigu, A. (2014). Economic decisions for others: An exception to loss aversion law. *PloS One, 9*, e85042.

Miller, J. D., & Campbell, W. K. (2008). Comparing clinical and social- personality conceptualizations of narcissism. *Journal of Personality, 76*, 449-476.

Mobbs, D., Yu, R., Meyer, M., Passamonti, L., Seymour, B., Calder, A. J., ... & Dalgleish, T. (2009). A key role for similarity in vicarious reward. *Science, 324*, 900-900.

Morf, C. C., & Rhodewalt, F. (2001). Unraveling the paradoxes of narcissism: A dynamic self-regulatory processing model. *Psychological Inquiry, 12*, 177-196.

Nathanson, C., Paulhus, D. L., & Williams, K. M. (2006). Predictors of a behavioral measure of scholastic cheating: Personality and competence but not demographics. *Contemporary Educational Psychology, 31*, 97-122.

Newman, J. P., & Baskin-Sommers, A. R. (2012). Early selective attention abnormalities in psychopathy. In M.I. Posner (Ed.), *Cognitive neuroscience of attention*, (pp. 421-440). New York, NY: Guilford.

Newman, J. P., Curtin, J. J., Bertsch, J. D., & Baskin-Sommers, A. R. (2010). Attention moderates the fearlessness of psychopathic offenders. *Biological Psychiatry, 67*, 66-70.

Newman, J. P., Patterson, C. M., Howland, E. W., & Nichols, S. L. (1990). Passive avoidance in psychopaths: The effects of reward. *Personality and Individual Differences, 11*, 1101-1114.

Newman, J. P., Patterson, C. M., & Kosson, D. S. (1987). Response perseveration in psychopaths. *Journal of Abnormal Psychology, 96*, 145-148.

O'Boyle, E. H., Forsyth, D., Banks, G. C., & Story, P. A. (2013). A meta-analytic review of the Dark Triad–intelligence connection. *Journal of Research in Personality, 47*, 789-794.

O'Boyle, E. H., Forsyth, D. R., Banks, G. C., Story, P. A., & White, C. D. (2015). A meta-analytic test of redundancy and relative importance of the Dark Triad and Five- Factor Model of Personality. *Journal of Personality, 83*, 644-664.

O'Connell, G., Christakou, A., Haffey, A. T., & Chakrabarti, B. (2013). The role of empathy in choosing rewards from another's perspective. *Frontiers in human neuroscience, 7*(174), 1-5.

Paal, T., & Bereczkei, T. (2007). Adult theory of mind, cooperation, Machiavellianism: The effect of mindreading on social relations. *Personality and Individual Differences, 43*, 541-551.

Pabian, S., De Backer, C. J., & Vandebosch, H. (2015). Dark Triad personality traits and adolescent cyber-aggression. *Personality and Individual Differences, 75*, 41-46.

Patrick, C. J. (2005). Back to the future: Cleckley as a guide to the next generation of psychopathy research. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 605-618). New York, NY: Guilford.

Patrick, C. J., Bradley, M. M., & Lang, P. J. (1993). Emotion in the criminal psychopath: startle reflex modulation. *Journal of Abnormal Psychology, 102*, 82-92.

Paulhus, D. L. (1998). Interpersonal and intrapsychic adaptiveness of trait self-enhancement: A mixed blessing? *Journal of Personality and Social Psychology, 74*, 1197-1208.

Paulhus, D. L., Harms, P. D., Bruce, M. N., & Lysy, D. C. (2003). The over-claiming technique: measuring self-enhancement independent of ability. *Journal of Personality and Social Psychology, 84*, 890-904.

Paulhus, D.L., Neumann, C.S., & Hare, R.D. (in press). Self Report Psychopathy (SRP) scale. Toronto: Multi-Health Systems.

Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism, and psychopathy. Journal of Research in Personality, 36, 556-563.

Pollai, M., & Kirchler, E. (2012). Differences in risk-defusing behavior in deciding for oneself versus deciding for other people. *Acta Psychologica, 139*, 239-243.

Polman, E. (2010). Information distortion in self-other decision making. *Journal of Experimental Social Psychology, 46*, 432-435.

