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# Are Normally-Distributed Dark Triad Traits Associated with Trait Mindfulness in University Students?

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ARE NORMALLY-DISTRIBUTED DARK TRIAD TRAITS ASSOCIATED WITH  
TRAIT MINDFULNESS IN UNIVERSITY STUDENTS?

By

Antonette Scavone, H.B.Sc.

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Submitted to the Faculty of Graduate Studies  
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2017

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University Students?

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April 24, 2017

## AUTHOR'S DECLARATION OF ORIGINALITY

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## ABSTRACT

The Dark Triad, which encompasses psychopathy, Machiavellianism, and narcissism, has been associated with difficulties with identifying and describing emotions, labelled alexithymia. Narcissism, however, has been associated with greater emotional intelligence, which includes the ability to regulate and utilize one's emotions in problem solving. Research has yet to examine the association of the Dark Triad and mindfulness, with mindfulness referring to awareness of one's thoughts and emotions in the present moment. The current study investigated the association between the Dark Triad traits and trait mindfulness, while examining the role of alexithymia and emotional intelligence in this association (N=246). Using linear regression models, higher scores of psychopathy were not found to be a predictor of mindfulness. However, higher scores of Machiavellianism were associated with lower levels of mindfulness, and higher scores of narcissism were associated with higher levels of mindfulness, with alexithymia mediating these associations. These findings indicate the potential benefit of emotion regulation skills training via mindfulness based therapy techniques to improve emotion identification and empathy among these individuals.

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## LIST OF ABBREVIATIONS

EI	Emotional Intelligence
EIS	Emotional Intelligence Scale
FFMQ	Five Facet Mindfulness Questionnaire
MCAR	Missing Completely at Random
PFC	Prefrontal Cortex
SD3	The Short Dark Triad
TAS-20	Toronto Alexithymia Scale

## CHAPTER I

### **Introduction**

Awareness of one's thoughts and emotions in the present moment, typically subsumed under the rubric of mindfulness, is a challenge for a number of reasons, including difficulty sustaining attention on a single topic, the tendency to worry/ruminate, and an inability to identify emotions. Those who exhibit Dark Triad traits, including psychopathy, Machiavellianism, and narcissism also experience difficulty in identifying their emotional states, also labelled alexithymia. The extant research has identified an association between alexithymia and each of the Dark Triad traits, with little research conducted on the Dark Triad as a larger construct. To the knowledge of the author, research has yet to be conducted to identify the level of trait mindfulness reported among those characterized by Dark Triad traits.

The goal of the present study is to determine and describe the association between Dark Triad traits and trait mindfulness among a non-clinical sample, with the association between the constructs of interests and alexithymia and emotional intelligence guiding study hypotheses. The aim of the literature review is to present extant research on the constructs of the Dark Triad, mindfulness, and alexithymia, followed by the association documented for the Dark Triad and alexithymia, and mindfulness and alexithymia.

## CHAPTER II Review of Literature

### **Mindfulness**

The concept of mindfulness originally came from Buddhist meditation practices (Kabat-Zinn, 2013). Induced or state mindfulness is typically defined as the process of bringing awareness and nonjudgmental acceptance to one's present moment experience of thoughts, emotions, and bodily sensations (Bishop et al., 2004; Kabat-Zinn, 1990; Reid et al., 2014). Non-judgement refers to observing one's thoughts, emotions, and physical sensations without engaging with them through further thought, evaluation, or analysis. Focusing on the present moment refers to only observing what is presently occurring, and without ruminating over past events or imagining future events. There are a variety of definitions of mindfulness influenced from Buddhism and academia. A definition from Buddhism notes that mindfulness is the clear and single-minded awareness of what actually happens to us and in us at the successive moments of perception (Nyanaponika, 1972, p. 5; Dane, 2011). Mindfulness, thus, involves being aware of internal and external factors in tandem, with a focus on either one solely resulting in a lack of mindfulness. Thondup (1996) defines mindfulness as giving full attention to the present, without worries about the past or future, taking a Buddhist and academic view of mindfulness.

Much of the recent interest in mindfulness and mindfulness-based treatments can be traced to Kabat-Zinn's (1990) mindfulness-based stress reduction program. Kabat-Zinn (2013) explains that mindfulness is an approach to developing new kinds of agency, control, and wisdom, using our inner capacity to pay attention, as well as the awareness, insight, and compassion that naturally arises from paying attention in specific ways. Ignoring the present moment in favour of future moments leads to a lack of awareness

and understanding of one's mind, and how it influences one's perceptions and actions (Kabat-Zinn, 2005). Furthermore, it limits one's ability to recognize how they are connected to others and the world around them (Kabat-Zinn, 2005).

Mindfulness is differentiated from other forms of attention and awareness processes in that mindfulness focuses on the activity or task in the present moment utilizing a broad range of attentional breadth including attending to a variety of stimuli (Dane, 2011), such as the breath, bodily sensations, sounds in the environment and so on. Other states of attention have been found to be similar to mindfulness, but differ in that they do not focus solely on the present moment, or they have a narrower breadth of attention by ignoring stimuli that are not directly related to the task (Dane, 2011). When mindfulness may be cultivated intentionally, such as in mindfulness training with individuals learning the practice of mindfulness, it is sometimes referred to as deliberate or induced mindfulness (Kabat-Zinn, 2015). When mindfulness spontaneously arises, as it tends to do the more it is cultivated intentionally, it is sometimes referred to as effortless mindfulness (Kabat-Zinn, 2015). Therefore, practicing mindfulness techniques over time can aid an individual in more easily "dropping into mindfulness," without significant effort.

