

THE INFLUENCE OF DARK TRIAD TRAITS AND FRAMING EFFECTS
ON COOPERATION IN NON-ZERO-SUM GAMES

by

STEPHEN MARK DOERFLER

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Abstract

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Stephen Mark Doerfler, MS

The University of Texas at Arlington, 2021

Supervising Professor: Daniel S. Levine

Over the past two decades, personality research has increasingly focused on describing the selfish, callous, and impulsive qualities that are present in individuals with higher levels of Dark Triad traits (i.e., narcissism, psychopathy, and Machiavellianism). However, little is known about the situational factors that contribute to the selfish behavior of these individuals. The current investigation aimed to address this gap in the literature by combining personality and cognitive theories of decision making to examine the relationship between the Dark Triad traits and uncooperative behavior under different risk and valence framing conditions in one-shot non-zero-sum games. Participants were randomly assigned to one of four conditions based on a 2 (gain vs. loss framing) × 2 (normal- vs. high-risk condition) between-subjects design. The prisoner's

dilemma game was used to represent normal risk and the chicken game was used to represent high risk. Overall, results supported prospect theory predictions regarding the effect valence framing has on decision making under risk and replicated previous findings regarding valence framing effects in the absence of risk. This investigation did not uncover a significant main effect of Dark Triad traits on cooperation. However, the Dark Triad traits and framing conditions did interact to predict differences in cooperation, partially supporting recent fuzzy-trace theory predictions. In addition, the current investigation uncovered nuances among the Dark Triad traits in relation to callousness and impulsiveness; and, in an exploratory analysis, a relationship between the Dark Triad traits and study attrition. Detailed findings and future directions are discussed.

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Chapter 1

In 1962, Cold War tensions were at an all-time high as a result of the Cuban Missile Crisis. U.S. and Soviet leaders each had to decide what actions they would take to defend their citizens, while also anticipating the actions of the other country. Among the potential outcomes for U.S., Soviet, and Cuban citizens, the worst possible outcome would have been nuclear war, while the best possible outcome (i.e., no war) would have to come from cooperation between U.S. and Soviet leaders, making the scenario a non-zero-sum game. In the end, leaders of both countries came to a mutual agreement to cooperate and avoid war. However, the outcome may have been different had other leaders been responsible for making these decisions and had military intelligence surrounding the events been framed differently. In the current investigation, I examine the extent to which individual differences and situational context influence cooperative decision making in non-zero-sum games.

The decision to cooperate (or not) with others is a part of everyday life, be it allowing someone to merge onto the highway, contributing equally to a work or school project, or returning a shopping basket. For the most part, cooperative behavior is encouraged by others and is considered the foundation of society as part of a social contract (Gauthier, 1986; Hobbes, 1651). Personality traits that promote cooperative behavior

are, therefore, considered to be socially desirable. In contrast, traits that promote deception, devaluing others, and criminal tendencies are considered to be socially *undesirable*. Generally, these socially undesirable traits are both discouraged by and disadvantageous for society. However, socially undesirable traits do persist at a non-zero frequency in the population and have consequences both for those with those traits and for those whom they encounter.¹

1.1 The Dark Triad

Among all the socially undesirable traits, those that make up the so-called Dark Triad have arguably garnered the most attention in personality research over the last two decades. The Dark Triad refers to three socially aversive personality traits that are distinct yet correlated: subclinical *narcissism*, subclinical *psychopathy*, and *Machiavellianism* (Paulhus & Williams, 2002). Narcissism is characterized by grandiosity and entitlement; psychopathy is characterized by callousness and impulsiveness; and Machiavellianism is characterized by manipulative and deceitful behavior. These three Dark Triad traits are often studied together

¹ A common misunderstanding is that socially undesirable traits do not serve an evolutionarily adaptive purpose. This misunderstanding comes, in part, from a confusion between the collective societal benefits of a trait and the benefits to the individual. While there are some evolutionary benefits of certain traits (e.g., honesty, humility, agreeableness) that promote cooperation, traits do not have to benefit others in order to be evolutionary beneficial to the individual (Jonason & Burtaverde, in press)

due to their considerable overlap. Together, the three traits represent a constellation of “evilness” with low honesty-humility at the core² (Book et al., 2016).

The shared aspects of the Dark Triad traits represent an approach to life that is grandiose but ultimately self-defeating (Jonason & Burtaverde, in press; Jonason, Koenig, & Tost, 2010). On one hand, individuals with higher levels of Dark Triad traits are more successful than others in acquiring leadership roles (Furnham, 2010), in attracting mates (Jonason et al., 2009), and at doing tasks that require competitiveness (Jonason, Li, & Teicher, 2010). On the other hand, the Dark Triad traits show consistent relationships with a variety of psychosocial consequences, such as aggression, impulsivity, loneliness, lying, infidelity, substance abuse, a lack of empathy, and a weak and unstable sense of self (Doerfler et al., in press; Doerfler & Kaiser, 2021; Muris et al., 2017).

To explain the duplicity of the Dark Triad, and why the socially undesirable aspects of the Dark Triad (e.g., selfishness) persist in a non-zero frequency in the population, some researchers have argued that the Dark Triad traits represent a *fast life history* strategy (Jonason, Koenig, & Tost, 2010). Life history refers to a mid-level evolutionary theory that

² Among the potential cores of the Dark Triad, low honesty-humility and an alternative life history strategy have garnered the most theoretical and empirical support (Book et al., 2016).

describes individual tradeoffs between longevity and reproductive efforts (e.g., time spent mating). A slow life history strategy is characterized by having fewer mates and investing more time into one's offspring. In contrast, a fast life history strategy is characterized by a pattern of multiple instances of short-term mating (e.g., one-night stands). Although humans typically engage in a slow life history strategy, certain individual differences (e.g., Dark Triad traits) may result in a fast life history strategy for some people (Rushton, 1985). Moreover, a fast life history may explain why the socially undesirable aspects of the Dark Triad (e.g., selfishness) persist in a non-zero frequency in the population.

Life history theory may explain why individuals with higher levels of callousness and impulsivity (i.e., those with higher levels of Dark Triad traits) value getting ahead of, rather than getting along with, other individuals (Jonason & Zeigler-Hill, 2018). For example, men typically have higher levels of Dark Triad traits than women (Jonason et al., 2013). In terms of reproductive fitness, men have more to gain by having multiple, short-term partners than women do. In addition to increased short-term and exploitative mating patterns, individuals with higher levels of Dark Triad traits also show limited motivation to maintain good relationships with others (Jonason & Zeigler-Hill, 2018) and exhibit a preference for immediate gratification at the cost of higher, future rewards

(Malesza & Kalinowski, 2019). Taken together, these behaviors demonstrate the selfish, competitive, and often self-destructive nature of people with higher levels of Dark Triad traits. The unique combination of callous and impulsive aspects of the Dark Triad traits may be beneficial in the short term, but these gains often come at the expense of the self and others.

1.1.1 Narcissism

In addition to the shared aspects of the Dark Triad that facilitate selfishness, there are notable distinctions among the three traits that may differently relate to the decision-making processes of individuals with Dark Triad traits. Among the three Dark Triad traits, narcissism is perhaps the most overtly distinct. Moreover, narcissism is often referred to as the “lightest” Dark Triad trait, because narcissism, in comparison to psychopathy and Machiavellianism, is less related to antisocial behavior and more related to socially appropriate—even if undesirable—behaviors (Nagler et al., 2014; Rauthmann & Kolar, 2012).

On the whole, narcissism is considered to represent a combination of grandiosity, entitlement, and impulsivity (Morf & Rhodewalt, 2001). In the clinical literature, the interpersonal and intrapersonal processes are described by two systems: the cool and calculated system and the hot and impulsive system (Morf & Rhodewalt, 2001). However, in personality

research, these features of narcissism are commonly split into two main facets that describe different intensities of the two main narcissistic traits: grandiose narcissism and vulnerable narcissism (Miller & Campbell, 2008). Grandiose narcissism specifically refers to the grandiose and callous aspects of narcissism (e.g., desire to show off), whereas vulnerable narcissism refers to the impulsive and hypersensitive aspects of narcissism (e.g., being sensitive when receiving feedback from others).

Taken together, these two traits (i.e., grandiose and vulnerable narcissism) may explain some of the paradoxical behavior of narcissists. For instance, narcissists are competitive and want to be successful and admired. In fact, when they feel excluded, narcissists experience social pain—an intense distress caused by the rejection of others (Cascio et al., 2015). Consequently, impulsiveness and fear of rejection often interfere with the success of narcissists. In order to regulate their fragile self-esteem, narcissists are likely to make impulsive and irrational decisions that can harm themselves and others (e.g., in response to negative feedback from others, narcissists typically demonstrate distorted recall of events and engage in aggressive behaviors; Morf & Rhodewalt, 2001).

This competitiveness and drive to succeed is indicative of how narcissistic individuals are driven largely by self-centered mechanisms. That is, the socially appropriate behaviors observed in narcissists are

generally a means to an end rather than a display of genuine empathy. For most people, empathy is a key mechanism driving socially appropriate behavior, such as cooperation; however, it has been well established that narcissists exhibit difficulties with affective empathy (Heym et al., 2019; Jonason & Krause, 2013; Nagler et al., 2014; Wai & Tiliopoulos, 2012). Less is known about narcissists' ability to engage in cognitive empathy—the ability to understand the emotions of others without necessarily feeling those emotions (Jonason & Krause, 2013; Wai & Tiliopoulos, 2012). Somewhat surprisingly, narcissism is related to an increased ability to display and regulate one's own emotions (Nagler et al., 2014). Such a trait may help narcissists support their grandiose self-view by behaving in socially appropriate ways with others. However, they do not necessarily need to be empathetic to maintain their grandiose self-image in their social interactions.

1.1.2 Psychopathy

Psychopathy is arguably the darkest—that is, least empathetic—of the three Dark Triad traits. Similar to narcissism, personality researchers have split psychopathy into two main facets: primary and secondary psychopathy (Levenson et al., 1995). Primary psychopathy specifically refers to the cold and calculating aspects of psychopathy and shares aspects of general callousness with grandiose narcissism. In contrast,

secondary psychopathy refers to the impulsive and anxious aspects of psychopathy and shares aspects of general impulsivity with vulnerable narcissism. Also similar to narcissism, psychopathy is negatively related to affective empathy and has shown inconsistent results in regard to cognitive empathy (Jonason & Krause, 2013; Wai & Tiliopoulos, 2012). A recent meta-analysis on the Dark Triad traits indicated that, compared to narcissism and Machiavellianism, psychopathy accounts for the most variance related to the socioemotional deficits in individuals with Dark Triad traits (Muris et al., 2017). Moreover, compared to narcissism and Machiavellianism, psychopathy is associated with poorer emotional regulation and expression (Heym et al., 2019; Muris et al., 2017; Nagler et al., 2014).

Psychopathy also differs from the other Dark Triad traits in regard to risky decision making. Although all three Dark Triad traits are related to chronic patterns of unhealthy gambling and aggression-delinquency, psychopathy accounts for the most variance (Muris et al., 2017; Trombly & Zeigler-Hill, 2017), which could owe to the fact that the underlying motivations for risky decision making differ among the three Dark Triad traits: Whereas narcissists are likely to engage in addictive behavior to achieve self-regulatory goals, psychopaths are driven by a less directed disinhibition (Doerfler & Kaiser, 2021; Jauk & Dieterich, 2019). Indeed,

neurological evidence suggests that both narcissists and psychopaths have different, abnormal functioning of the default mode network (Pujol et al., 2018). Among other important processes, the default mode network is responsible for an individual's integration of self with the outside world. For narcissists, this abnormal default mode network functioning seems to play a role in their weak sense of self. In contrast, for psychopaths, this abnormal default mode network functioning seems to be responsible for removing self-conscious emotions, such as empathy, from decision making.

1.1.3 Machiavellianism

Machiavellianism is believed to have a strong overlap with psychopathy. Similar to psychopaths, Machiavellians have a tendency to behave unethically and will manipulate others to achieve personal goals, regardless of the effect their decisions have on others (Christie & Geis, 1970; Greenbaum et al., 2017; Wilson et al., 1996). Machiavellians tend to score high on fluid intelligence and they are careful planners (Bereczkei et al., 2015; Christie & Geis, 1970; Kowalski et al., 2018). Unlike narcissism and psychopathy, the qualities of Machiavellianism are represented by a single construct (Christie & Geis, 1970), one that is most closely aligned with the general callousness associated with grandiose narcissism and primary psychopathy.

In regard to empathy, similar to psychopathy, Machiavellianism is negatively related to affective empathy and has shown inconsistent results in comparison to cognitive empathy (Jonason & Krause, 2013; Wai & Tiliopoulos, 2012). Although they are similar, the empathic deficits of Machiavellians are less severe than those of psychopaths and relate differently to behavior (Heym et al., 2019). For Machiavellians, empathic information can help them understand situational context during decision making. Bereczkei et al. (2015) suggested that Machiavellians use this situational awareness to their advantage to win against others. Specifically, Machiavellians assess moral values and devise strategic approaches to use these norms to their benefit.

