



The utility of the Dark Triad model in the prediction of the self-reported and behavioral risk-taking behaviors among adolescents



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ABSTRACT

Associations among the Dark Triad (psychopathy, narcissism, and Machiavellianism) using a self-report risk measure (i.e., Adolescent Risk-taking Questionnaire) and two behavioral tasks (i.e., Balloon Analog Risk task and Probability Discounting task) were examined to assess risk taking in 248 adolescents. Two dark personality traits, narcissism and psychopathy, have been shown to be significantly predictive of adolescent risk behaviors. This was found to be the case for self-reported risk behaviors, as well as for different behaviorally based risk types. Contrary, Machiavellianism was unrelated to either type of risk-taking assessment. Reliably, these results suggest that darker personality variables may prove valuable in understanding risk-taking behaviors in adolescents.

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1. Introduction

Though risk taking has been defined in various ways, common themes across definitions seem to balance the potential gains and losses of risky behaviors (Moore & Gullone, 1996). However, different conceptualizations about what underlies risk taking have resulted in using different instruments for assessing risk-taking behaviors. Accordingly, two divergent approaches have been used in the assessment of risk-taking propensity. One approach centers on assessment of personality traits primarily through self-report instruments, while the second approach views risk taking as a cognitive process and includes the behavioral tasks that measure respondents' choices between concrete alternatives. Several theories suggest that both forms of risky behavior should be significantly associated among individuals (Skeel, Neudecker, Pilarski, & Pytlak, 2007).

There are numerous reasons why someone chooses to behave in a high-risk manner. Given the possibility that individuals might have a dispositional tendency to engage in risky behaviors bears considering the traits of the Dark Triad personality construct. Specific to the current investigation, preliminary research has shown associations among the Dark Triad traits and specific risky activities, such as financial investment strategies (Foster, Misra, & Reidy, 2009), aggressive driving (Britt & Garrity, 2006), and gambling (Lahey, Rose, Campbell, & Goodie, 2008).

1.1. Dark Triad

The Dark Triad – psychopathy, narcissism, and Machiavellianism – represents a set of three socially aversive personality characteristics (Paulhus & Williams, 2002). Psychopathy is defined by high callousness, thrill seeking, interpersonal antagonism and manipulation (Hare & Neumann, 2008). Individuals high in narcissism tend to focus largely on themselves and are characterized by self-absorption, dominance, and feelings of entitlement (Emmons, 1987). Machiavellianism is characterized by self-interest and tendencies toward deceptiveness and the manipulation of others (Cooper & Peterson, 1980).

1.2. Dark Triad and risk taking

Specific to the current investigation, two negativistic traits with links to risk taking are psychopathy and narcissism (e.g., Crysel, Crosier, & Webster, 2013; Jonason, Koenig, & Tost, 2010; Jones, 2013). Risk-taking in psychopathy is the result of their erratic lifestyle (Hare & Neumann, 2008). People high in psychopathy cannot regulate impulses effectively and take needless risks for minimal gains (Jones, 2013). Narcissism, similar to psychopathy, has been linked with self-reported risky behavior (Campbell, Goodie, & Foster, 2004; Crysel et al., 2013). The associations between narcissism and risk taking have been proven not only within the self-reported measures of components of risk taking but also within the behavioral assessment methods of risk (Crysel et al., 2013; Lahey et al., 2008). People high in narcissism may have an illusion of control (Jones, 2013). Those individuals tend to be biased in their decision-making, and downplay potential chances of loss, all of

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which are factors that lead them to risky behaviors (e.g., Lakey et al., 2008). In contrast to psychopathy and narcissism, individuals high in Machiavellianism exhibit an inconsistent connection with single factors that are complementary with risky decisions (e.g., sensation seeking) or no significant association with behavioral measures of risk (Crysel et al., 2013; Jones, 2013). In fact, Machiavellianism is linked to risky behavior only when there is little or no risk of being caught (Jones, 2013). We are not aware of any studies that have examined this relationship in an adolescent population.

1.3. Limitations of previous research

Because of our interest in individual differences, we attempt to provide data by employing a general risk factor (Moore & Gullone, 1996). Previous research has been related to the narrow focus of risk-taking behavior – that is, most studies focused solely on impulsivity, sensation seeking, discounting, and gambling behaviors, which are thought to represent lower level personality components that complement risky decision making (Campbell et al., 2004; Crysel et al., 2013; Jones, 2013; Lakey et al., 2008). Furthermore, the conceptualization of risky behavior has typically encompassed only maladaptive risks, although there is some evidence that traits underlying risk taking in its negative sense may also underlie socially approved risky behaviors (e.g., thrill seeking; Moore & Gullone, 1996). Finally, the vast majority of research in risky decision making has been conducted with adults rather than adolescents. This is the first study that investigates this relationship in adolescents.