Polman, E. (2012). Self–other decision making and loss aversion. *Organizational Behavior and Human Decision Processes, 119*, 141-150.

Raskin, R. N., & Hall, C. S. (1979). A narcissistic personality inventory. *Psychological Reports, 45*, 590-590.

Raskin, R., & Shaw, R. (1988). Narcissism and the use of personal pronouns. *Journal of Personality, 56*, 393-404.

Rauthmann, J. F. (2012). The Dark Triad and interpersonal perception: Similarities and differences in the social consequences of narcissism, Machiavellianism, and psychopathy. *Social Psychological and Personality Science, 3*, 487-496.

Rauthmann, J. F., & Kolar, G. P. (2012). How "dark" are the Dark Triad traits? Examining the perceived darkness of narcissism, Machiavellianism, and psychopathy. *Personality and Individual Differences, 53,* 884-889.

Rhodewalt, F., & Eddings, S. K. (2002). Narcissus reflects: Memory distortion in response to ego-relevant feedback among high-and low-narcissistic men. *Journal of Research in Personality, 36*, 97-116.

Ricks, J., & Fraedrich, J. (1999). The paradox of Machiavellianism: Machiavellianism may make for productive sales but poor management reviews. *Journal of Business Ethics, 20*, 197-205.

Sakalaki, M., Richardson, C., & Thépaut, Y. (2007). Machiavellianism and economic opportunism. *Journal of Applied Social Psychology, 37*, 1181-1190.

Salekin, R. T., Trobst, K. K., & Krioukova, M. (2001). Construct validity of psychopathy in a community sample: A nomological net approach. *Journal of Personality Disorders, 15*, 425-441.

Schmauk, F. J. (1970). Punishment, arousal, and avoidance learning in sociopaths. *Journal of Abnormal Psychology, 76*, 325-335.

Shakespeare, W. (n.d.) *Winter's tale*. Retrieved from http://shakespeare.mit.edu/winters_tale/full.html

Shultz, C. J. (1993). Situational and dispositional predictors of performance: A test of the hypothesized Machiavellianism structure interaction among sales persons. *Journal of Applied Social Psychology, 23*, 478-498.

Smith, S. F., & Lilienfeld, S. O. (2015). The response modulation hypothesis of psychopathy: A meta-analytic and narrative analysis. *Psychological Bulletin, 141*, 1145-1177.

Smith, S. S., & Newman, J. P. (1990). Alcohol and drug abuse-dependence disorders in psychopathic and nonpsychopathic criminal offenders. *Journal of Abnormal Psychology, 99,* 430-439.

Spitzer, M., Fischbacher, U., Herrnberger, B., Grön, G., & Fehr, E. (2007). The neural signature of social norm compliance. *Neuron, 56*, 185-196.

Stone, E. R., & Allgaier, L. (2008). A social values analysis of self–other differences in decision making involving risk. *Basic and Applied Social Psychology, 30*, 114-129.

Stone, E. R., Choi, Y., de Bruin, W. B., & Mandel, D. R. (2013). I can take the risk, but you should be safe: Self-other differences in situations involving physical safety. *Judgment and Decision Making, 8*, 250-267.

Stylianou, A. C., Winter, S., Niu, Y., Giacalone, R. A., & Campbell, M. (2013). Understanding the behavioral intention to report unethical information technology practices: The role of Machiavellianism, gender, and computer expertise. *Journal of Business Ethics, 117*, 333-343.

Sullivan, E. A., & Kosson, D. S. (2005). Ethnic and cultural variations in psychopathy. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 605-618). New York, NY: Guilford.

Trump, R. K., Finkelstein, S. R., & Connell, P. M. (2015). I will risk a stranger's money, but not my own or my friend's money: Effect of proximity of the money source to the self on financial risk-taking. *Marketing Letters, 26*, 501-512.

Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: A reference-dependent model. *The Quarterly Journal of Economics, 106*, 1039-1061.

Twenge, J. M., & Campbell, W. K. (2003). "Isn't it fun to get the respect that we're going to deserve?" Narcissism, social rejection, and aggression. *Personality and Social Psychology Bulletin, 29*, 261-272.

Vernon, P. A., Villani, V. C., Vickers, L. C., & Harris, J. A. (2008). A behavioral genetic investigation of the Dark Triad and the Big 5. *Personality and Individual Differences, 44*, 445-452.