1.1.4 Impulsiveness and Callousness

On the whole, the five components of the Dark Triad—grandiose narcissism, vulnerable narcissism, primary psychopathy, secondary psychopathy, and Machiavellianism—collectively represent a competitive approach to life that is driven by callousness and impulsivity (Jones & Figuerdo, 2013; Jones & Paulhus, 2011; Malesza, 2020a; Miller et al., 2010). Although all five of the Dark Triad components are related to both callous and impulsive qualities, grandiose narcissism, primary psychopathy, and Machiavellianism are more related to callousness, whereas vulnerable narcissism and secondary psychopathy are more

related to impulsivity (Doerfler et al., in press; Lyons, 2019; Miller et al., 2010).

Impulsivity and callousness are both related to an increase in risk-seeking behavior. However, the two are differently related to the motivations behind taking risk. Specifically, impulsiveness is related to higher levels of risk seeking due to the associations between impulsivity, reward hypersensitivity (i.e., more likely to choose options with higher rewards), a lack of consequential thinking, and a lack of self-control (Lyons, 2019; Martin & Potts, 2004; Miller et al., 2010; Wallace et al., 2009). In contrast, callousness is less related to reward sensitivity, and more related to an evaluative, opportunistic, and exploitative approach to risk (Book et al., 2016; Bereczkei & Czibor, 2014; Christie & Geis, 1970).

Nonetheless, while callousness and impulsivity each uniquely influence risky decision making, other factors may also influence one's decision-making process. A growing body of research has indicated that, in addition to individual differences, decision making is influenced by context (e.g., Deutchman & Sullivan, 2018; Doerfler et al., 2021; Figner & Weber, 2011). However, the relationship between Dark Triad traits and context of decision making has been understudied. In the following section, I discuss how context influences decision making, namely, through *framing effects*.

1.2 Framing Effects

Under situations of uncertainty, cognitive biases exert a strong influence on our judgement and decision-making processes. One of the most well-studied of these cognitive biases is the framing effect. The framing effect refers to a bias whereby people tend to choose one option over another based largely—if not exclusively—on semantic information. That is, when given two options that have similar expected values but that are framed differently in regard to valence (positive or negative), individuals show bias in their choice (Doerfler et al., 2021; Tversky & Kahneman, 1981). Specifically, people tend to choose riskier options (i.e., are more risk-seeking) when outcomes are framed as potential losses but choose the less risky options (i.e., are more risk averse) when outcomes are framed as potential gains. These assumptions were initially outlined under Kahneman and Tversky's (1979) prospect theory.

Prospect theory was first demonstrated through Tversky and Kahneman's (1981) depiction of a hypothetical disease problem. Participants were assigned to one of two conditions: a gain frame or a loss frame. They were then given a choice between two programs for how to treat a hypothetical deadly disease that had infected 600 people. One program provided a certain outcome, while the other provided a probabilistic outcome. In the gain frame, the outcomes were worded in

terms of saving lives. The certain outcome was to adopt a program that would save 200 lives; the uncertain outcome was to adopt a program that had a one-third probability of saving everyone and a two-thirds probability of saving no one. In the loss frame, the outcomes were framed as lives lost. The certain outcome was to adopt a program that would result in 400 deaths; the uncertain outcome was to adopt a program that had a one-third probability that no one would die and a two-thirds probability that everyone would die. Although the options in the gain and loss frame were numerically and probabilistically equivalent, 72% of participants chose the risk-averse (i.e., certain) option in the gain frame (save 200 lives), whereas 22% of participants chose the equivalent risk-averse option in the loss frame (400 deaths).

This framing effect has been replicated in a variety of scenarios, proving to be a robust phenomenon. For example, in one study, participants were given the choice between receiving social security payments early or postponing their initial payment (Brown et al., 2016). In both frames, participants would receive the same increase in payments if they decided to postpone. However, when postponing payments was framed as a gain (delaying the claim by one year would result in a \$X per month increase of benefits), participants were more likely to postpone than when the postponing was framed as a loss (claiming one year earlier

would result in a \$X per month decrease in benefits). In another study, framing effects were analyzed in relation to young adults' intentions to use condoms (Linville et al., 1993). When condom effectiveness against sexually transmitted infections was framed as a gain (a 95% success rate), young adults were more likely to agree to use a condom than when condom effectiveness was framed as a loss (a 5% failure rate).

These framing effects can even extend to decisions where risk is not a factor in the uncertainty. In studies that have examined resource allocation strategies, valence framing has consistently predicted decision making even when there is no risk involved (e.g., De Haus et al., 2010; Deutchman & Sullivan, 2018; Goerg et al., 2017; McCusker & Carnevale, 1995), suggesting a general tendency of people tend to be gain-seeking and loss-averse. That is, individuals tend to choose the more cooperative option when outcomes are framed as gains; however, when outcomes are framed as losses, individuals are more likely to behave selfishly.

Overall, meta-analyses have shown that framing has a small to moderate effect on decision making (Gallagher & Updegraff, 2012; Kuhberger, 1998). However, there have been notable exceptions to expected framing effects as predicted by prospect theory. For instance, age may have more of an effect on decision making than does the framing effect (Reyna & Farley, 2006). In the following section, I discuss how age

and other individual differences influence decision making in framing tasks as described by *fuzzy-trace theory*.

1.2.1 Fuzzy-trace Theory

One theory for differential processing in framing tasks is fuzzy-trace theory (Reyna & Brainerd, 1995). According to fuzzy-trace theory, when evaluating between options, people either take a calculated and precise approach (i.e., verbatim-based processing) or an imprecise but meaningful approach (i.e., gist-based processing). The approach chosen (verbatim or gist) impacts the decision the individual makes. For example, in the classic trolley problem, participants are asked whether or not they would sacrifice an innocent person to save five people. When presented with the trolley problem, most adults choose not to sacrifice the one innocent person even though it would result in the death of the other five people (Bartels & Pizarro, 2011). The reason why most adults make this decision is due to their dominant gist approach in decision making. In the trolley example, a gist process would lead a person to consider the morality of their actions (e.g., choosing to kill someone is worse than letting someone die; Broniatowski & Reyna, 2018). In contrast, a verbatim process would cause people to be more analytical, leading them to choose to sacrifice one person in order to save five, because five is greater than one.

In regard to framing effects, individuals who adopt a gist approach are more likely to be influenced by the valence of a message (Kühberger & Tanner, 2010). For example, in the previous disease problem, the simple gists of the two gain-framed options can be reduced to the following options: (a) “some people will be saved” and (b) “some people will be saved or no one will be saved” (Reyna & Brainerd, 1991). On the other hand, the simple gists of the loss-framed options can be reduced to the following options: (c) “some people will die” and (d) “some people will die or no one will die.” According to fuzzy-trace theory, the simple gists of these options may explain why people tend to be more risk-averse when messages are framed as potential gains and risk-seeking when messages are framed as potential losses. However, children, who tend to be verbatim thinkers, do not show such bias in framing tasks (Reyna & Farley, 2006). Rather, their willingness to take risks is related to the probability of success. In other words, if there is a larger probability of winning than losing in a risky option, children are more likely to choose the risky option.

In addition to age, other individual differences, namely, autism and psychopathy, may lead a person to adopt a verbatim approach over a gist approach (Reyna & Panagiotopoulos, in press). Of the two, individuals with autism are more likely to be true verbatim thinkers than are

individuals with psychopathy. That is, individuals with autism are more likely to process information with no regard to framing, thereby choosing actions that they perceive to be more logical. In contrast, individuals with psychopathy are more impulsive and more likely to be incentivized by larger rewards (Buckholtz et al., 2010; Costello et al., 2019). According to fuzzy-trace theory, psychopaths should be verbatim processors in most framed tasks (Reyna & Panagiotopoulos, in press). However, unlike individuals with autism, when the potential gain from taking a risk is high, psychopaths are more likely to be risk takers (Costello et al., 2019; Reyna & Panagiotopoulos, in press). Moreover, while both the callous and impulsive aspects of psychopathy are related to reward sensitivity, impulsiveness is more strongly related to reward sensitivity.

While psychopathy makes people more likely to adopt a verbatim processing approach as compared to a gist approach (Reyna & Panagiotopoulos, in press), less is known about the other Dark Triad traits. Recently, Carre and Jones (2017) proposed that Machiavellianism will lead people to be more likely to adopt a gist-based approach in their decision making. However, the gist approach of the Machiavellian is different from that of other adults. Specifically, the gist processing of Machiavellianism includes a bias towards selfishness and immoral values (Carre & Jones, 2017; Tajmirriyahi et al., 2021). More specifically,

individuals high on Machiavellianism are more likely to activate a selfish gist approach when they would directly benefit from their decision, especially in a one-shot game, where there is no opportunity for retaliation from other players. For example, in a framing effect (gain vs. loss) study where individuals directly benefited by choosing one of two possible options, individuals high on Machiavellianism were more likely to choose the most selfish outcome (Deutchman & Sullivan, 2018). However, when participants would not directly benefit from choosing between two possible framed (gain vs. loss) outcomes, those high on Machiavellianism did not differ from other participants (Doerfler et al., 2021).

As previously mentioned, the five Dark Triad components are differently related to impulsivity and callousness. Impulsivity is related to greater risk-taking behavior, especially in gain frames (Costello et al., 2019; Dehaene et al., 2003). In contrast, callousness is related to careful analysis of risk-reward tradeoffs. As such, in a competitive game, under normal-risk conditions, both callousness and impulsivity should predict betraying one's partner if the end result is a higher possible reward (Malesza, 2020a). However, under high-risk conditions, the more impulsive Dark Triad traits (i.e., vulnerable narcissism and secondary psychopathy) may be stronger predictors of betraying one's partner than are the callous components (i.e., grandiose narcissism, primary

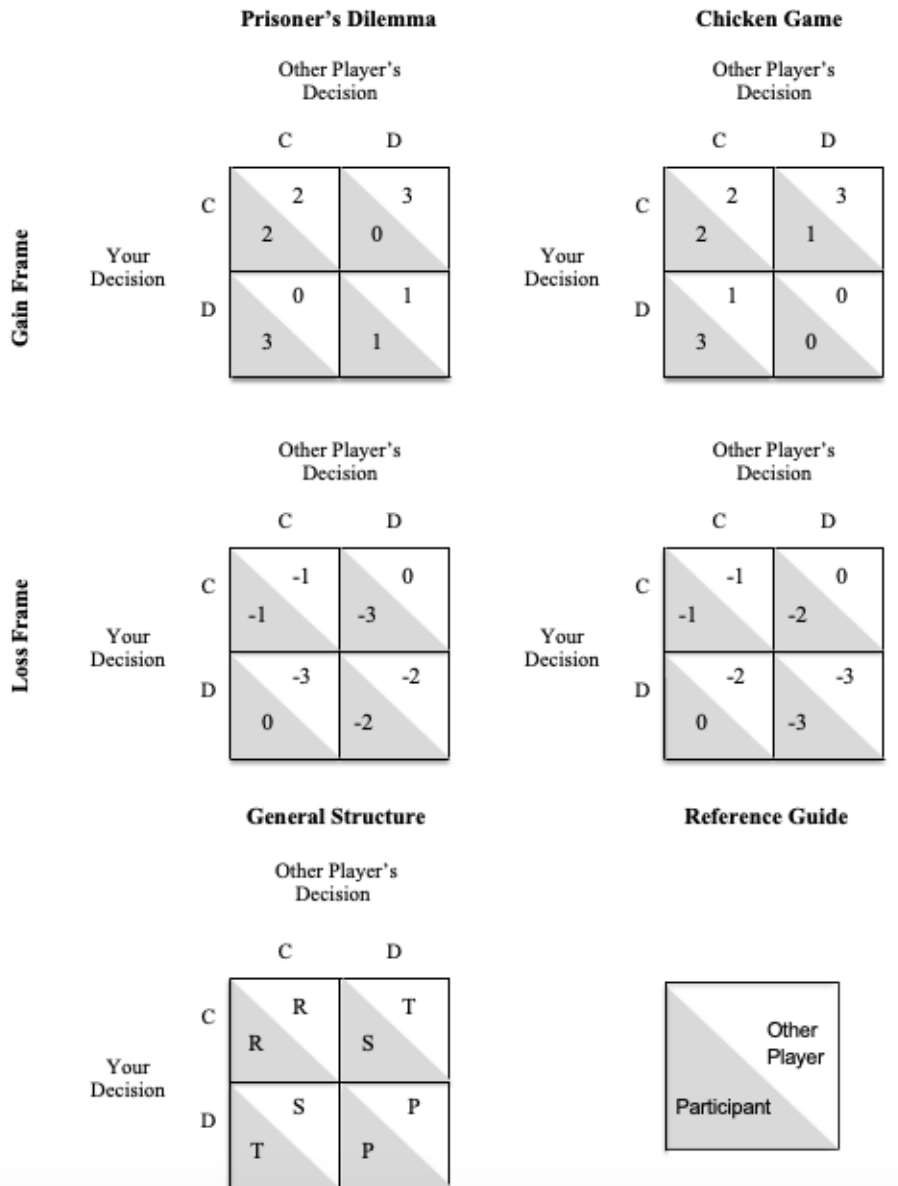
psychopathy, and Machiavellianism) as a result of the increased risk-reward ratio.

