



The Dark Triad, reinforcement sensitivity and substance use



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ABSTRACT

Substance use is frequently perceived as a problematic behavior associated with negative social, psychological and physiological consequences. Despite the perception that substance use constitutes problematic behavior, previous literature on the personality characteristics of substance users is scarce. The majority of past research has focused on clinical samples as opposed to normative substance use among non-clinical samples. The current study investigated the relationship between the Dark Triad, reinforcement sensitivity and substance use. Participants consisted of 242 students (122 males and 120 females) from Western University ages 18 to 37 years ($M = 18.85$, $SD = 2.05$). Participants completed an online survey that included the Short Dark Triad, the BIS/BAS scales and a substance use questionnaire. Results revealed that all components of the Dark Triad were positively correlated with behavioral approach, psychopathy was negatively correlated with behavioral inhibition, psychopathy and narcissism were positively correlated with substance use, and behavioral inhibition was negatively correlated with substance use. Contrary to expectations, there was no significant mediation among the Dark Triad components, BAS and substance use. By identifying the personality traits of substance users, researchers can attempt to decrease the costs associated with substance use by developing prevention programs that target high-risk individuals.

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Substance use is often regarded as a risk taking behavior, allowing the user to experience rewards such as elation and positive affect. Certain individuals may have a predisposition towards substance use, depending on differences in personality. A personality receptive to reward may be prone to engage in substance use. Three aversive personality traits that are more prone to risk-taking and reward seeking behavior include narcissism, psychopathy and Machiavellianism; collectively referred to as the Dark Triad. Although personality traits are involved, engaging in risk-taking situations may also depend on the level of drive or motivation and accompanying levels of anxiety associated with the risky behavior. The interaction between drive and anxiety is referred to as reinforcement sensitivity. Despite the inter-relations among risky behavior and the need for reward, there has been no previous research investigating the relationship between the Dark Triad, reinforcement sensitivity and substance use. Research on this topic may allow researchers to identify individuals at high risk for substance use and subsequently develop prevention programs targeting these high-risk individuals.

1.1. The Dark Triad

The Dark Triad consists of three maladaptive personality traits: narcissism, psychopathy and Machiavellianism. Narcissistic individuals possess an inflated self-esteem and display a sense of entitlement and

grandiosity (Paulhus & Williams, 2002). Psychopathy refers to highly impulsive individuals who engage in thrill-seeking behavior and show a disregard for rules (Paulhus & Williams, 2002). Machiavellian individuals are characterized by interpersonal coldness and are highly manipulative (Paulhus & Williams, 2002). Although all three elements of the Dark Triad display moderate intercorrelations, they are distinct constructs and it is useful to study each domain of the triad individually (Furnham, Richards, & Paulhus, 2013).

Of all the maladaptive personality traits, Paulhus and Williams (2002) propose that narcissism, psychopathy and Machiavellianism are the most aversive. Previous literature has expanded from diagnosed psychopaths to include non-pathological samples, allowing researchers to generalize these maladaptive personality traits to a wider population. Some of these maladaptive behaviors include “toxic leadership” styles (Paulhus & Williams, 2002), the pursuit of short-term relationships, as well as prejudicial attitudes (Paulhus & Williams, 2002).

1.2. Reinforcement Sensitivity Theory

Engaging in risk taking behaviors requires an individual, consciously or unconsciously, to disregard his or her inhibitions and anxiety. This underlying process is described in Gray (1982) Reinforcement Sensitivity Theory, which uses physiological grounds to establish approach and avoidance behaviors, which were developed on the basis of Eysenck's introversion–extraversion theory of personality. Gray (1982) identified two systems underlying behavior: the behavioral inhibition system (BIS) and the behavioral approach system (BAS). The BIS is responsive

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to cues relevant to anxiety and is sensitive to punishment and novelty and “inhibits behavior that may lead to a negative or painful outcome” (Carver & White, 1994). Conversely, the BAS is sensitive to cues relevant to reward and goal-directed behavior and is associated with positive affect. The BAS can be broken down into three different subscales: reward responsiveness (an individual's positive response to an anticipated reward), drive (goal pursuit) and fun seeking (spontaneous actions towards a rewarding event; Carver & White, 1994; Gray, 1982).

An individual with high levels of BAS and low levels of BIS may be more prone to engage in approach behaviors without any accompanying anxiety. Such an individual is responsive to the rewards of the approach behavior and lacks sensitivity to potential punishments (Carver & White, 1994; Simons, Dvorak, & Lau-Barraco, 2009). An individual with high BIS and low BAS may refrain from approach behaviors because of the associated high levels of anxiety and fear of punishment (Carver & White, 1994; Simons et al., 2009). Individual differences in personality may influence the corresponding level of BIS and BAS exhibited in the individual, which consequently influences their likelihood to engage in approach and avoidance behaviors.

1.3. Substance use

The approach behavior used in the current study is alcohol and drug use. Substance use among the general population is increasingly becoming a public health issue and is associated with many social, psychological and physiological costs that affect both the user and individuals associated with the user (Ham & Hope, 2003).