Verona & Vitale, J. (2005). Psychopathy in women: Assessment, manifestations, and etiology. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 605-618). New York, NY: Guilford.

Wai, M., & Tiliopoulos, N. (2012). The affective and cognitive empathic nature of the dark triad of personality. *Personality and Individual Differences, 52*, 794-799.

Wallace, H. M., & Baumeister, R. F. (2002). The performance of narcissists rises and falls with perceived opportunity for glory. *Journal of Personality and Social Psychology, 82*, 819-834.

Walsh, Z., Swogger, M. T., & Kosson, D. S. (2009). Psychopathy and instrumental violence: Facet level relationships. *Journal of Personality Disorders, 23*, 416-424.

Wiggins, J. S. (1979). A psychological taxonomy of trait-descriptive terms: The interpersonal domain. *Journal of Personality and Social Psychology, 37*, 395-412.

Williams, K. M., Cooper, B. S., Howell, T. M., Yuille, J. C., & Paulhus, D. L. (2009). Inferring sexually deviant behavior from corresponding fantasies the role of personality and pornography consumption. *Criminal Justice and Behavior, 36,* 198-222.

Williams, K. M., Nathanson, C., & Paulhus, D. L. (2010). Identifying and profiling scholastic cheaters: Their personality, cognitive ability, and motivation. *Journal of Experimental Psychology: Applied, 16*, 293-307.

Williams, K. M., Paulhus, D. L., & Hare, R. D. (2007). Capturing the four-factor structure of psychopathy in college students via self-report. *Journal of Personality Assessment, 88*, 205-219.

Wilson, D. S., Near, D., & Miller, R. R. (1996). Machiavellianism: a synthesis of the evolutionary and psychological literatures. *Psychological Bulletin, 119*, 285-299.

Wolfson, S. L. (1981). Effects of Machiavellianism and communication on helping behavior during an emergency. *British Journal of Social Psychology, 20*, 189-195.

Wray, L. D., & Stone, E. R. (2005). The role of self- esteem and anxiety in decision making for self versus others in relationships. *Journal of Behavioral Decision Making, 18*, 125-144.

Appendix A

Narcissistic Personality Inventory – 13

Instructions: Read each pair of statements and then choose the one that is closer to your own feelings. Indicate your answer by circling the letter "A" or "B" to the left of the item. Please do not skip any items.

A When people compliment me I sometimes get embarrassed.

B I know that I am good because everybody keeps telling me so.

A I like having authority over people.

B I don't mind following orders.

A I find it easy to manipulate people.

B I don't like it when I find myself manipulating people.

A I insist upon getting the respect that is due me.

B I usually get the respect that I deserve.

A I don't particularly like to show off my body.

B I like to display my body.

A My body is nothing special.

B I like to look at my body.

A I try not to be a show off.

B I am apt to show off if I get the chance.

A I expect a great deal from other people.

B I like to do things for other people.

A I will never be satisfied until I get all that I deserve.

B I take my satisfactions as they come.

A I have a strong will to power.

B Power for its own sake doesn't interest me.

A I like to look at myself in the mirror.

B I am not particularly interested in looking at myself in the mirror.

A Being an authority doesn't mean that much to me.

B People always seem to recognize my authority.

A I am a born leader.

B Leadership is a quality that takes a long time to develop.

Appendix B

Mach-IV

Instructions: Please indicate how much you agree with the following questions using the scale below:

1	*2*	*3*	*4*	*5*
Strongly Disagree	*Disagree*	*Neither Agree nor Disagree*	*Agree*	*Strongly Agree*

1. ____ The best way to handle people is to tell them what they want to hear.
2. ____ When you ask someone to do something for you, it is best to give the real reasons for wanting it rather than rather than giving reasons which might carry more weight. *
3. ____ Anyone who completely trusts anyone is asking for trouble.
4. ____ It is hard to get ahead without cutting corners here and there.
5. ____ Honesty is the best policy in all cases. *
6. ____ It is safest to assume that all people have a vicious streak and it will come out when they are given a chance.
7. ____ Never tell anyone the real reason you did something unless it is useful to do so.
8. ____ One should take action only when sure it is morally right. *
9. ____ It is wise to flatter important people.
10. ____ All in all, it is better to be humble and honest than to be important and dishonest.*
11. ____ Barnum was very wrong when he said there's a sucker born every minute. *