1.2.2 Prisoner's Dilemma and Chicken Game

In order to test the relationship between Dark Triad traits, framing effects, and cooperative behavior, two non-zero-sum games are used in the present study: the prisoner's dilemma and the chicken game. The prisoner's dilemma is a widely used game to measure cooperative and selfish behaviors. In the prisoner's dilemma, two players have to independently choose whether they will cooperate with (*C*) or defect against (*D*) the other player. If both players choose to cooperate, then they both receive an equal reward payoff (*R*). However, if both players chose to defect, then they will both receive an equal punishment payoff (*P*), which is worse than *R*. In the case where one participant cooperates and the other defects, the defector receives the temptation payoff (*T*), which is the best possible payoff, while the cooperator receives the sucker payoff (*S*), which is the worst possible outcome. The overall payoff structure for the prisoner's dilemma is in the following order: $T > R > P > S$ (see Figure 1). Thus, in order to maximize their potential payoff, it is better for an individual to defect than cooperate ($T > R$ and $P > S$). However, it is better for both players to cooperate than for both players to defect ($R > P$).

Figure 1

Payoff Structures for the Gain- and Loss-Framed Versions of the Prisoner's Dilemma and the Chicken Game



Note. C = Cooperate; D = Defect; R = Reward Payoff; P = Punishment Payoff; T = Temptation Payoff; S = Sucker Payoff. Adapted from "Framing prisoners and chickens: Valence effects in the prisoner's dilemma and the chicken game" by P. de Heus, N.

Hoogervorst, and E. van Dijk, 2010, *Journal of Experimental Social Psychology*, 46, p. 737. Copyright 2010 by Elsevier Inc. Adapted with permission.

The chicken game is similar in many ways to the prisoner's dilemma. In both games, two players must independently choose whether they will cooperate with or defect against the other player in order to receive a certain payoff. The major difference between the two games is the order of the payoff structure. In the chicken game, the payoff structure is as follows: $T > R > S > P$. If only one player defects, that player still receives a higher payoff than they would if both players cooperate ($T > R$). However, unlike the prisoner's dilemma, the worse possible payoff occurs when both participants defect instead of when only one player cooperates ($S > P$).

The inversion in the S and P payoffs structure between the prisoner's dilemma and the chicken game can impact a player's decision to cooperate or defect. Previous research has indicated that people are less likely to defect in the chicken game in comparison to the prisoner's dilemma (De Haus et al., 2010; Rapoport & Chammah, 1969). One potential reason for this difference is the influence of fear in decision-making strategy. If participants are fearful of the worst possible payoff outcome, they may be more likely to make their choice (to cooperate or defect) as a way to avoid that outcome. In the prisoner's dilemma, the worst possible outcome (i.e., S) could occur if a player decides to

cooperate. Moreover, defection is the most strategic choice because it results in better payoffs for the individual, regardless of the other player's decision. However, in the chicken game, the worst possible payoff outcome (i.e., P) could occur if a player decides to defect. If fear is a stronger motivator than self-interest, then players should decide to cooperate in the chicken game to avoid P .

Although it is unclear which choice (cooperation or defection) is riskier in the prisoner's dilemma, it is easier to identify the riskier option in the chicken game. The element of risk in the chicken game, as compared to the prisoner's dilemma, comes from the difference in potential outcome variance based on the decision to cooperate or defect (De Haus et al., 2010). If a player chooses to cooperate in the chicken game, they will receive one of the two middle payoffs (low outcome variance), making cooperation the safe, less risky option. However, if a participant chooses to defect, they will either receive the best or the worst possible outcome payoffs (high outcome variance), making defection the riskier option. Moreover, the difference in the variance between the two outcomes for defecting (P and S) in the chicken game is three times that of cooperating (R and S). In contrast, in the prisoner's dilemma, the variances of the two outcomes for cooperating (R and S) and defecting (P and T) are equal (see Figure 1). Therefore, in the current investigation, the prisoner's

dilemma will serve as the normal-risk condition and the chicken game will serve as a high-risk condition.

An additional consideration when playing such games is whether they are played one time (one-shot game) or are played repeatedly against the same opponent (iterative game). Iterative games introduce the potential of strategic planning and retaliation since players are able to see and respond to the decisions of their opponent after each round; in a one-shot game, on the other hand, we can test cooperation or defection intentions based off one-off encounters. A real-world example of an iterative game is two adjacent gas stations who are competing to sell the lowest price gas. If one gas station lowers the price of their gas, so might the other, leading to a loss of profits for both gas stations. In contrast, the Cuban Missile Crisis is an example of a one-shot game. If either the United States or the Soviet Union decided to engage in nuclear warfare, it would have led to the nuclear destruction of both countries. In order to assess cooperative tendencies of individuals in one-off interactions with a stranger—without the confounds of long-term strategizing or retaliation—a one-shot game design was used in the current investigation.

1.3 The Current Study

In the present investigation, I examined the role of dark personality traits (Dark Triad traits, impulsivity, and callousness) and framing effects

(valence and risk) in regard to cooperative behavior. Cooperative behavior was assessed using a gain- and a loss-framed version of the one-shot prisoner's dilemma and chicken game. The prisoner's dilemma (normal-risk condition) and chicken game (high-risk condition) were used to measure risk framing effects. The gain and loss frames were used to measure valence framing effects. Participants started with no points in the gain frame and three points in the loss frame. In the gain frame, potential outcomes of the game were framed as points gained. In the loss frame, potential outcomes were framed as points lost.

1.3.1 Hypothesis 1

Valence framing effects are known to impact decision making such that individuals are more likely to cooperate with others when outcomes are framed as gains but behave selfishly when outcomes are framed as losses (Deutchman & Sullivan, 2018; McCusker & Carnevale, 1995). Therefore, I hypothesized that, in the prisoner's dilemma game (normal-risk condition), people would be more likely to defect when outcomes are presented as potential losses as opposed to potential gains.

1.3.2 Hypothesis 2

When risk is more apparent in a game, framing effects should be stronger (De Heus et al., 2010). In the prisoner's dilemma (normal-risk condition), the worst possible outcome for the individual occurs when they

choose to cooperate, and their partner chooses to defect. However, in the chicken game (high-risk condition), the worst possible outcome for the individual occurs when both they and their partner defect (see Figure 1). Following predictions made by prospect theory (Kahneman & Tversky, 1979), and in replication of previous research (De Heus et al., 2010), I hypothesized that, in the chicken game, individuals would be more likely to defect when outcomes are presented as potential losses as opposed to gains. That is, people will choose the riskier option (i.e., between the possibility of no loss and the possibility of the greatest loss) in order to avoid a certain loss. Moreover, the framing effect should be stronger in the chicken game in comparison to the prisoner's dilemma game.

1.3.3 Hypothesis 3

As discussed earlier, callousness and impulsiveness are motivating factors that drive decision making in individuals with higher levels of Dark Triad traits (e.g., Jones & Figuerdo, 2013; Jones & Paulhus, 2011; Malesza, 2020a; Miller et al., 2010). Moreover, while all five Dark Triad trait components should be related to callousness and impulsivity, certain components should be more related to callousness (i.e., Machiavellianism, primary psychopathy, and grandiose narcissism) and others to impulsivity (i.e., vulnerable narcissism and secondary psychopathy) (Doerfler et al., in press; Miller et al., 2010). Therefore, I hypothesized that the five Dark

Triad components would each be positively related to impulsivity and callousness. However, after controlling for the shared variance among the five components, Machiavellianism, primary psychopathy, and grandiose narcissism would be the only predictors of callousness, whereas vulnerable narcissism and secondary psychopathy would be the only predictors of impulsivity.

1.3.4 Hypothesis 4

According to life history theory, individuals with higher levels of Dark Triad traits are more likely than others to betray someone if they have something to gain from it (Jonason & Burtaverde, in press; Jonason, Koenig, & Tost, 2010). In the present study, and in replication of previous research (Malesza, 2020a), both impulsive and callous aspects of the Dark Triad should be related to defection intentions. Specifically, impulsive aspects of the Dark Triad should be related to defection because, regardless of risk condition, defection can lead to the best possible reward. It should be noted that callous aspects of the Dark Triad should also be related to defection in a one-shot game because the participant does not have to worry about retaliation from their partner. Therefore, I hypothesized that, after controlling for framing conditions, each of the five Dark Triad components would predict defecting in both the prisoner's

dilemma and the chicken game. In addition, callousness, impulsivity, and their interaction would predict defection in both games.

1.3.5 Hypothesis 5

As previously mentioned, most adults are cooperative when scenarios are framed as potential gains and selfish when scenarios are framed as potential losses. In the prisoner's dilemma, this should translate to more cooperation in the gain frame and more defection in the loss frame. In contrast, due to their selfishness and competitiveness, individuals with higher levels of Dark Triad traits should be more likely to defect rather than cooperate in both frames of the prisoner's dilemma. Consequently, in the gain frame of the prisoner's dilemma, Dark Triad traits should predict higher rates of defection. However, since participants overall are expected to choose defection at a higher rate in the loss frame, Dark Triad traits should not predict higher rates of defection in the loss frame of the prisoner's dilemma (Reyna & Panagiotopoulos, in press).

1.3.6 Hypothesis 6

Although callousness and impulsiveness should both be predictors of defection, the two should be differently related to decision making under various levels of risk (Carre & Jones, 2017; Miller et al., 2010; Reyna & Panagiotopoulos, in press). Impulsivity is related to taking higher risks when potential rewards are high (Costello et al., 2019; Dehaene et al.,

2003), while callousness, in contrast, is related to a more careful analysis (i.e., verbatim approach) of risk-reward tradeoffs. In the chicken game (high-risk condition), without the influence of impulsivity, callousness should not predict risk-seeking behavior (in this case, defecting).

Therefore, I hypothesized that, when outcomes are presented as potential gains in the chicken game, impulsivity would predict defecting behavior.

However, in the same frame condition, callousness alone would not predict defecting behavior after controlling for impulsivity and the interaction between callousness and impulsivity. Moreover, in the same frame condition, all five Dark Triad components would predict defection intentions; however, after controlling for shared variance among the five components, vulnerable narcissism and secondary psychopathy would be the only predictors of defection intentions.

1.3.7 Hypothesis 7

As previously mentioned, callousness and impulsivity should both uniquely mediate the behavior of Dark Triad individuals (Jonason, Koenig, & Tost, 2010; Jones & Figuerdo, 2013; Jones & Paulhus, 2011; Miller et al., 2010). In order to test this relationship, I hypothesized that, in the prisoner's dilemma, callousness and impulsivity would mediate the relationship between the five Dark Triad components and defection intentions when outcomes are presented as potential gains. However, in

the chicken game, impulsivity would be a stronger predictor of defection intentions than callousness.

1.3.8 Controlling for the Effect of the COVID-19 Pandemic

The study was conducted at a time when external circumstances caused by the novel coronavirus (COVID-19) pandemic may have uniquely influenced individuals' decision making and behavior (Doerfler et al., 2021). In order to control for variance in responses attributed to the ongoing pandemic, I included a COVID-19 quality of life impact scale in the survey.

Chapter 2

Method

2.1 Participants and Procedure

An important consideration in social science research is the influence of statistical power in our ability to reduce Type II errors (false-negatives) and more accurately estimate effect sizes (Barnes et al., 2018). In order to determine the appropriate sample size for this study, a power analysis was conducted using G*Power software. Of the planned analyses for the current investigation, the largest minimum sample size for the current investigation was identified with the following conditions: a logistic regression analysis with a .05 alpha criterion, a .80 power criterion, and a minimum odds ratio of 2.35. The odds ratio of 2.35 was used as the effect size parameter based on the results of a framing effects meta-analysis (Kuhberger, 1998). The power analysis indicated that a minimum total sample size of 179 participants was required for sufficient power (Faul et al., 2009).

In total, 300 participants were recruited using Amazon Mechanical Turk (MTurk) in March 2021. MTurk was chosen due to its diverse participant pool and the higher reliability and accuracy of the data collected on the platform compared to student samples (Graham et al., 2020; Hauser & Schwarz, 2016). In order to participate in the current

study, participants were required to be at least 18 years old, to currently reside in the United States, to have completed over 50 previous tasks on MTurk, and to have a task approval rate of at least 95%.

Potential participants were told they would have to complete a survey and play a quick online game with another participant. Informed consent was obtained from all participants before they were prompted to complete the study. In order to control for ordering effects, participants were randomly assigned to play the game either before completing the survey or after completing the survey.

The survey included demographic questions (e.g., age, gender), personality scales, and a scale measuring the impact of COVID-19 on their quality of life. The personality scales included the following: the Narcissistic Personality Inventory (Ames et al., 2006), the Hypersensitive Narcissism Scale (Hendin & Cheek, 1997), the Levenson Self-Report Psychopathy Scale (Levenson et al., 1995), the Machiavellianism-IV Scale (Christie & Geis, 1970), the Barratt Impulsiveness Scale (Steinberg et al., 2013), and the Callous Affect dimension of the Hare Self-Report Psychopathy Scale (Paulhus et al., in press). Attention checks were placed throughout the survey (e.g., “What is the capital of France?”). If a participant failed one of the attention checks, they were dismissed from completing the remainder of the study.