2. Overview of the present study

The aim of the present study was to evaluate the predictive capacity of the Dark Triad personality traits in explaining self-reported and behavior-based risk-taking behaviors. By using a multidimensional risk-taking measure, Adolescent Risk-taking Questionnaire (Gullone, Moore, Moss, & Boyd, 2000), it was possible to assess the roles of different predictors for various domains of positive risk-taking behaviors (thrill seeking and recklessness) and negative risk-taking behaviors (rebelliousness and anti-socialness). It was hypothesized that outgoing personality dimensions (i.e., psychopathy and narcissism) would be related to all four self-reported categories of risk-taking domains (i.e., thrill seeking, recklessness, rebelliousness, and anti-socialness; Hypothesis 1). It was further hypothesized that two behavioral measures of risk taking (i.e., Balloon Analog Risk and Probabilistic Discounting tasks) would be associated with narcissism (Hypothesis 2). However, based on previous research, which found a lack of correlations between risk taking and Machiavellianism, it was hypothesized that we will not find a significant association between the two (Hypothesis 3). Finally, we predicted that the association between risk-taking measured by self-report and behavioral tasks will be correlated (Hypothesis 4). Previous research has demonstrated that various forms of risky behavior are highly associated among individuals (Mishra & Lalumière, 2011; Skeel et al., 2007).

3. Methodology

3.1. Procedure

The study involved the completion of the computerized versions of the Balloon Analog Risk task and the Probabilistic Discounting task and pen-and-paper versions of the Adolescent Risk-taking Questionnaire and Dirty Dozen measure. Two behavioral tasks were programmed in the z-Tree software (Zurich Toolbox for Readymade Economic Experiments; Fischbacher, 2007). All questionnaires and tasks were presented in random order.

3.2. Participants

The sample for this study was comprised of 248 German adolescents (109 boys and 139 girls) who ranged in age from 14 to 18 years ($M = 15.9$, $SD = 1.45$). Individuals were recruited from a parent volunteer database. The Nakao and Treas (1994) index of occupational prestige was used to indicate the socioeconomic status of the adolescents' families. All the social classes were represented in the sample. Status scores can range from 0 to 100. The mean socioeconomic index score was 53.69 ($SD = 21.17$; range from 20.86 to 97.30). All adolescents and their parents gave written informed consent after the nature of the study was explained to them.

3.3. Materials

3.3.1. Dark Triad measure

The Dirty Dozen measure of the Dark Triad (German version by Küfner, Dufner, & Back, 2014), which is comprised of 12 items, was used in this study. Responses were scored on a 9-point Likert scale ranging from 1 (strongly disagree) to 9 (strongly agree) (psychopathy $\alpha = .77$; narcissism $\alpha = .89$; Machiavellianism $\alpha = .87$).

3.3.2. Adolescent Risk-taking Questionnaire (ARQ)

The Adolescent Risk-taking Questionnaire (Gullone et al., 2000) consists of two parts. The first section of the questionnaire measures adolescents' perception of risk for 22 behaviors on a five-point Likert scale that ranges from 0 (not at all risky) to 4 (extremely risky). The second part indicates adolescents' frequency to engage in these behaviors on a five-point Likert scale that ranges from 0 (never done) to 4 (done very often). The ARQ assesses the risks associated with four behaviors – thrill seeking (example items: snow skiing, rollerblading; $\alpha_{\text{behavior}} = .87$, $\alpha_{\text{judgment}} = .86$), rebelliousness (example items: smoking staying out late; $\alpha_{\text{behavior}} = .80$, $\alpha_{\text{judgment}} = .82$), recklessness (example items: driving without a license, having unprotected sex; $\alpha_{\text{behavior}} = .79$, $\alpha_{\text{judgment}} = .80$), and anti-socialness (example items: talking to strangers, cheating; $\alpha_{\text{behavior}} = .91$, $\alpha_{\text{judgment}} = .88$).