12. ____ People suffering from incurable diseases should have the choice of being put painlessly to death.
13. ____ It is possible to be good in all respects. *
14. ____ Most people are basically good and kind. *
15. ____ There is no excuse for lying to someone else. *
16. ____ Most people forget more easily the death of a parent than the loss of their property.
17. ____ Most people who get ahead in the world lead clean moral lives. *
18. ____ Generally speaking, people won't work unless they're forced to do so.
19. ____ The biggest difference between most criminals and other people is that criminals are stupid enough to get caught.
20. ____ Most people are brave. *

Appendix C

Empathy Quotient

Instructions: Please indicate how much you agree with the following questions using the scale below:

1	*2*	*3*	*4*
Strongly Agree	*Slightly Agree*	*Slightly Disagree*	*Strongly Disagree*

1. ____ I can easily tell if someone else wants to enter a conversation.*
2. ____ I prefer animals to humans.
3. ____ I try to keep up with the current trends and fashions.
4. ____ I find it difficult to explain to others things that I understand easily, when they don't understand it the first time.*
5. ____ I dream most nights.
6. ____ I really enjoy caring for other people.*
7. ____ I try to solve my own problems rather than discussing them with others.
8. ____ I find it hard to know what to do in social situations.*
9. ____ I am at my best first thing in the morning.
10. ____ People often tell me that I went too far in driving my point home in a discussion.*
11. ____ It doesn't bother me too much if I am late meeting a friend.*
12. ____ Friendships and relationships are just too difficult, so I tend not to bother with them.*
13. ____ I would never break a law, no matter how minor.
14. ____ I often find it difficult to judge if something is rude or polite.*

15. ____ In a conversation, I tend to focus on my own thoughts rather than on what my listener might be thinking.*
16. ____ I prefer practical jokes to verbal humor.
17. ____ I live life for today rather than the future.
18. ____ When I was a child, I enjoyed cutting up worms to see what would happen.*
19. ____ I can pick up quickly if someone says one thing but means another.*
20. ____ I tend to have very strong opinions about morality.
21. ____ It is hard for me to see why some things upset people so much.*
22. ____ I find it easy to put myself in somebody else's shoes.*
23. ____ I think that good manners are the most important thing a parent can teach their child.
24. ____ I like to do things on the spur of the moment.
25. ____ I am good at predicting how someone will feel.*
26. ____ I am quick to spot when someone in a group is feeling awkward or uncomfortable.*
27. ____ If I say something that someone else is offended by, I think that's their problem, not mine.*
28. ____ If anyone asked me if I liked their haircut, I would reply truthfully, even if I didn't like it.*
29. ____ I can't always see why someone should have felt offended by a remark.*
30. ____ People often tell me that I am very unpredictable.
31. ____ I enjoy being the center of attention at any social gathering.
32. ____ Seeing people cry doesn't really upset me.*
33. ____ I enjoy having discussions about politics.

34. ____ I am very blunt, which some people take to be rudeness, even though this is unintentional.*
35. ____ I don't tend to find social situations confusing.*
36. ____ Other people tell me I am good at understanding how they are feeling and what they are thinking.*
37. ____ When I talk to people, I tend to talk about their experiences rather than my own.*
38. ____ It upsets me to see an animal in pain.*
39. ____ I am able to make decisions without being influenced by people's feelings.*
40. ____ I can't relax until I have done everything I planned to do that day.
41. ____ I can easily tell if someone else is interested or bored with what I am saying.*
42. ____ I get upset if I see people suffering on news programmes.*
43. ____ Friends usually talk to me about their problems as they say that I am very understanding.*
44. ____ I can sense if I am intruding, even if the other person doesn't tell me.*
45. ____ I often start new hobbies but quickly become bored with them and move on to something else.
46. ____ People sometimes tell me that I have gone too far with teasing.*
47. ____ I would be too nervous to go on a big rollercoaster.
48. ____ Other people, often say that I am insensitive, though I don't always see why.*
49. ____ If I see a stranger in a group, I think that it is up to them to make an effort to join in.*
50. ____ I usually stay emotionally detached when watching a film.*