2.2 Prisoner's Dilemma and Chicken Game

Before starting the game, participants were randomly assigned to one of four conditions based on a 2 (gain vs. loss framing) × 2 (normal- vs. high-risk condition) between-subjects design. Participants were told that they would be paired with and competing against another participant for points. These points were each worth the equivalent of one raffle entry for bonus payments of \$2 that were awarded to five participants. For the purpose of the present study, participants were not actually paired with another participant.³ Rather, after reading the game instructions and answering game comprehension questions, they were sent to a loading screen and were told they were being paired with another participant. After spending 10 seconds on the loading screen, participants chose between one of two options: option A (cooperation) or option B (defection). In order to reduce bias in participants' decision making, the words "cooperation" and "defection" were not used during the game; choices were instead referred to as "option A" and "option B." A payoff matrix was included in the instructions to show how many points they would potentially gain or lose as a result of the game outcome (see Appendix A).

³ Since participants did not play against an actual opponent, a random number generator was used to simulate the opposing players' decision for the purpose of determining raffle ticket entries.

The potential outcomes of the games differed for each condition. In the gain frame, participants were told potential outcomes in terms of points gained (e.g., “If you both choose option A, you will each earn 2 points”). In the loss frame, participants were told potential outcomes in terms of points lost (e.g., “If you both choose option A, you will each lose 1 point”). In addition, potential outcomes differed as a result of the risk (game) condition. In the prisoner’s dilemma game (i.e., normal-risk condition), the worst possible outcome occurs for the individual when they choose to cooperate and their partner chooses to defect (e.g., “If you choose option A and your partner chooses option B, you will lose 3 points and your partner will lose 0 points”). In contrast, in the chicken game (i.e., high-risk condition), the worst possible outcome for the individual occurs when both they and their partner defect (e.g., “If you both choose option B, you will both lose 3 points”).

After viewing the game instructions and payoff matrix, participants were asked to repeat the outcome of each of the four possible scenarios (i.e., both cooperate, both defect, participant cooperates and partner defects, and participant defects and partner cooperates) in order to ensure comprehension of the game. Participants were able to see the payoff matrix when responding to the comprehension check. After successfully completing the comprehension check, participants were asked to make

their decision between option A and option B. After making their decision, participants experienced a brief loading screen and were told they were being disconnected from the other participant. After completing the game, participants completed a brief cognitive arousal measure (Affect Grid; Russell et al., 1989) as a control. After completing the game, arousal measure, and the survey, participants were thanked and debriefed.

2.3 Measures

2.3.1 Narcissistic Personality Inventory

The 16-item Narcissism Personality Inventory (NPI-16; Ames et al., 2006) is a measure of trait grandiose narcissism. For each item, participants were given a pair of contrasting statements (e.g., “I try not to be a show-off,” “I am apt to show off if I get the chance”) and were asked to select the statement that best describes their thoughts and feelings. The NPI-16 consisted of eight reverse-keyed items that were reverse-coded prior to scale calculation. Higher scores indicate higher levels of trait grandiose narcissism.

2.3.2 Hypersensitive Narcissism Scale

The 10-item Hypersensitive Narcissism Scale (HSNS; Hendin & Cheek, 1997) is a measure of trait vulnerable narcissism. Participants rated their level of agreement with each statement (e.g., “I often interpret the remarks of others in a personal way”) on a Likert scale that ranged

from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate higher levels of vulnerable narcissism.

2.3.3 Levenson Self-Report Psychopathy Scale

The 26-item Levenson Self-Report Psychopathy Scale (LSRP; Levenson et al., 1995) measures both primary psychopathy (i.e., cold, manipulative) and secondary psychopathy (i.e., neurotic, impulsive). Participants rated their level of agreement with 16 items that measured primary psychopathy (e.g., “Success is based on survival of the fittest; I am not concerned about the losers”) and 10 items that measured secondary psychopathy (e.g., “I find myself in the same kinds of trouble, time after time”) on a Likert scale that ranged from 1 (*strongly disagree*) to 4 (*strongly agree*). The LSRP consisted of seven reverse-keyed items that were reverse-coded prior to scale calculation. Higher scores on the primary and secondary psychopathy dimensions indicate higher levels of those traits.

2.3.4 Machiavellianism Scale

The 20-item Machiavellianism-IV (Mach-IV) Scale (Christie & Geis, 1970) measures trait Machiavellianism. Participants rated their level of agreement with each statement (e.g., “The biggest difference between most criminals and other people is that criminals are stupid enough to get caught”) on a Likert scale that ranged from 1 (*strongly disagree*) to 7

(*strongly agree*). The Mach-IV consisted of 10 reverse-keyed items that were reverse-coded prior to scale calculation. Higher scores indicate higher levels of Machiavellianism.

2.3.5 Barratt Impulsiveness Scale

The 8-item Barratt Impulsiveness Scale-Brief (BIS-Brief; Steinberg et al., 2013) is a measure of trait impulsiveness. Participants rated their frequency of impulsive behaviors (e.g., “I act on the spur of the moment”) on a scale that ranged from 1 (*rarely/never*) to 4 (*almost always/always*). The BIS-Brief consisted of four reverse-keyed items that were reverse-coded prior to scale calculation. Higher scores indicate higher levels of trait impulsivity.

2.3.6 Callous Affect

The callous affect dimension of the Hare Self-Report Psychopathy Scale (SRP-III; Paulhus et al., in press) includes 16 items that measure low empathy and a lack of concern for others (e.g., “I sometimes dump friends that I don’t need any more”). Participants rated their level of agreement with each statement on a Likert scale that ranges from 1 (*strongly disagree*) to 5 (*strongly agree*). The dimension consisted of five reverse-keyed items that were reverse-coded prior to scale calculation. Higher scores indicate higher levels of trait callousness.

2.3.7 COVID-19-Impact on Quality-of-Life Scale

The six-item COVID-19-Impact on Quality-of-Life Scale (COV19-QoL; Repišti et al., 2020) is a measure of the effect of COVID-19 on an individual's quality of life. Participants rated their level of agreement in the past seven days with each statement (e.g., "Due to the spread of the Coronavirus I feel more tense than before") on a Likert scale that ranged from 1 (*completely disagree*) to 5 (*completely agree*). Higher scores indicate a higher impact on quality of life. The scale demonstrated decent reliability, $\alpha = .89$.

2.3.8 Affect Grid

The Affect Grid (Russell et al., 1989) measures both affect and arousal. Participants selected a square on a 9 x 9 grid that represented how they felt at the current moment (see Appendix B). Affect was scored using participants' x-axis square selection on a scale from 1 (*unpleasant feelings*) to 9 (*pleasant feelings*). Arousal was scored using participants' y-axis square selection on a scale from 1 (*sleepiness*) to 9 (*high arousal*). The Affect Grid has demonstrated moderate convergent validity with similar general dimensions of pleasure and arousal (Killgore, 1998).

Chapter 3

Results

3.1 Data Screening

The survey included two attention checks (“What is the capital of France?” and “If you are paying attention, please choose “strongly agree”). In addition, each version of the game included four comprehension questions. For each game comprehension question, if a participant missed the question, they were given a second opportunity to answer the question. Data from participants who failed any of the attention checks or who failed both attempts of a game’s comprehension question were excluded from hypotheses testing.

Of the 330 participants who completed the survey without failing an attention check or missing a game’s comprehension question twice, 27 were excluded prior to data analysis for various reasons: Thirteen participants whose location was outside the United States; seven participants who chose the same extreme value for all items on at least one reverse-keyed Likert-scale personality measure (e.g., selected “2” for all items on a 7-point scale); five participants who were flagged as outliers for high variance in values on at least one Likert-scale personality questions that were keyed in one direction (e.g., alternated between “1” and “5” on a 5-point scale with no reverse-keyed items); and two

participants who withdrew their consent at the end of the survey. Data from the remaining 303 participants ($M_{\text{age}} = 40.23$, $SD_{\text{age}} = 11.81$, age range: 20-71; 152 females and 149 males⁴) were used in subsequent analyses to test the hypotheses.

Assumptions of normality were tested for all personality measures in the final dataset. A few outliers emerged but were retained because they represented plausible values. An inspection of the histograms and Q-Q plots revealed that all personality variables demonstrated acceptable distributions, with the exception of the Mach-IV, which was negatively skewed. After a squared-transformation, the Mach-IV standardized skewness value was within an acceptable range (Tabachnick & Fidell, 2013). The transformed values for the Mach-IV were used for subsequent analyses. Pre-transformed descriptive statistics, zero-order correlations, and internal reliability estimates for all personality measured are included in Table 1.

⁴ When asked their gender, two participants chose not to respond or identified as something other than male or female.

Table 1

Correlation, Descriptive Statistics, and Internal Reliability Estimates of the Personality Variables

Variable	1	2	3	4	5	6	7
1. Grandiose Narcissism	--	.39	.65	.45	.39	.58	.16
2. Vulnerable Narcissism		--	.56	.70	.60	.58	.51
3. Primary Psychopathy			--	.72	.67	.77	.38
4. Secondary Psychopathy				--	.65	.76	.63
5. Machiavellianism					--	.65	.44
6. Callousness						--	.49
7. Impulsivity							--
Cronbach's α	.83	.85	.89	.85	.77	.85	.80
Overall: $M (SD)$.34 (.24)	29.93 (7.72)	33.63 (8.91)	21.08 (6.11)	3.48 (0.72)	2.46 (0.67)	1.79 (0.53)

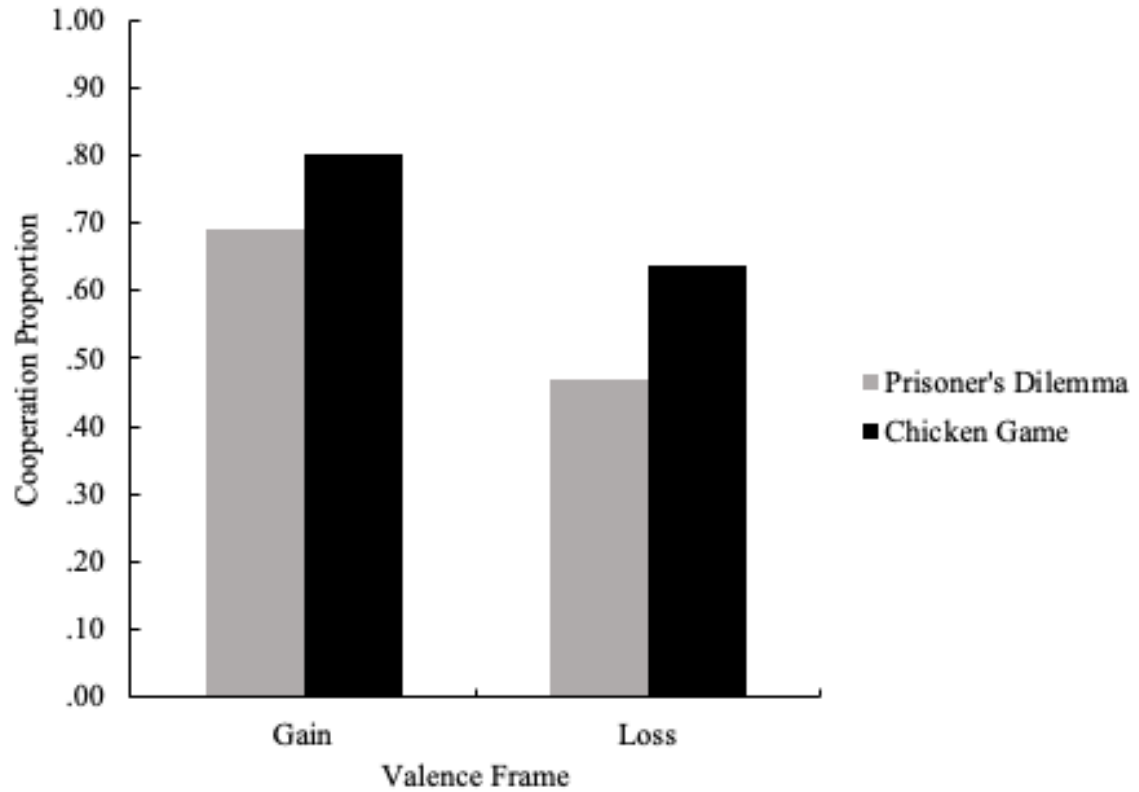
Note. All variables were correlated with one another at $p < .001$, with the exception of grandiose narcissism and impulsivity, which were correlated at $p = .006$. All variables in the table were assessed using their pre-transformed values.

3.2 Data Analysis

Data were analyzed using IBM SPSS 27. In the prisoner's dilemma, 69% of participants ($N = 54/78$) chose the cooperative option in the gain frame, whereas 47% of participants ($N = 38/81$) chose the cooperative option in the loss frame (see Figure 2). In the chicken game, 80% of participants ($N = 60/75$) chose the cooperative option in the gain frame, whereas 64% of participants ($N = 44/69$) chose the cooperative option in the loss frame.

Figure 2

Proportion of Participants Choosing to Cooperate Based on Game and on Valence Framing Condition



Note. The prisoner's dilemma represents a normal-risk condition whereas the chicken game represents a high-risk condition.

3.2.1 Examination of Potential Covariates

Several potential covariates were examined in relation to cooperation tendencies, including age, gender, the impact of COVID-19 on quality of life, cognitive arousal after completing the game, and the order of the study items (survey first vs. game first).