The English version of the ARQ was adapted and translated into the German language. To ensure that the items resemble the meaning of the original English items as closely as possible, we followed a common procedure of back-translation in which a text is translated from a source into a target language, and a second interpreter independently translates the text back into the source language. The English version of the measure was first translated into German and then back-translated into English by two translators, according to the guidelines developed by the International Test Commission (Hambleton, 2001). Afterwards, both translators compared the original version and the back-translated version for equivalence of meaning. The accuracy of the translation was evaluated by comparing the original and back-translated versions.

3.3.3. Probabilistic discounting task

Probabilistic discounting – in this case, the probability of receiving a reward – was assessed at five probability interval values – 5%, 25%, 50%, 75%, and 95%. On each probabilistic task trial, participants chose between a certain amount of money and the possibility of receiving €200 with a specified probability (i.e., 'Would you rather receive a definite €20 or receive a possible €200 with a 25% chance of getting it?'). This computerized task used an adjusting amount procedure – adjusting the certain amount in increments or decrements of $\pm\epsilon 10$ – to derive indifference points between the probabilistic standard and the certain adjusting options for each of the five probabilities assessed (for details, see Richards, Zhang, Mitchell, & de Wit, 1999). Although the probabilistic task and the outcomes were hypothetical, participants were instructed to act as if the situation was real. Participants were told: *You will not receive any of the rewards that you choose, but we want you to make your decisions as though you were really going to get the rewards you choose.*

An area-under-the-curve (AUC) method was used to characterize the probabilistic discounting rate (Myerson, Green, & Warusawitharana, 2001). Obtained AUC value represents a proportion on a range between 0.0 and 1.0 where larger AUC values are indicative of slower or no discounting and lower AUC values mean greater levels of discounting.

3.3.4. Balloon Analog Risk Task (BART)

The Balloon Analog Risk task is a computerized measure of risk-taking behavior (Lejuez et al., 2002). Participants 'pump up' an on-screen balloon by clicking a computer mouse. The goal of the task is to make the balloon as large as possible without causing it to explode. Participants are given a hypothetical monetary reward for each pump if they decide to 'cash out' before the balloon explodes. The task consists of 30 trials/balloons. While the balloons have different explosion probabilities, the average explosion point is 60 pumps.

4. Results

First, after including a Bonferroni correction for multiple comparisons, the results indicated that boys scored higher on psychopathy ($t(246) = 6.39, p < .05$) and self-reported anti-social judgments ($t(246) = 11.04, p < .05$) compared to girls. However, none of the correlations were moderately significant according to the participant's sex. As a result, the data from the boys and the girls were combined in all of the subsequent analyses. Therefore, the data from the two genders were combined for all subsequent analyses.

4.1. Associations between risk-taking and the Dark Triad

Table 1 presents the inter-correlations among the Dark Triad traits, self-reported measures, and behavioral measures of risk-taking.

With regard to personality, the Dark Triad traits inter-correlated at best modestly, indicating that they should be treated as distinct traits in further analyses. Two subscales of the Dark Triad, psychopathy and narcissism, were each negatively correlated with most ARQ subscales of judgment components (Machiavellianism being the exception). That is, higher scores on psychopathy and narcissism were related with lower risk judgements for each type of risky behavior. Moreover, the behavior subscales of the ARQ were positively correlated with the same traits of the Dark Triad. That is, higher scores on psychopathy and narcissism corresponded with higher frequencies of participating in self-reported risky activities. Machiavellianism, on the other hand, was positively associated with self-reported thrill-seeking risk behavior. All correlations were modest in size.

Behavioral risk taking correlated less consistently with the Dark Triad traits, compared with self-reported risk taking. The most prominently associated dark personality factor appeared to be narcissism, which was significantly associated with behavioral risky decision-

making as measured by the Probabilistic Discounting task. That is, individuals high in narcissism preferred the larger uncertain sum of money compared with the smaller certain sum. Similarly, with respect to that BART total explosions individuals high in narcissism executed more pumps and consequently caused more explosions. On the other hand, psychopathy was weakly significantly correlated with the total number of balloon explosions. The extent to which socially aversive personality traits can be used to predict self-reported risk behaviors and behavior-based risk taking was also examined through multiple regression analyses. For this purpose, self-reported overall risk behavior and each of the two behavioral risk measures were used as dependent variables. The Dark Triad traits were entered as predictors. Different personality factors were important predictors for different types of risk-taking behaviors. Specifically, psychopathy and narcissism were significant predictors for self-reported overall risk behavior. The only personality factor that significantly predicted both behavior-based risk measures was narcissism, whereas psychopathy was a marginally a significant predictor for the second behaviorally-based risk-taking measure – BART total explosions (see Table 2).