51. ____ I like to be very organized in day-to-day life and often make lists of the chores I have to do.
52. ____ I can tune into how someone else feels rapidly and intuitively.*
53. ____ I don't like to take risks.
54. ____ I can easily work out what another person might want to talk about.*
55. ____ I can tell if someone is masking their true emotion.*
56. ____ Before making a decision I always weigh up the pros and cons.
57. ____ I don't consciously work out the rules of social situations.*
58. ____ I am good at predicting what someone will do.*
59. ____ I tend to get emotionally involved with a friend's problems.*
60. ____ I can usually appreciate the other person's viewpoint, even if I don't agree with it.*

Appendix D

Subjective Numeracy Scale

1. How good are you at working with fractions?

1	*2*	*3*	*4*	*5*	*6*
Not at all good					*Extremely good*

2. How good are you at working with percentages?

1	*2*	*3*	*4*	*5*	*6*
Not at all good					*Extremely good*

3. How good are you at calculating a 15% tip?

1	*2*	*3*	*4*	*5*	*6*
Not at all good					*Extremely good*

4. How good are you at figuring out how much a shirt will cost if it is 25% off?

1	*2*	*3*	*4*	*5*	*6*
Not at all good					*Extremely good*

5. When reading the newspaper, how helpful do you find tables and graphs that are part of a story?

1	*2*	*3*	*4*	*5*	*6*

Not at all *Extremely*

6. When people tell you the chance of something happening, do you prefer that they use *words* (“it rarely happens”) or *numbers* (“there’s a 1% chance”)?

1 *2* *3* *4* *5* *6*

Always prefer words *Always prefer numbers*

7. When you hear a weather forecast, do you prefer predictions using *percentages* (e.g., “there will be a 20% chance of rain today”) or predictions using only *words* (e.g., “there is a small chance of rain today”)?

1 *2* *3* *4* *5* *6*

Always prefer percentages *Always prefer numbers*

8. How often do you find numerical information to be useful?

1 *2* *3* *4* *5* *6*

Never *Very often*

Appendix E

Objective Numeracy Scale

1. Imagine that we rolled a fair, six-sided die 1,000 times. Out of 1,000 rolls, how many times do you think the die would come up even (2, 4, or 6)? _____
2. In the BIG BUCKS LOTTERY, the chances of winning a $10.00 prize is 1%. What is your best guess about how many people would win a $10.00 prize if 1,000 people each buy a single ticket to BIG BUCKS? _____
3. In the ACME PUBLISHING SWEEPSTAKES, the chance of winning a care is 1 in 1,000. What percent of tickets to ACME PUBLISHING SWEEPSTAKES win a car?

   _____
4. Which of the following represents the biggest risk of getting a disease?

   _____ 1 in 100

   _____ 1 in 1000

   _____ 1 in 10
5. Which of the following numbers represents the biggest risk of getting a disease?

   _____ 1%

   _____ 10%

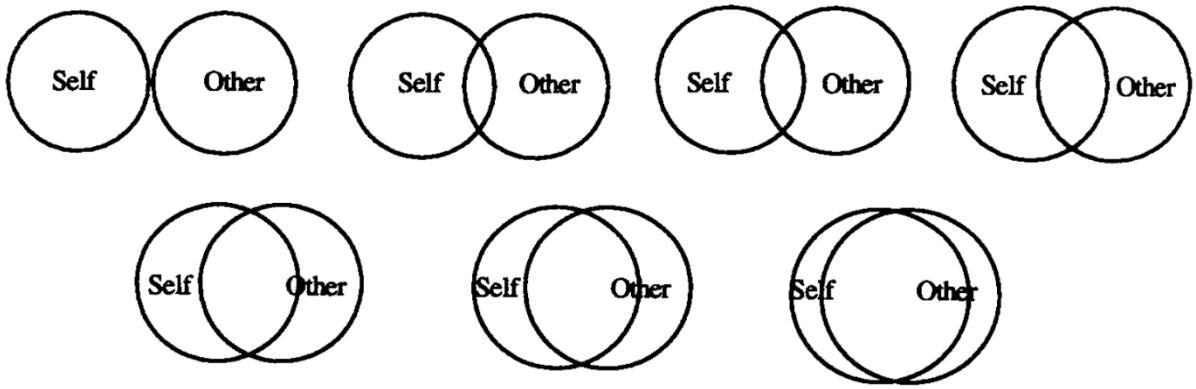
   _____ 5%
6. If person A's risk of getting a disease is 1% in ten years, and person B's risk is double that of A's, what is B's risk? _____
7. If person A's chance of getting a disease is 1 in 100 in ten years, and person B's risk is double that of A's, what is B's risk? _____