3.2.1.1 Age and Gender

A logistic regression analysis was conducted to measure the influence of age and gender on defection behavior. After controlling for the order of the study items and the two conditions (valence frame and risk), the overall regression model was significant, $-2LL = 364.89$, $X^2(5, N = 301) = 25.68$, $p < .001$, $R^2 = .08$ (Cox & Snell), $.11$ (Nagelkerke). However, the unique addition of age and gender to the model resulted in only marginally significant increased predictability of defection behavior, $X^2(2, N = 301) = 5.27$, $p = .07$. Upon further inspection, age was a significant predictor of defection behavior, $b = .02$, $SE = .01$, $Wald = 4.92$, $p = .03$, $Exp(B) = 1.03$. When applicable, age was controlled for during subsequent analyses testing the hypotheses. However, gender was not a predictor of defection behavior. Thus, gender was not controlled for during analyses testing the hypotheses.

3.2.1.2 COVID-19 Impact on Quality of Life

To assess the influence that the COVID-19 pandemic has had on decision making, a logistic regression analysis was conducted. However, after controlling for the order of the study items and the two conditions, the COVID-19-QoL measure was not a unique predictor of defection behavior. Thus, the COVID-19-QoL measure was not controlled for during analyses testing the hypotheses.

3.2.1.3 Cognitive Arousal

The influence of cognitive arousal on decision making was also assessed using a logistic regression analysis. However, after controlling for the order of the study items and for the framing and risk conditions, the arousal metric of the Affect Grid was not a unique predictor of defection behavior. Thus, cognitive arousal was not controlled for during analyses testing the hypotheses.

3.2.1.4 Survey Order

Study item order was counterbalanced so that participants were randomly assigned to complete the personality measures before playing the game or to play the game before completing the personality measures. A logistic regression analysis was conducted to determine if the study item order influenced decision making. After controlling for the two framing conditions, the unique addition of survey order did not improve the accuracy of the regression model, $X^2(1, N = 303) = 1.04, p = .31$. Thus, survey order was not controlled for in analyses testing the hypotheses.

3.2.2 *General Framing Effects*

In order to assess the unique influence of both valence and risk conditions, two regression models were used. In the first regression analysis, after controlling for risk, valence framing was a unique predictor of defection, $X^2(1, N = 303) = 12.90, p < .001$. The reverse was also true

in the second regression analysis: After controlling for valence framing, risk was a unique predictor of defection, $X^2(1, N = 303) = 6.60, p = .01$. In the shared models, valence condition ($b = 0.89, SE = 0.25, Wald = 12.52, p < .001, \text{Exp}(B) = 2.43$) accounted for more variance in defection behavior than did risk condition ($b = -0.64, SE = 0.25, Wald = 6.48, p = .01, \text{Exp}(B) = 0.53$).

3.2.3 Hypothesis 1

To test the hypothesis that individuals are more likely to defect when outcomes are presented as potential losses (as opposed to gains) in the prisoner's dilemma, a chi-square test of independence was used. The results supported the hypothesis, with 53% of individuals defecting in the loss frame and 31% defecting in the gain frame, $X^2(1, N = 159) = 8.12, p = .004, \phi = .23$. The finding remained after controlling for age in a logistic regression model, $X^2(1, N = 159) = 8.62, p = .003$.

3.2.4 Hypothesis 2

The first part of the second hypothesis was the prediction that individuals are more likely to defect when outcomes are presented as potential losses (as opposed to gains) in the chicken game. The results of a chi-square test of independence supported the first part of the hypothesis and replicated previous research (De Heus et al., 2010), with 36% of individuals defecting in the loss frame and 20% defecting in the

gain frame, $X^2(1, N = 144) = 4.72, p = .03, \phi = .18$. The finding remained after controlling for age in a logistic regression model, $X^2(1, N = 144) = 5.07, p = .02$.

The second part of the second hypothesis was the prediction that the effect of valence framing would be stronger in the chicken game than in the prisoner's dilemma. After controlling for age, and the main effects of valence framing and risk condition, the interaction between valence and risk was not significant (see Table 2). Notably, valence had a stronger effect in the prisoner's dilemma than expected, such that people scored higher in the gain frame of the prisoner's dilemma than anticipated. For a more specific comparison of effects between the two games, two chi-square tests of independence were conducted. As predicted, results of the first chi-square test showed that participants were more likely to defect in the prisoner's dilemma compared to the chicken game in the loss frame, $X^2(1, N = 150) = 4.27, p = .04, \phi = -.12$. However, in the gain frame, results of the second chi-square test showed that there was no difference in decisions to defect between the prisoner's dilemma and the chicken game, $X^2(1, N = 153) = 2.34, p = .13$. In two logistic regression models, each controlling for age, the unique effects of risk remained the same for both the loss frame ($X^2(1, N = 150) = 4.28, p = .04$) and the gain frame ($X^2(1, N = 153) = 2.37, p = .12$). Notably, age was a significant predictor of

defection in the gain frame ($X^2(1, N = 153) = 8.21, p = .004$) but not the loss frame ($X^2(1, N = 150) = 0.63, p = .43$).

Table 2

Hierarchical Logistic Regression Analysis of Effects of Valence Frame and Risk Condition, The Dark Triad Traits, and Their Interactions on Cooperation Behavior After Controlling for Age

Predictor	<i>b</i>	<i>SE</i>	Wald	Exp(<i>B</i>)	-2 <i>LL</i>	Model chi-square	Cox & Snell <i>R</i> square	Nagelkerke <i>R</i> square
Step 1					388.02	5.50*	.02	.03
Age	0.02	0.01	5.47*	1.02				
Step 2					367.53	25.99***	.08	.11
Valence	0.92	0.25	13.18***	2.52				
Risk	-0.65	0.25	6.46*	0.52				
Step 3					367.47	26.04***	.08	.11
Valence x risk	-0.12	0.51	0.05					
Step 4					366.84	26.68**	.08	.12
GN	-0.07	0.69	0.01					
VN	-0.01	0.02	0.14					
PP	0.01	0.03	0.21					
SP	-0.01	0.04	0.13					
Mach	0.01	0.04	0.13					
Step 5					340.36	53.16***	.16	.22
GN x valence	3.93	1.57	6.25*	51.01				
VN x valence	-0.14	0.05	7.26**	0.87				
PP x valence	0.001	0.06	0.001					

SP x valence	0.07	0.08	0.71		
Mach x valence	0.06	0.09	0.41		
GN x risk	3.35	1.57	4.55*	28.42	
VN x risk	-0.07	0.05	1.67		
PP x risk	-0.04	0.06	0.55		
SP x risk	-0.08	0.08	0.99		
Mach x risk	0.12	0.09	5.39*	1.22	
Step 6				336.37	57.14***
GN x valence x risk	-4.28	3.32	1.66		.17
VN x valence x risk	0.06	0.11	0.28		.24
PP x valence x risk	0.09	0.11	0.62		
SP x valence x risk	-0.04	0.16	0.05		
Mach x valence x risk	0.13	0.18	0.51		

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. GN = grandiose narcissism; VN = vulnerable narcissism; PP = primary psychopathy; SP = secondary psychopathy; Mach = Machiavellianism. In order to compute interaction effects, continuous predictors were mean-centered, and valence (-.5 = gain; .5 = loss) and risk/game (-.5 = normal; .5 = high) were re-coded.

3.2.5 Hypothesis 3

The third hypothesis consisted of three predictions. The first prediction was that all five of the Dark Triad trait components (grandiose narcissism, vulnerable narcissism, primary psychopathy, secondary

psychopathy, and Machiavellianism)⁵ would each be positively correlated with both callousness and impulsivity. This prediction was supported, and the zero-order correlations among all seven variables are provided in Table 1.

The second prediction was that, after controlling for the shared variance among the five components, Machiavellianism, primary psychopathy, and grandiose narcissism would be the only predictors of callousness. This prediction was tested via a multiple linear regression analysis; results are provided in Table 3. As predicted, grandiose narcissism, primary psychopathy, and Machiavellianism each accounted for unique variance in the model. However, secondary psychopathy also emerged as a unique predictor of callousness. The five Dark Triad components together accounted for 70% of the variance in the callousness measure. However, the individual effect sizes for each Dark Triad trait were weak in comparison. This difference between the individual predictors and the overall model accuracy suggests that the Dark Triad traits share a substantial amount of shared variance in predicting callousness.

⁵ The five scales did not violate multicollinearity assumptions when using a conservative variance inflation factor cutoff of 5.00 (Sheather, 2009).

Table 3

Results of the Multiple Regression Analyses for the Prediction of Callousness and Impulsivity

Variable	β	t	sr^2	R^2	F
Callousness				.70	140.87***
Grandiose Narcissism	.15	3.67***	.01		
Vulnerable Narcissism	.01	0.15			
Primary Psychopathy	.30	5.23***	.03		
Secondary Psychopathy	.40	7.48***	.06		
Machiavellianism	.12	2.67**	.01		
Impulsiveness				.43	44.97***
Grandiose Narcissism	-.14	-2.46*	.01		
Vulnerable Narcissism	.15	2.37*	.01		
Primary Psychopathy	-.08	-1.03			
Secondary Psychopathy	.62	8.31***	.13		
Machiavellianism	.05	0.77			

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

The third prediction was that, after controlling for the shared variance among the five components, secondary psychopathy and vulnerable narcissism would be the only predictors of impulsiveness. This prediction was also tested via a multiple linear regression analysis (see Table 3). The five Dark Triad components together accounted for 43% of the variance in the impulsiveness measure. As predicted, vulnerable

narcissism and secondary psychopathy were the only unique predictors of increased impulsiveness in the model. Notably, grandiose narcissism emerged as a *negative* predictor of impulsiveness in the model, despite the positive zero-order correlation between the two variables. This finding suggests that, after controlling for the shared variance among the Dark Triad traits, the aspects of grandiose narcissism that make it unique include decreased levels of impulsiveness.

3.2.6 Hypothesis 4

The fourth hypothesis consisted of two predictions. The first prediction was that, after controlling for framing and risk conditions, the five Dark Triad components would predict defection behavior. A logistic regression was conducted to test this hypothesis. After controlling for participant age and both the risk condition and valence framing, the five Dark Triad components did not significantly improve the model accuracy (see Table 2).

The second prediction was that, after controlling for framing and risk, callousness, impulsiveness, and their interaction would predict defection behavior. A logistic regression was conducted to test this hypothesis. Prior to analysis, both callousness and impulsivity were centered on their mean, and the product of the two mean-centered variables was used as the interaction predictor. After controlling for

participant age and for both risk and valence framing, the overall logistic regression model was significant, $-2LL = 364.81$, $X^2(6, N = 303) = 28.71$, $p < .001$, $R^2 = .09$ (Cox & Snell) $.12$ (Nagelkerke). However, the addition of callousness, impulsiveness, and their interaction did not improve the model accuracy, $X^2(3, N = 303) = 2.72$, $p = .44$. Therefore, the results did not support either of the two predictions made by the fourth hypothesis.

3.2.7 Hypothesis 5

It was predicted that the five Dark Triad components would differently relate to defection in the gain frame as compared to the loss frame of the chicken game. Relevant to the current hypothesis, results of the combined logistic regression model in Table 2 show that that both grandiose and vulnerable narcissism interacted with valence frame, and that both grandiose narcissism and Machiavellianism interacted with risk condition to predict defection.⁶ In the current hypothesis, it was specifically predicted that the five Dark Triad components would predict defection in the gain frame of the prisoner's dilemma. This simple effect prediction was

⁶ Results of the combined regression model indicated that grandiose narcissism predicted higher rates of defection in the gain frames in comparison to the loss frames, whereas vulnerable narcissism predicted lower rates of defection in the gain frames in comparison to the loss frames. In addition, grandiose narcissism and Machiavellianism predicted higher rates of defection in the prisoner's dilemma (normal risk) in comparison to the chicken game (high risk).

tested using the prisoner's dilemma data in a logistic regression model, with the five Dark Triad components being entered into the model after controlling for age. The overall logistic regression model was significant, $-2LL = 79.36$, $X^2(6, N = 78) = 16.93$, $p = .01$, $R^2 = .20$ (Cox & Snell) .28 (Nagelkerke). The five Dark Triad components together improved the model accuracy, $X^2(5, N = 78) = 14.60$, $p = .01$. Specifically, vulnerable narcissism predicted increased defection ($b = 0.13$, $SE = 0.06$, Wald = 5.57, $p = .02$, $\text{Exp}(B) = 1.14$), whereas grandiose narcissism predicted decreased defection ($b = -5.72$, $SE = 2.03$, Wald = 7.98, $p = .005$, $\text{Exp}(B) = 0.003$).

The second prediction was that, in the loss frame of the prisoner's dilemma, the five Dark Triad components would not predict defection. This prediction was also tested using the prisoner's dilemma data in a logistic regression model, with the five Dark Triad components being entered in the model after controlling for age. The overall logistic regression model was not significant, $-2LL = 79.36$, $X^2(6, N = 81) = 4.15$, $p = .66$. In addition, as predicted, the five Dark Triad components did not improve the model accuracy, $X^2(5, N = 81) = 2.87$, $p = .72$. Overall, results partially supported the predictions made in the fifth hypothesis.