4.2. Self-report and laboratory behavioral measures of risk-taking

Table 1 contains the correlation coefficients between the risk behaviors and risk judgment factors of the ARQ measure. What is most evident is that risk judgments and risk behaviors were generally negatively related. Thus, the more risky the adolescents perceived the behavior, the less likely they are to be engaged in that particular behavior. By contrast, both behavioral risk-taking measures (i.e., Probabilistic Discounting task and Balloon Analog Risk task) were not significantly associated. Moreover, analysis conducted between self-report and behavioral measurement methods of risk-taking revealed only two significant correlations. There was a positive correlation between two self-reported subscales from the ARQ (i.e., thrill-seeking and anti-social) and the total number of balloon explosions on the BART measure.

5. Discussion

The aim of the present study was to evaluate the predictive capacity of the Dark Triad personality traits to explain self-reported and behavior-based measures of risk-taking behaviors. The results of the current study indicate that narcissism and psychopathy personality variables accounted for significant levels of variance within self-reported risk behaviors (Hypothesis 1) and with respect to the behavioral BART risk task. However, only narcissism accounted for a significant prediction of the Probabilistic Discounting measure of risky behaviors (Hypothesis 2).

Such risk-taking tendencies in psychopathy are primarily the consequences of the factors associated with the psychopathy syndrome, such

Table 1
Inter-correlations between the risk judgment and behavior factors, and the Dark Triad personality factors.

	Self-report risk-taking behaviors				Personality factors		
	Thrill-seeking	Rebellious	Reckless	Antisocial	Narcissism	Psychopathy	Machiavellianism
Judgment of riskiness							
Thrill-seeking	–.63**	–.22**	–.21**	–.29**	–.37**	–.20*	.00
Rebellious	–.09	–.45**	–.32**	–.21**	–.22**	–.19*	.05
Reckless	–.24**	–.23**	–.83**	–.48**	–.30**	–.23**	–.00
Antisocial	–.21**	–.20*	–.25**	–.51**	–.19*	–.54**	.01
Personality factors							
Narcissism	.39**	.23**	.30**	.00	–	.34**	.22**
Psychopathy	.20**	.29**	.48**	.51**	.34**	–	.16*
Machiavellianism	.21**	–.01	.01	.00	.22**	.16*	–
Behavioral risk							
Explosions BART	.28**	.01	–.04	.19*	.35**	.19*	.01
Probab. Discount.	.00	.02	.00	.02	–.52**	–.04	.00

* $p < 0.05$.

** $p < 0.01$ (two-tailed).

Table 2
Predictors of risky behaviors.

Dependent variable	R^2	Adjusted R^2	F	Predictor	Beta	t
Self-reported overall risk behavior (ARQ)	.51	.48	44.25**	Narcissism	.46	9.75**
				Psychopathy	.39	6.43**
				Machiavellianism	.06	1.09
Probabilistic discounting	.28	.25	13.38**	Narcissism	−.46	2.67**
				Psychopathy	.05	0.19
				Machiavellianism	.01	−0.02
Total number of balloon explosions (BART)	.37	.34	36.63**	Narcissism	.28	17.14**
				Psychopathy	.12	15.67 ^a
				Machiavellianism	−.01	−0.25

** $p < .01$; ^a: $p = .10$.

as sensation seeking, impulsivity, erratic lifestyle, and antisocial tendencies (e.g., Crysel et al., 2013; Hare & Neumann, 2008; Patrick, Hicks, Krueger, & Lang, 2005). On the other hand, while narcissism predicted no engagement in antisocial behaviors, it predicted more engagement in thrill-seeking behavior compared with people high in psychopathy. This finding fits the general description of the main characteristics of individuals high in narcissism – overconfidence, unrealistic optimism, and certainty – which drive narcissistic individuals to take risks (Campbell et al., 2004). However, those high in psychopathy take risks for reasons different from those who are high in narcissism. Narcissistic motivations tend to stem from novelty seeking and reward dependence, whereas psychopathic risk taking is associated with poor impulse control (Jones, 2013).