8. If the chance of getting a disease is 10%, how many people out of 100 would be expected to get the disease?
    a. Out of 100? _____
    b. Out of 1000? _____
9. If the chance of getting a disease is 20 out of 100, this would be the same as having a _____ % of getting the disease.
10. The chance of getting a viral infection is .005. Out of 10,000 people, about how many of them are expected to get infected?

Appendix F

Inclusion of Other in the Self Scale

Instructions: Please circle the picture below which best describes your relationship with the other person whom you participated with today.



Appendix G

Instructions for Investment Scenario Given to Participants

Investment Scenario Instructions

1. Select 11 cards from the piles
    a. You can pick all 11 from one type of question or can be from a mix of Easy and Hard questions.

2. Place cards on the board so you cannot see the questions.

3. Roll the dice.

4. The experimenter will write down which question corresponds with your roll to ask the third participant once you have completed all the rounds of the investment scenario.

Example: If you roll the dice and one die shows a 4 and the other shows a 3, the experimenter will write down which question is on the 7 slot.

Appendix H

Reward Structure for Each Round Given to Participants

Round A Rewards

For Client

Your client begins the round with 12 raffle entries.

Difficulty of Question Corresponding to Dice Roll	Third Participant Answers	Change in *Client's* Number of Entries	Total Number of *Client's* Entries for this Round
Easy	Correctly	+6	18
Hard	Correctly	+12	24
Easy or Hard	Incorrectly	-12	0

For Self

You do not have the opportunity to earn any raffle entries this round.

Round B Rewards

For Client

Your client begins the round with 12 raffle entries.

Difficulty of Question Corresponding to Dice Roll	Third Participant Answers	Change in *Client's* Number of Entries	Total Number of *Client's* Entries for this Round
Easy	Correctly	+6	18
Hard	Correctly	+12	24
Easy or Hard	Incorrectly	-12	0

For Self

You begin the round with 0 raffle entries.

- Earn 1 raffle entry for EACH easy question on board
- Earn 2 raffle entries for EACH hard question on board
- Doesn't matter if third person gets the question right

Total Raffle Entries You Earn = 1(#easy questions on board) + 2(# hard questions on board)

Example:

6 easy questions & 5 hard questions → 6 entries + 10 entries = 16 entries

Round C Rewards

For Client

Your client does not have the opportunity to earn any raffle entries this round.

For Self

You begin the round with 12 raffle entries.

Difficulty of Question Corresponding to Dice Roll	Third Participant Answers	Change in *Your* Number of Entries	Total Number of *Your* Entries for this Round
Easy	Correctly	+6	18
Hard	Correctly	+12	24
Easy or Hard	Incorrectly	-12	0

Vita

Jessica Rose Carre was raised in Charlotte, NC. The only daughter of Robin Hicks and David Strawn, she graduated from Furman University in May 2013. During her time at Furman she worked in several research laboratories and completed an honor's under the supervision of Frank Provenzano, PhD.

As a graduate student Jessica has published three first authored papers in places such as the Journal of Personality Disorders, Review of General Psychology, and Journal of Personality and Individual Differences. She has also presented three posters at national psychology conferences such as the Society for Personality and Social Psychology. Broadly, her research focuses on decision making among those high in Dark Triad traits – a group of three personality traits associated with interpersonal manipulation and a lack of empathy.

During her time as a graduate student, she has taught a course writing psychological studies twice and has worked as a program evaluator for a year and a half. She has also served as an ad-hoc reviewer for the Journal of Personality and Individual Differences. Jessica will continue her studies as a doctoral student in the Legal Psychology program at the University of Texas at El Paso.

Contact Information: jrcarre@miners.utep.edu