3.2.8 Hypothesis 6

It was predicted that the five Dark Triad components would differently relate to defection in the chicken game as a result of valence framing and the differences between the callous and impulsive aspects of the Dark Triad. As discussed in the fifth hypothesis, and relevant to the current hypothesis, results of the combined logistic regression model in Table 2 show that both grandiose and vulnerable narcissism interacted with valence frame and that both grandiose narcissism and Machiavellianism interacted with risk condition to predict defection. In regard to risk condition (prisoner's dilemma v. chicken game), grandiose narcissism and Machiavellianism each predicted higher rates of defection in the normal-risk condition (prisoner's dilemma) as compared to the high-risk condition (chicken game).

In the current hypothesis, it was specifically predicted that the impulsive aspects of the Dark Triad (i.e., vulnerable narcissism and secondary psychopathy) would uniquely predict defection in the gain frame of the chicken game. It was also predicted that, under the same conditions but in a separate model, impulsivity would also uniquely predict defection. Both predictions were tested using the chicken game data in logistic regression models, controlling for age. The step which included the five Dark Triad components did not improve the model accuracy, $X^2(3, N$

= 75) = 1.62, $p = .66$. Similarly, in the second model, the step which included impulsivity, callousness, and their interaction did not improve the model accuracy, $X^2(5, N = 75) = 1.67, p = .89$. Therefore, the results did not support either of the two simple effects predictions made by the fourth hypothesis.

3.2.9 Hypothesis 7

It was predicted that impulsivity and callousness would mediate the relationship between the Dark Triad traits and defection. However, one of several assumptions that must be met in order to conduct a mediation model is that the mediator be significantly related to the dependent variable after controlling for the independent variables (Baron & Kenny, 1986; Fritz & MacKinnon, 2007). Results from the fourth hypothesis had demonstrated that the proposed mediators (callousness, impulsiveness, and their interaction) were not directly related to the dependent variable (defection). In addition, after controlling for age, the risk and framing conditions, the five Dark Triad components, and the interactions between the risk and framing conditions and each of the Dark Triad components, the proposed mediators were still not significant predictors of defection, $X^2(3, N = 303) = 4.73, p = .19$. Therefore, the assumptions required to conduct the mediation analysis were not met, so the analysis testing this hypothesis was not conducted.

3.2.10 Exploratory Analysis

It is possible, due to the length and complexity of the study, that there were individual differences between those that completed the study and those that did not complete the study. Previous research has shown that individuals who score lower on measures of conventional morality are less likely to complete a study (Tooke & Ickes, 1988). To assess whether there was a relationship between survey completion and the five Dark Triad components, exploratory point-biserial correlation analyses were conducted between the Dark Triad variables and two groups—those who completed ($N = 173$) and those who did not complete the study ($N = 189$)—in the survey-first version of the study.⁷ Results indicated that higher levels of the Dark Triad traits were associated with not completing the study (see Table 4).

⁷ Participants who quit or failed attention/comprehension checks were together counted as did not complete. Survey completion was coded as 0 (did not complete) or 1 (completed). Cronbach's alphas for the five Dark Triad components in the non-completion group ranged from .69-.89.

Table 4

Point-biserial Correlations Between the Dark Triad Variables and Study Completion, and Descriptive Statistics of the Dark Triad Variables for the Non-completion Group

Variable	Completion (r_{pb})	M	SD
Grandiose Narcissism	-.37	.50	.23
Vulnerable Narcissism	-.29	34.82	8.25
Primary Psychopathy	-.39	40.16	6.75
Secondary Psychopathy	-.39	26.17	5.60
Machiavellianism	-.27	3.80	0.50

Note. All Dark Triad variables were correlated with completion at $p < .001$.

Chapter 4

Discussion

The decision to cooperate (or not) with others can have lasting impacts on interpersonal relationships. In the case of Cuban Missile Crisis, the decision to cooperate by both the United States and the Soviet Union led to reduced tensions between the two nations. Although the effects of context on cooperative behavior have been well observed (e.g., De Haus et al., 2010; Goerg et al., 2017; McCusker & Carnevale, 1995), less is known about how socially undesirable traits influence the relationship between context and cooperation. In order to address this gap in the literature, the current study aimed to better understand the relationship between the Dark Triad personality traits, risk condition, and framing effects (valence) in regard to cooperative behavior. Findings of the current study are discussed, along with the study's strengths, the limitations, and future directions of research.

4.1 Framing Effects

The influence of framing on decision-making has been well studied. Valence framing tends to affect decision making such that people are more likely to take risks when scenarios are framed as losses, and less likely to take risks when scenarios are framed as gains (Kahneman & Tversky, 1979; Kuhberger, 1998). When risks are less apparent, people

tend to choose options that are more cooperative when outcomes are framed as gains and options that are more selfish when outcomes are framed as losses (Deutchman & Sullivan, 2018; McCusker & Carnevale, 1995). Results from the current investigation are consistent with these findings.

In the prisoner's dilemma game, risk was not apparent—or was at least less apparent than in the chicken game. Regardless of valence frame, the most self-maximizing option in the game is the defection option, since defection would lead to higher potential gains in comparison to the cooperation option. As expected, people were more likely to cooperate in the gain frame of the prisoner's dilemma than in the loss frame. This finding replicates previous research, demonstrating that people are typically inclined to cooperate when there are net gains involved (Deutchman & Sullivan, 2018; McCusker & Carnevale, 1995).

In the chicken game, risk was more apparent. By using the chicken game, we are able to apply predictions made by prospect theory (Kahneman & Tversky, 1979), namely that people are risk-seeking when outcomes are framed in terms of potential losses and risk-averse when outcomes are framed in terms of potential gains. Results of the current investigation support these predictions. Participants were more risk-averse

(chose the cooperative option) in the gain frame of the chicken game compared to the loss frame.

In addition to the effects of valence framing within both games, there was a main effect of game type (risk condition) on cooperation tendencies. Consistent with predictions and with previous research (De Heus et al., 2010), participants were more likely to cooperate in the chicken game than in the prisoner's dilemma game, suggesting that, when risk is greater, people are more likely to choose the safer, less risky option.

In addition to the main effects, it was also expected that there would be an interaction between valence framing and risk condition. Specifically, it was predicted that the effect of valence would be stronger in the chicken game than in the prisoner's dilemma. However, valence framing had a stronger effect in the prisoner's dilemma than in the chicken game, indicating that the effects of valence framing in the absence of risk was stronger than expected. This finding could be the result of differing characteristics of this sample⁸ compared to the sample in a recent study

⁸ Notably, in the current study, participants were more likely to cooperate in the gain frame of the prisoner's dilemma than in a recent study by De Heus and colleagues (2010). However, in the current investigation, individual differences were observed between those that completed and did not complete the study. Specifically, higher levels of Dark Triad traits were correlated with not finishing the study. In contrast to the current investigation, the De Heus et al. study was conducted in person using a student population. One caveat of MTurk studies is that participants have several studies available and can be more selective in which studies they want to complete.

(c.f., De Heus et al., 2010), or could indicate that the effect of valence framing on cooperation tendencies in the absence of risks is stronger than previously thought to be.

4.2 The Dark Triad

The Dark Triad traits were chosen for the current investigation to model the relationship between socially undesirable traits and cooperation tendencies. On the whole, the Dark Triad traits are associated with an approach to life that is uncooperative, risk-seeking, and self-maximizing (Jonason, Koenig, & Tost, 2010; Paulhus & Williams, 2002). It was expected that the five components that make up the Dark Triad—grandiose narcissism, vulnerable narcissism, primary psychopathy, secondary psychopathy, and Machiavellianism—would uncover nuances in the relationship between the Dark Triad traits in regard to impulsiveness and callousness and in regard to defection intentions in relation to framing conditions.

4.2.1 The Unique Influence of the Dark Triad Traits on Impulsivity and Callousness

It was expected that all five of the Dark Triad components would be correlated with increased callousness and impulsivity. Data from the current investigation supported this prediction. It was further predicted that, when combined in a regression model, the Dark Triad components

would be differently related to callousness and impulsivity. Specifically, it was predicted that grandiose narcissism, primary psychopathy, and Machiavellianism would be the only unique predictors of increased callousness, whereas vulnerable narcissism and secondary psychopathy would be the only unique predictors of increased impulsiveness.

In a combined regression model, grandiose narcissism, primary psychopathy, and Machiavellianism did uniquely predict callousness. However, secondary psychopathy also emerged as a unique predictor of callousness in the model. Although this unique relationship was not predicted, it is a reasonable finding. Compared to primary psychopathy, secondary psychopathy is related to the more hot-headed and risk-seeking aspects of psychopathy and callousness (Levenson et al., 1995). Those aspects of secondary psychopathy and callousness may have been what were observed in their unique relationship above and beyond the relationship between the other Dark Triad components and callousness.

In another combined regression model, as expected, vulnerable narcissism and secondary psychopathy emerged as the only unique predictors of increased impulsiveness. Perhaps a more interesting finding was the relationship between grandiose narcissism and impulsiveness in the combined model. In the zero-order correlation analysis, grandiose narcissism was correlated with increased impulsiveness; however, in the

combined model regression model, grandiose narcissism emerged as a significant predictor of *decreased* impulsiveness. Although this finding may seem counterintuitive at first, it makes sense when compared to previous research and when considering the aspects of grandiose narcissism that make it different than the other Dark Triad components, namely the adaptive aspects of grandiose narcissism (Doerfler et al., in press; Ackerman et al., 2011).

In a recent study, Doerfler and colleagues (in press) identified a negative correlation between grandiose narcissism and both a strong sense of self and an increased self-concept clarity. However, when combined with the other four Dark Triad components, grandiose narcissism emerged as a positive predictor of a strong sense of self and increased self-concept clarity. Notably, they found that this change in directionality was a result of the differences between the three facets of grandiose narcissism: entitlement/exploitativeness, grandiose exhibitionism, and leadership/authority (Ackerman et al., 2011). Specifically, the leadership/authority facet of grandiose narcissism was the unique predictor of increased sense of self and self-concept clarity, whereas the grandiose exhibitionism and entitlement/exploitativeness facets of grandiose narcissism predicted a weak sense of self and decreased self-concept clarity.

In the context of the present study, it is possible that the leadership/authority facet of grandiose narcissism was differently associated with impulsivity than were the grandiose exhibitionism and entitlement/exploitativeness facets. Indeed, leadership/authority is generally related to adaptive outcomes, whereas grandiose exhibitionism and entitlement/exploitativeness are generally related to maladaptive outcomes (Ackerman et al., 2010). In this case, grandiose exhibitionism and entitlement/exploitativeness were likely related to increased impulsivity, and the two facets shared substantial variance in predicting impulsivity with the other Dark Triad components.

4.2.2 The Relationship Between the Dark Triad Traits and Cooperation Tendencies

It was expected that the Dark Triad traits would be related to increased defection after controlling for both risk and valence framing. This prediction was made because individuals with higher levels of Dark Triad traits are more likely than others to behave selfishly (Book et al., 2016). However, after controlling for age and both risk and valence framing, the five Dark Triad components did not predict increased defection. In addition, callousness, impulsivity, and their interaction did not predict increased defection when substituted in place of the five Dark Triad components in the model.

However, after examining the interaction between the valence framing and risk conditions and the Dark Triad traits, differences in defection tendencies did emerge. Specifically, in the gain frame of the prisoner's dilemma, vulnerable narcissism predicted higher rates of defection, whereas grandiose narcissism predicted higher rates of cooperation. This finding may be attributed to the differences between grandiose and vulnerable narcissism. Both grandiose and vulnerable narcissism are related to self-enhancement strategies. However, there are differences in the interpersonal strategies between grandiose and vulnerable narcissists. Grandiose narcissists are concerned with being admired by others and want to be treated as exceptional. In order to accomplish their goal of being well-received by others, grandiose narcissists go out of their way to make a good first impression on others. In contrast, vulnerable narcissists are more neurotic and hostile, and will insist on having things their way from the start.

Notably, the relationship between the two types of narcissism and cooperation tendencies observed in the current investigation is similar to the findings of another study. In an iterated prisoner's dilemma game, Malesza (2020b) found that grandiose narcissism predicted higher rates of cooperation and vulnerable narcissism predicted higher rates of defection in the first round of the game. However, after several rounds had passed,

grandiose narcissism was increasingly related to defection. The current investigation adds to these findings in three ways. First, the current investigation demonstrated that grandiose narcissists are still more likely to choose the cooperative option when there is only one round in the prisoner's dilemma, meaning that grandiose narcissists likely want to form a good impression even when they know they will never encounter their opponent again and they have no chance to retaliate against the other person's decision. Second, the current investigation also compared valence framing conditions. The relationship between the two types of narcissism and cooperation was only observed in the gain frame, not in the loss frame. This finding is unsurprising, because people were expected to be less cooperative in the loss frame than in the gain frame, thereby overshadowing any effect the Dark Triad traits would have on defection intentions. Finally, the current investigation included a risk condition. When risks were high (i.e., the chicken game), grandiose narcissism predicted lower rates of defection. This finding suggests that grandiose narcissists are adept at evaluating the impacts of risk on outcomes.