Due to the prevalence of substance use among young adults and the negative implications associated with it, it is crucial to identify the mechanisms behind increased risk of substance use (Ham & Hope, 2003). By identifying the personality traits related to it, researchers can better understand the reasons and risk factors and develop targeted intervention programs to prevent substance use among these high-risk groups. In addition, the knowledge gained about the personality traits associated with substance use can be combined with environmental and genetic risk factors to address the individuals at highest risk. By decreasing drug and alcohol use, the costs associated with substance use may also decrease.

1.4. Substance use and reinforcement sensitivity

The dopamine neurotransmitter system is one way to explain the relationship between high BAS and substance use (Depue & Collins, 1999). Specifically, individuals with high BAS levels thrive on seeking reward and may engage in behaviors that increase the levels of dopamine in the brain, subsequently associated with reward responsiveness (Depue & Collins, 1999). Previous research on clinical samples has indicated that individuals with substance use disorders have heightened levels of BAS, specifically fun seeking and drive (Franken, 2002). Franken and Muris (2006) provide two explanations as to why individuals with substance use disorders have an increased BAS. First, such individuals are more receptive to novelty and engage in more risk taking, leading to possible exposure to environments with easy access to drugs. Second, Franken and Muris (2006) note that it is plausible that the increased level of BAS in clinical samples is due to the abuse of the drug itself (Franken & Muris, 2006). For example, the lowered inhibition from the effects of the drug may lead a substance user to engage in riskier behavior since they are not experiencing the anxiety associated with the potentially dangerous situation.

Research has also been conducted on substance use and BAS activity in non-clinical samples. Franken and Muris (2006) found that BAS activity was positively correlated with illegal substance use in college students and to some extent negatively related to BIS activity. The most robust relations were between fun seeking and the number of illegal substances used, the amount of alcohol used and binge drinking. Zisserson and Palfai (2007) expanded on these findings. They found

that Individuals with high BAS scores displayed strong urges to drink before and after they were exposed to alcohol cues (Zisserson & Palfai, 2007).

In summary, individuals with an increased BAS system have been shown to engage in more substance use in both clinical and non-clinical samples. BIS on the other hand, does not play as large a role in substance use. This can be explained by the rewarding properties of alcohol and drugs and the increased reward seeking behavior of individuals with high BAS. Specifically, individuals with an increased BAS are especially receptive to activities that are rewarding and since drugs and alcohol have rewarding properties, individuals with a high BAS may be more prone to engage in substance use. In addition, certain personality types may vary in the level of behavioral approach and inhibition exhibited.

1.5. The Dark Triad and reinforcement sensitivity

Previous literature has consistently reported an association between psychopathy and reward seeking behavior (Paulhus & Williams, 2002; Veselka, Schermer, & Vernon, 2012). Individuals with psychopathic traits have been shown to have an increased BAS and decreased BIS (Roose, Bijttebier, Claes, & Liliensfeld, 2011). These findings imply that an individual with psychopathic traits is more likely to engage in approach behaviors due to their impulsivity and because they do not experience anxiety or fear of potential punishment. The findings from Hopley and Brunelle (2012) indicate that a psychopath's impulsivity mediated the relationship between psychopathy and substance use. Thus, a psychopathic individual may engage in substances due to his or her impulsive behavior.

A similar pattern of BAS has been found among narcissistic individuals. MacLaren and Best (2013) found that narcissism was positively correlated with substance use, and this relationship was mediated by extraversion. These findings suggest that not only is there a relationship between narcissism and substance use, but it is dependent on extraversion, which is associated with the BAS system. Extraversion is the tendency to be sociable and outgoing (Costa & McCrae, 1992) and is an important dimension of the BAS system, because to engage in approach behaviors an individual must be willing to actively participate in social situations that warrant approach behaviors. Specifically, Foster and Trimm (2008) also found that narcissism was related to stronger approach behaviors and lower avoidance behaviors. These results indicate that narcissistic individuals have higher BAS levels and lower BIS levels.

Although scarce, there has been some research on Machiavellianism and risk taking. Rim (1966) found that Machiavellian individuals make higher risk taking decisions. Weinstein and Martin (1969) also suggest that Machiavellianism is associated with extraversion and susceptibility to risk taking. This suggests that Machiavellian individuals may be more prone to approach behaviors due to their increased chance of risk taking, however no previous research has examined the relationship between Machiavellianism and BAS directly.

1.6. The Dark Triad and substance use

As previously mentioned, the Dark Triad is a cluster of aversive personality traits that make an individual more driven towards rewarding activities, specifically substance use. However research on the Dark Triad and substance use has focused mostly on individuals with psychopathy. The only study to account for substance dependence, psychopathy and reinforcement sensitivity was conducted by Hopley and Brunelle (2012), who examined the relationship between psychopathy and substance dependence in an incarcerated population and found that psychopaths demonstrated a higher prevalence of alcohol and drug use, mediated by impulsivity (Hopley & Brunelle, 2012). Unfortunately, Hopley and Brunelle's (2012) conclusions are based on an incarcerated sample using clinical measures of psychopathy and

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