Although both narcissism and psychopathy are linked to behavioral risk, the type of risk is quite different. Narcissism, the facet most closely associated with behavioral risk measures, was positively related to both behavioral risk-taking measurement methods, while psychopathy was related only to the balloon task (*Hypothesis 2*). Individuals high in narcissism may have cognitive biases resulting in an illusion of control (Hare & Neumann, 2008; Jones, 2013), and thus, they strongly believe that they are unlikely to lose even when there is a low probability of success. According to this view, narcissists engage in behaviors that get them into trouble not because they are insensitive to potential problems caused by risky behaviors but because the enticement of potential rewards stemming from risky behaviors is overwhelming. Contrary to narcissism, people high in psychopathy demonstrated poorer response inhibition and a greater willingness to make risky decisions, as indicated in the BART task. Interestingly, however, psychopathy was not significantly associated with the probabilistic discounting task. One possible explanation for this may be related to the frustration and boredom psychopathic individuals encountered with the discounting task, which required individuals to make approximately 100 choices between certain and probabilistic sums of money (Richards et al., 1999).

Finally, no unique relationships between Machiavellianism and risk taking were identified in the present study (thrill seeking being the exception; *Hypothesis 3*). At the core of the Dark Triad lies manipulation and callousness (Paulhus & Williams, 2002). When this core is combined with anti-social tendencies (i.e., psychopathy) and overconfidence (i.e., narcissism), it appears that individuals are willing to take risk. Interestingly, although Machiavellianism is linked to manipulation and callousness as well, it has no association with anti-social behavior or recklessness, but rather strategy and long-term planning (Jones & Paulhus, 2009). In fact, Machiavellians take needless risks when there is maximal gain with minimal risk of being caught (Jones, 2013). Also, although Machiavellianism has association with anti-social tendencies in the literature (Cooper & Peterson, 1980), no apparent significant relationships between Machiavellianism and the anti-social risk-taking facet were identified in the present study. However, this result is not surprising given previous research. In direct comparisons, it seems clear that psychopaths are more likely than Machiavellians to have confronted the justice system (Jones, 2013).

Contrary to our expectations, self-reported and behavioral instruments of risk-taking show a distinct pattern of associations. In an analysis conducted between self-report and behavioral measurement methods of risk taking revealed only two significant correlations among number of total balloon explosions, thrill-seeking and anti-social self-reported behaviors (*Hypothesis 4*). In self-report measures, individuals must recognize what behavioral tendencies they are required to report. Thus, self-reported risk behaviors are more sensitive to bias or may be influenced by social desirability responses. Furthermore, while there was no significant correlation between two behavioral task measures of risk, results indicate that various instruments of risk propensity may measure different components of risky behavior (Skeel et al., 2007). Also, as reported in previous studies (e.g., Gullone et al., 2000; Moore & Gullone, 1996), an inverse relationship was found between self-report risk judgment and engagement in thrill-seeking, rebellious, reckless, and anti-social behaviors. Thus, risk-taking behavior was most likely to occur when the risks were not perceived as being too great (although of course risk-taking is determined by more factors than perception of risk).

5.1. Limitations

Clearly, however, more work of this nature is required before firm conclusions can be drawn. Although in both behavior-based risk tasks the outcomes were hypothetical, participants were instructed to act as if they were real. In future studies, participants should experience actual consequences of their choices, e.g., either winning or losing small prizes. However, an extensive literature suggests no differences in discounting between real and hypothetical rewards in discounting tasks (e.g., Madden, Begotka, Raiff, & Kastern, 2003). Second, although the focus of this study was on socially aversive personality traits and their influence on risk-taking behaviors, we cannot exclude the possibility that the demonstrated risk-taking behaviors of the participants in this study were due to sensation seeking. Third, although risk-taking behavior is part of the developmental process, the way in which risk-taking activities are expressed depends on cultural socialization and social desirability (e.g., parenting practices, school, media; Moore & Gullone, 1996), variables that were not measured. Finally, in assessing the Dark Triad, we used one recently developed short instrument – the Dirty Dozen measure – which is controversial. Although some researchers have found it to be useful (e.g., Jonason & Luévano, 2013), the instrument has been critiqued in several recent reports (Lee et al., 2013; Maples, Lamkin, & Miller, 2014; Miller et al., 2012). Particularly, compared with standard long multi-item measures of the Dark Triad, the Dirty Dozen converges less strongly with other Dark Triad measures (e.g., Miller et al., 2012). Some caution is therefore warranted regarding the generalizability of results obtained from the Dirty Dozen. Future study should attempt to replicate our findings using the long inventories for the Dark Triad. It would also be important to replicate this research in a clinical setting

in order to examine whether these results can be generalized to youths that actually display aggression and anti-social problems.

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