It was additionally expected that the Dark Triad traits would be related to higher rates of defection in the gain frame of the chicken game (high-risk condition). Specifically, it was predicted that the more impulsive

Dark Triad components (vulnerable narcissism and secondary psychopathy), and impulsiveness itself, would uniquely predict increased risk-seeking (defection) in the gain frame of the high-risk condition (chicken game). This hypothesis was made, in part, due to recent theoretical predictions regarding the relationship that callousness and impulsiveness have on decision making under various levels of risk (Miller et al., 2010; Reyna & Panagiotopoulos, in press). However, results of the current study do not support this hypothesis.⁹ One potential reason why this hypothesis was not supported is the imperfect relationship between impulsivity and risk-seeking behavior. For instance, although impulsivity is related to increased risk-seeking behavior, the relationship between the two may be better explained by impatience and a lack of consequential thinking rather than reward appraisal (Hamilton et al., 2014; Lyons, 2019).

Notably, two Dark Triad components that were not uniquely related to increased impulsivity—grandiose narcissism and Machiavellianism—each interacted with risk condition. In particular, grandiose narcissism and Machiavellianism both predicted higher rates of defection in the normal-risk condition (prisoner’s dilemma) in comparison to the high-risk condition

⁹ Notably, in support of fuzzy-trace theory predictions and recent findings regarding the Dark Triad and valence framing effects (Carre & Jones, 2017; Doerfler et al., 2021; Reyna & Panagiotopoulos, in press), psychopathy and Machiavellianism did not interact directly with valence framing conditions (see Table 2).

(chicken game). This finding was not surprising, because the more callous and less impulsive aspects of the Dark Triad are known to be related to higher evaluation of risk in decision making (Bereczkei & Czibor, 2014; Christie & Geis, 1970). In other words, individuals high on these traits carefully weigh out their options and choose the options that will maximize their potential for gain.

Psychopathy and Machiavellianism did not interact directly with valence framing conditions (see Table 2). This result, in combination with the finding that Machiavellians, but not psychopaths, are more likely to cooperate in high-risk conditions is interesting because it supports recent fuzzy-trace theory predictions and recent findings regarding the relationship between the Dark Triad traits and both risk and valence framing effects (Carre & Jones, 2017; Doerfler et al., 2021; Reyna & Panagiotopoulos, in press). Specifically, it is thought that psychopaths are verbatim thinkers and are not influenced by valence framing, whereas Machiavellians are gist-thinkers, but with a bias towards selfish and immoral values. The combination of findings from the current investigation supports these specific fuzzy-trace predictions and offers additional evidence that Machiavellians and psychopaths are differently related to decision-making (c.f., McHoskey et al., 1998).

4.2.3 The Relationship Between the Dark Triad Traits and Study

Completion

There could be any number of reasons as to why the Dark Triad traits, impulsivity and callousness, and their interactions with risk and valence framing did not predict defection entirely as expected. One likely explanation is attrition bias. Participants who completed the study were inherently different from those who did not complete the study in regard to levels of Dark Triad traits. Specifically, individuals with higher levels of Dark Triad traits were less likely to complete the study than those with lower levels of Dark Triad traits. This means the distribution of Dark Triad scores in the current study may have had a low ceiling.

In the MTurk platform, potential study participants have a large selection of potential tasks that they can complete, with varying levels of required effort, number of questions or tasks, and payment amounts. One strategy for self-maximization as a MTurk worker is to complete as many high-paying tasks in the shortest time possible. Those with higher levels of Dark Triad traits are more likely to engage in these self-maximizing strategies due to their callousness and impulsivity. Specifically, the callous aspects of the Dark Triad make individuals with these traits more strategic and opportunistic (Bereczkei & Czibor, 2014; Book et al., 2016; Christie & Geis, 1970), making them more likely to want to engage in studies that

pay more. This can also translate to a lower likelihood of completing studies (Tooke & Ickes, 1988).

In addition, impulsivity is also related to the tendency to give up easily because of boredom, fatigue, or task difficulty (Miller et al., 2010; Whiteside & Lynam, 2001). This could mean that individuals with higher levels of Dark Triad traits end up failing comprehension checks more often for tasks that require higher cognitive load. Notably, most online research on the Dark Triad is conducted via monolithic methods—namely, self-report measures—which requires less cognitive load (Miller et al., 2019). In the case of the current study, participants had to complete a task (the game) and memorize the rules of the task, which requires higher cognitive load.

Furthermore, the online nature of the study could have impacted the behavior of individuals with Dark Triad traits who did complete the study. Specifically, behavioral effects (i.e., cooperation vs. defection) that would otherwise be present in the real-world behavior of those with higher levels of Dark Triad traits may have been attenuated in the online study. For instance, Machiavellians tend to rely on situational information when making decisions (Bereczkei et al., 2015; Christie & Geis, 1970). In an online, one-shot game, Machiavellians had no information about their opponent to consider when making their decision. Moreover, there is the

possibility that participants knew they were not playing against another player. If participants held this belief during the game, it is possible they may have chosen one of the two options (cooperate or defect) without considering the mental processes of an opponent.

4.3 Strengths, Limitations, and Future Research

The present investigation has a number of notable strengths. First, I examined the relationship between the Dark Triad traits and cooperation tendencies under both valence framing and risk conditions. Using this methodology, the current study was among the first to test recent theoretical assumptions regarding Dark Triad traits and decision making in light of the fuzzy-trace theory (Carre & Jones, 2017; Reyna & Brainerd, 1995; Reyna & Panagiotopoulos, in press). Second, in support of recent efforts to measure the Dark Triad traits using measures that account for the various nuances in the Dark Triad (Doerfler et al., in press; Miller et al., 2010; Miller et al., 2019), the current study included measures of all five of the Dark Triad components. In doing so, I was able to uncover novel insights regarding the Dark Triad components in relation to impulsivity and callousness and regarding framing effects on cooperation tendencies.

Third, the current study included a behavioral measure (non-zero-sum games), which is somewhat uncommon, with recent estimates indicating that 80% of Dark Triad research is conducted exclusively with

self-report measures (Miller et al., 2019). The inclusion of a behavioral method in the current study adds to the generalizability of the findings. Fourth, I replicated findings regarding the main effects of risk and valence framing on cooperation tendencies that have been previously observed in in-person studies with students (De Haus et al., 2010), and extended these findings to an online population (MTurk) with a broader demographic. This extension is important because student samples are heavily relied on in Dark Triad research¹⁰, despite the repeated findings that Dark Triad traits are not consistent over age (Barlett, 2016; Doerfler et al., in press; Kawamoto et al., 2020). Therefore, the use of an online population in the current study further adds to the generalizability of the findings.

Finally, the order of the study design was counterbalanced so that half of the participants completed the survey items before completing the game, and the other half completed the game before completing the survey items. The results of the current study indicated that the order of items did not influence participants' decision to cooperate or defect. This finding contributes to our understanding of the relationship between personality scales and behavioral variables in regard to study design.

¹⁰ An estimated 53% of Dark Triad research is conducted exclusively with adolescent or undergraduate samples (Miller et al., 2019).

There were also some notable limitations in the current investigation. First and foremost, individuals with higher levels of Dark Triad traits were less likely to complete the study. Notably, personality traits have been linked to study attrition in previous research (Hansson et al., 2018; Tooke & Ickes, 1988). This is of particular concern regarding Dark Triad research, as individuals with these traits are more likely to engage in self-maximizing strategies, which could lead to higher attrition rates for these individuals. This could have resulted in skewed data, with an underrepresentation of Dark Triad traits in the sample population, which could limit the generalizability of these findings. Future research should identify strategies that incentivize individuals with higher levels of Dark Triad traits to complete online studies. Another potential strategy is to allow those who fail attention checks to still complete studies, and then to present both the findings for only those who passed all attention checks and the findings of the entire participant pool.

Second, participants were not actually paired with another player. Some participants may have realized this, which could have altered their decision to cooperate or defect. In order to make the game more realistic, future research is encouraged to either pair participants with one another or with a confederate in a lab setting. Third, the measure of cooperation was limited to a one-shot game. A natural progression of this work is to

analyze the effects of Dark Triad traits and framing on cooperation using an iterated game design. Iterated game designs introduce the possibility of strategic planning and retaliation, which may reveal more behavioral distinctions among the Dark Triad traits.

Finally, there could be any number of reasons why participants chose one option over the other (i.e., cooperate vs. defect). For instance, some participants may have been more focused on completing the study quickly rather than on carefully understanding the potential implications of the two options. Additionally, some participants may have found the decision to cooperate or defect easier than the other. To address these concerns, future studies should measure cooperative behavior on a continuous scale, using differing levels of cooperation. The use of a continuous dependent variable would introduce a middle ground for those who are undecided between or unconcerned with the differences between cooperation and defection. Moreover, in regard to the Dark Triad traits, a continuous dependent variable would allow researchers the opportunity to explore potential non-logarithmic relationships (e.g., linear, exponential) between the traits and behavior.

Chapter 5

Conclusions

The current investigation combined personality and cognitive theories to understand the relationship between the Dark Triad traits and cooperative behavior under different framing and risk conditions. Results of the current study replicated and expanded on both recent and well-established findings in previous research. First, results replicated findings regarding the main effects of both valence framing and risk on cooperative behavior using an online adult sample (De Heus et al., 2010). Second, nuances regarding the relationship between grandiose narcissism and impulsivity mirrored that of recent findings relating grandiose narcissism to a weak sense of self (Doerfler et al., in press). Third, this study did not uncover a significant main effect of Dark Triad traits on cooperation. However, the results did partially support recent theoretical predictions and empirical findings regarding the relationship between the Dark Triad traits and decision making as a result of framing effects under fuzzy-trace theory (Carre & Jones, 2017; Doerfler et al., 2021; Doerfler & Kaiser, 2021; Reyna & Panagiotopoulos, in press). Fourth, the order of the study items (survey first vs. game first) did not influence participants' decision to cooperate or defect. Finally, there was a negative relationship between the Dark Triad traits and study completion. Future studies are encouraged to

explore new creative strategies to measure the behavior of individuals with Dark Triad traits that can reduce attrition and maximize external validity.

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Appendix A

Prisoner's Dilemma Game Design

Gain Condition Instructions:

You are going to play a game with another player. You will play for points, and each point represents a lottery ticket. How many points you will win will be determined not only by your own choice, but also by the choice of the other person. At the same time, his or her points are also partly determined by your choices. You will each start with no points and will gain points based on the decisions made by you and the other person.

The game will be played as follows. You will have to make a choice between two possibilities, called A and B (the other person will have to also choose between A and B). At the moment you make your choice, you do not know the choice of the other person, and the other person does not know your choice. The number of points that each of you wins is determined by the combination of the choice made by you and the other person. As you can see in the figure below, there are four possible outcomes.

If you both choose Option A, you will each earn ## points. If you both choose Option B, you will each earn ## points. If you pick B and the other player picks A, you will earn ## points and the other player will earn ##. However, if you pick A and the other player picks B, you will earn ## and the other player will earn ##.

Loss Condition Instructions:

You are going to play a game with another player. You will play for points, and each point represents a lottery ticket. How many points you will lose will be determined not only by your own choice, but also by the choice of the other person. At the same time, his or her points are also partly determined by your choices. You will each start with 3 points and will lose points based on the decisions made by you and the other person.

The game will be played as follows. You will have to make a choice between two possibilities, called A and B (the other person will have to also choose between A and B). At the moment you make your choice, you do not know the choice of the other person, and the other person does not know your choice. The number of points that each of you loses is determined by the combination of the choice made by you and the other person. As you can see in the figure below, there are four possible outcomes.

If you both choose Option A, you will each lose ## points. If you both choose Option B, you will each lose ## points. If you pick B and the other player picks A, you will lose ## points and the other player will lose ##. However, if you pick A and the other player picks B, you will lose ## and the other player will lose ##.

Gain Frame

Prisoner's Dilemma

		Other Player's Decision	
		A	B
Your Decision	A	2 / 2	3 / 0
	B	0 / 3	1 / 1

Chicken Game

		Other Player's Decision	
		A	B
Your Decision	A	2 / 2	3 / 1
	B	1 / 3	0 / 0

Loss Frame

Other Player's Decision

		A	B
		A	-1 / -1
Your Decision	B	-3 / 0	-2 / -2

Other Player's Decision

		A	B
		A	-1 / -1
Your Decision	B	-2 / 0	-3 / -3

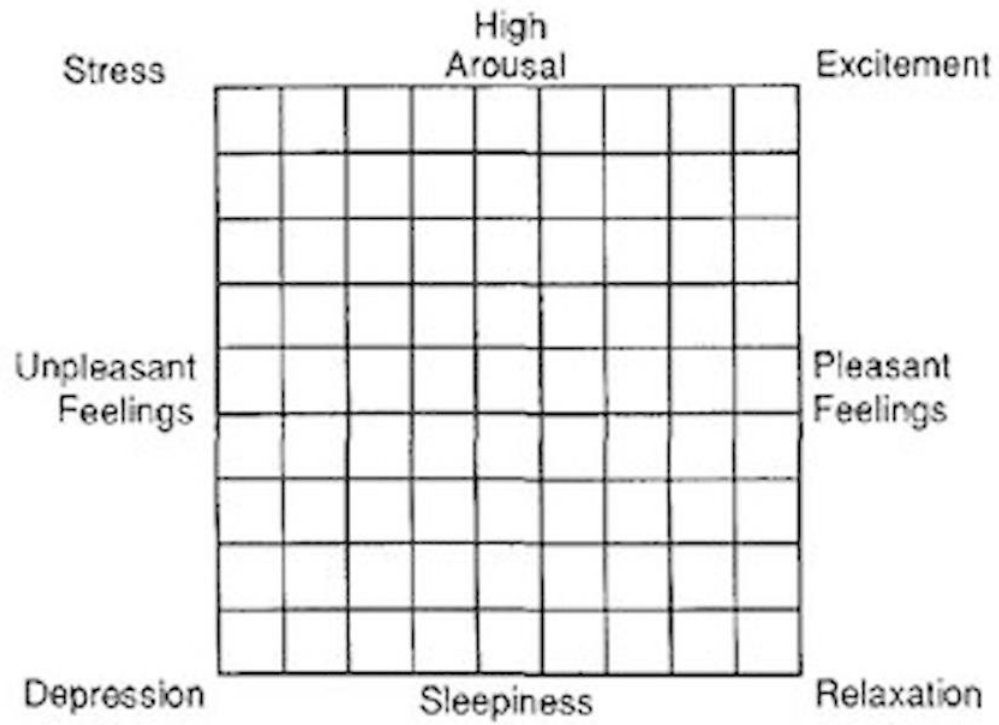
Score impact



Appendix B

The Affect Grid (COV19-QoL; Russell et al., 1989)

Please click on the box that represents how you feel at this moment.



Appendix C

Demographic Questions

1. What is your age? _____
2. What is your gender?
 - a. Male
 - b. Female
 - c. Other / Prefer not to respond
3. What is the highest education you have achieved?
 - a. Did not complete high school
 - b. High school / GED
 - c. Some college
 - d. Bachelor's degree
 - e. Master's degree
 - f. Advanced graduate work or PhD
 - g. Prefer not to respond
4. What is your annual household income?
 - a. Under \$25,000
 - b. \$25,000 - \$49,999
 - c. \$50,000 - \$74,999
 - d. \$75,000 - \$99,999
 - e. \$100,000 - \$124,999
 - f. Over \$125,000
 - g. Not sure / Prefer not to respond

Appendix D

Narcissistic Personality Inventory (NPI-16; Ames et al., 2006)

Read each pair of statements below and select the one that comes closest to describing your feelings and beliefs about yourself. You may feel that neither statement describes you well, but pick the one that comes closest. Please complete all pairs.

1. ___ I really like to be the center of attention
 ___ It makes me uncomfortable to be the center of attention

2. ___ I am no better or no worse than most people
 ___ I think I am a special person

3. ___ Everybody likes to hear my stories
 ___ Sometimes I tell good stories

4. ___ I usually get the respect that I deserve
 ___ I insist upon getting the respect that is due me

5. ___ I don't mind following orders
 ___ I like having authority over people

6. ___ I am going to be a great person
 ___ I hope I am going to be successful

7. ___ People sometimes believe what I tell them
 ___ I can make anybody believe anything I want them to

8. ___ I expect a great deal from other people
 ___ I like to do things for other people
9. ___ I like to be the center of attention
 ___ I prefer to blend in with the crowd
10. ___ I am much like everybody else
 ___ I am an extraordinary person
11. ___ I always know what I am doing
 ___ Sometimes I am not sure of what I am doing
12. ___ I don't like it when I find myself manipulating people
 ___ I find it easy to manipulate people
13. ___ Being an authority doesn't mean that much to me
 ___ People always seem to recognize my authority
14. ___ I know that I am good because everybody keeps telling me so
 ___ When people compliment me I sometimes get embarrassed
15. ___ I try not to be a show off
 ___ I am apt to show off if I get the chance
16. ___ I am more capable than other people
 ___ There is a lot that I can learn from other people

Appendix E

Hypersensitive Narcissism Scale (HSNS; Hendin & Cheek, 1997)

Please answer the following questions by deciding to what extent each item is characteristic of your feelings and behavior using the scale below.

1 = very uncharacteristic or untrue, strongly disagree

2 = uncharacteristic

3 = neutral

4 = characteristic

5 = very characteristic or true, strongly agree

- ____ 1. I can become entirely absorbed in thinking about my personal affairs, my health, my cares or my relations to others.
- ____ 2. My feelings are easily hurt by ridicule or the slighting remarks of others.
- ____ 3. When I enter a room I often become self-conscious and feel that the eyes of others are upon me.
- ____ 4. I dislike sharing the credit of an achievement with others.
- ____ 5. I feel that I have enough on my hands without worrying about other people's troubles.
- ____ 6. I feel that I am temperamentally different from most people.
- ____ 7. I often interpret the remarks of others in a personal way.
- ____ 8. I easily become wrapped up in my own interests and forget the existence of others.
- ____ 9. I dislike being with a group unless I know that I am appreciated by at least one of those present.
- ____ 10. I am secretly "put out" or annoyed when other people come to me with their troubles, asking me for my time and sympathy.

Appendix F

Levenson Self-Report Psychopathy Scale (LSRP; Levenson et al., 1995)

Rate each item below on how much you agree with it using the scale below.

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

1	2	3	4
Disagree Strongly	Disagree	Agree	Agree Strongly

1. Success is based on survival of the fittest; I am not concerned about the losers.
2. I find myself in the same kinds of trouble, time after time.
3. For me, what's right is whatever I can get away with.
4. I am often bored.
5. In today's world, I feel justified in doing anything I can get away with to succeed.
6. I find that I am able to pursue one goal for a long time.
7. My main purpose in life is getting as many goodies as I can.
8. I don't plan anything very far in advance.
9. Making a lot of money is my most important goal.
10. I quickly lose interest in tasks I start.
11. I let others worry about higher values; my main concern is with the bottom line.

12. Most of my problems are due to the fact that other people just don't understand me.
13. People who are stupid enough to get ripped off usually deserve it.
14. Before I do anything, I carefully consider the possible consequences.
15. Looking out for myself is my top priority.
16. I have been in a lot of shouting matches with other people.
17. I tell other people what they want to hear so that they will do what I want them to do.
18. When I get frustrated, I often "let off steam" by blowing my top.
19. I would be upset if my success came at someone else's expense.
20. Love is overrated.
21. I often admire a really clever scam.
22. I make a point of trying not to hurt others in pursuit of my goals.
23. I enjoy manipulating other people's feelings.
24. I feel bad if my words or actions cause someone else to feel emotional pain.
25. Even if I were trying very hard to sell something, I wouldn't lie about it.
26. Cheating is not justified because it is unfair to others.

Appendix G

Machiavellianism Scale (Mach-IV; Christie & Geis, 1970)

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

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

1. Anyone who completely trusts anyone else is asking for trouble.
2. Most people who get ahead in the world lead clean moral lives.
3. It is safest to assume that all people have a vicious streak and it will come when they are given a chance.
4. One should take action only when sure it is morally right.
5. Generally speaking, people won't work hard unless they're forced to do so.
6. It is wise to flatter important people.
7. It is hard to get ahead without cutting corners here and there.
8. People suffering from incurable diseases should have the choice of being put painlessly to death.
9. Most people are brave.
10. The best way to handle people is to tell them what they want to hear.
11. The biggest difference between most criminals and other people is that criminals are stupid enough to get caught.
12. Honestly is the best policy in all cases.
13. Barnum was very wrong when he said there's a sucker born every minute.

14. Most people are basically good and kind.
15. When you ask someone to do something for you, it is best to give the real reasons for wanting it rather than giving reasons which might carry more weight.
16. It is possible to be good in all respects.
17. Most people forget more easily the death of a parent than the loss of their property.
18. Never tell anyone the real reason you did something unless it is useful to do so.
19. There is no excuse for lying to someone else.
20. All in all, it is better to be humble and honest than to be important and dishonest.

Appendix H

Barratt Impulsiveness Scale-Brief (BIS-Brief; Steinberg et al., 2013)

Rate each item below on how much you agree with it using the scale below.

1	2	3	4
Rarely/Never	Occasionally	Often	Almost Always/Always

1. I plan tasks carefully.
2. I do things without thinking.
3. I don't "pay attention."
4. I am self-controlled.
5. I concentrate easily.
6. I am a careful thinker.
7. I say things without thinking.
8. I act on the spur of the moment.

Appendix I

COVID-19-Impact on Quality-of-Life Scale (COV19-QoL; Repišti et al., 2020)

Please rate your level of agreement with each statement using the scale below.

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

Due to the spread of the coronavirus,

1. ... I think my quality of life is lower than before
2. ... I think my mental health has deteriorated
3. ... I think my physical health has deteriorated
4. ... I feel more tense than before
5. ... I feel more depressed than before
6. ... I feel that my personal safety is at risk

Appendix J

Supplementary Analysis

A series of chi-square goodness-of-fit tests were conducted to compare cooperation proportions of framing groups to the baseline cooperation proportions in the gain frame of the prisoner's dilemma (69%), the loss frame of the prisoner's dilemma (47%), and the overall prisoner's dilemma (58%). First, in comparison to the baseline of the gain frame of the prisoner's dilemma, (1) participants were more likely to defect in the loss frame of the prisoner's dilemma ($X^2(1, N = 81) = 18.47, p < .001$), (2) participants were more likely to cooperate in the gain frame of the chicken game ($X^2(1, N = 75) = 4.24, p = .04$), and (3) there was no difference in the loss frame of the chicken game compared to the baseline ($X^2(1, N = 69) = .88, p = .35$). Second, in comparison to the baseline of the loss frame of the prisoner's dilemma, participants were more likely to cooperate in (1) the gain frame of the prisoner's dilemma ($X^2(1, N = 78) = 15.48, p < .001$), (2) the gain frame of the chicken game ($X^2(1, N = 75) = 32.79, p < .001$), and (3) the loss frame of the chicken game ($X^2(1, N = 69) = 7.79, p = .005$). Finally, in comparison to the baseline of the overall prisoner's dilemma, participants were more likely to cooperate in the chicken game, $X^2(1, N = 144) = 11.96, p = .001$.

In addition, the four framing conditions were compared to random chance (50/50) of selecting the cooperation or defection option. Results of the additional chi-square goodness-of-fit tests indicated that, compared to 50/50 chance participants were more likely to cooperate in (1) the gain frame of the prisoner's dilemma, ($X^2(1, N = 78) = 11.54, p = .001$), (2) the gain frame of the chicken game, ($X^2(1, N = 75) = 27.00, p < .001$), and (3) the loss frame of the chicken game ($X^2(1, N = 69) = 5.23, p = .02$); whereas, participants were no more or less likely to cooperate or defect in the loss frame of the prisoner's dilemma ($X^2(1, N = 81) = .31, p = .58$).

Appendix K

Summary of Hypothesis Findings

Table 5

Summary of Hypothesis Testing

Hypothesis	Supported?	Finding
H1	Yes	Individuals were more likely to defect in the loss frame than the gain frame of the prisoner's dilemma (normal-risk condition)
H2a	Yes	Individuals were more likely to defect in the loss frame than the gain frame of the chicken game (high-risk condition)
H2b	Partially	Valence framing was stronger in the loss frame of the chicken game than the prisoner's dilemma, but not the gain frame.
H3a	Yes	All five Dark Triad components (GN, VN, PP, SP, and Mach) were positively correlated with impulsivity and callousness
H3b	Partially	GN, PP, SP, and Mach each uniquely predicted increased impulsiveness in a multiple regression model; VN and SP both uniquely predicted increased callousness and GN uniquely predicted decreased callousness in a multiple regression model
H4	No	Neither the five Dark Triad components nor impulsivity, callousness, and their interaction predicted defection after controlling for framing conditions
H5a	Partially	GN predicted decreased defection and VN predicted increased defection in the gain frame of the prisoner's dilemma
H5b	Yes	The Dark Triad components were not related to defection in the loss frame of the prisoner's dilemma
H6	No	Neither the five Dark Triad components nor impulsivity, callousness, and their interaction predicted defection in the gain frame of the chicken game
H7	No	The mediation hypothesis that impulsivity and callousness would mediate the relationship between the Dark Triad traits and defection could not be tested due to the lack of relationship between the proposed mediators and dependent variable in the data

Note. GN = grandiose narcissism; VN = vulnerable narcissism; PP = primary psychopathy; SP = secondary psychopathy; Mach = Machiavellianism.

Biographical Information

Stephen Doerfler received his Bachelor of Science degree in psychology from Louisiana State University. As an undergraduate, he was a research assistant in both Dr. Emily Elliott's and Dr. Janet McDonald's cognitive research labs. As a graduate student at the University of Texas at Arlington, Stephen gained research experience in developmental, personality, cognitive, and quantitative psychology research in Dr. Jeffery Gagne's Temperament and Development Lab, Dr. William Ickes's Personality and Social Interaction Lab, and Dr. Daniel Levine's Decision-making Lab. During his time as a graduate student, Stephen led, developed, and published a line of research which focused on uncovering the nuances among the Dark Triad traits in relation to both intrapersonal processes and decision making. He also gained experience as a course instructor, a mentor to undergraduate research assistants, a statistics consultant, and as an applied researcher through internships with Verizon, Six Flags, and the City of Fort Worth. He is currently a Senior User Experience Researcher and Data Scientist at Verizon. Stephen earned his doctorate in experimental psychology from the University of Texas at Arlington.