Trait mindfulness, or the general disposition toward being mindful in daily life, is not necessarily the result of training and may be present in varying degrees in all individuals. Kabat-Zinn (2005) noted that attaining a mindful state of consciousness is an inherent human capacity, implying that most people have been or at least can be mindful at one point or another (Dane, 2011). Although mindfulness may vary from moment to moment within a person, there is considerable evidence of individual differences in

mindfulness, suggesting that it is a state-level construct that can also be assessed at the trait level (Allen & Kiburz, 2012; Brown et al., 2009; Dane, 2011; Ryan & Deci, 2008). Due to dispositional tendencies, research has found that some people may be in a mindful state of consciousness more often than others (e.g., Baer, Smith, & Allen, 2004; Giluk, 2009; Walach et al., 2006).

Mindfulness has been operationalized a number of ways. For example, the Five Facet Mindfulness Questionnaire (FFMQ) defines mindfulness as having five facets, which were discovered via exploratory factor analysis of other mindfulness measures. The facets in the FFMQ include observation of sensations, thoughts, feelings, and perceptions (observing), skills in describing this inner experience with words (describing), the ability to act with awareness and concentration rather than performing daily activities thoughtlessly or being on autopilot (acting with awareness), being nonjudgmental of one's experience (nonjudging), and being nonreactive to one's experience (nonreacting; Johns, Allen, & Gordon, 2015). State mindfulness differs from trait mindfulness in that it refers to being mindful in the present moment, which may potentially change from moment to moment, whereas trait mindfulness is the tendency to be mindful across situations.

Trait mindfulness has been associated with numerous positive factors related to general health, mental health, and life satisfaction. Indeed, trait mindfulness has been negatively associated with psychological distress, rumination, and social anxiety while positively correlated with clarity of emotional states, mood repair, and relationship satisfaction (Carmody et al., 2008; Chambers, Lo, & Allen, 2008; Dekeyser et al., 2008). Increased mindfulness has been related to more positive interpersonal interactions

(Dekeyser et al. 2008), greater abilities in identifying and communicating emotions (Wachs & Cordova 2007; Johns et al., 2015), regulating anger, and increasing empathic concern and perspective taking (Block-Lerner et al., 2007; Dekeyser et al. 2008; Wachs and Cordova 2007). Focusing on improving one's level of mindfulness would thus be beneficial for individuals with behavior regulation difficulties and difficulties in conveying emotions. Individuals with higher levels of trait mindfulness are thought to be able to view aversive experiences as being transient rather than as experiences that should be avoided or acted upon (Kabat-Zinn 2003; Karyadi & Cyders, 2015). A mindful person is able to acknowledge and attend to his or her current emotional or physical experience, and also remain unattached and accept the experience nonjudgmentally with the knowledge that it is transient (Johns et al., 2015). Therefore, individuals who are mindful are more likely not to dwell upon the presence or potential presence of aversive events, and are able to accept the existence of such events. It would be expected that those who are manipulative, vengeful, and have behaviour regulation difficulties may find it difficult to be mindful due to their focus on acting upon negative events or impulses.

### **Alexithymia**

The term alexithymia (a = lack, lexis = word, thymos = emotion) was established by Peter Sifneos (1973) to describe a group of patients who could not verbalize their emotions, with about 10% of the general population characterized by alexithymia (Bird & Viding, 2014; Wastell & Booth, 2003). A good operational definition of alexithymia is lacking, with much of the work on the construct coming from the psychoanalytic tradition (Jonason & Krause, 2013). It is the more recent conceptualizations of the construct that comes from the socio-cognitive tradition, with alexithymia considered to have three parts

(Bagby, Parker, & Taylor, 1994). Alexithymia refers to a set of interconnected difficulties in identifying and distinguishing between feelings and bodily sensations of emotional arousal, describing feelings (especially to other people), and externally oriented thinking (Taylor, Bagby, & Luminet, 2000). Moreover, those with alexithymia show a stimulus-bound externally-oriented cognitive style with constricted imaging processes, such as a lack of fantasies (Bagby et al. 1994; Teixeira & Pereira, 2015). The inability to identify and distinguish emotions applies to both positive and negative emotions. Those with alexithymia have difficulties using appropriate words to express, describe, and differentiate feelings from bodily sensations of emotional arousal, with such difficulties occurring for both positive and negative emotions (Haviland et al., 2004). Their interpersonal relationships are often effected by their lack of understanding of their emotions and the emotions of others.

The physiological underpinnings of alexithymia were described by Krystal (1988) with a focus on the lack of reflective self-awareness exhibited by individuals. It is believed that the connection between the self-referential meaning of an emotional stimulus and its physiological origins is severed (Krystal, 1988). More specifically, those with alexithymia experience feelings as vague and undifferentiated physical sensations to the extent that they often cannot distinguish whether they are sad, tired, hungry, or ill, rather than utilizing physiological arousal as a signal to the self that one is experiencing an emotion (Krystal, 1988; Wastell & Booth, 2003). More specifically, alexithymia has been associated with elevated sympathetic activity (Linden, Wen, & Paulhus, 1995). Given their difficulty in identifying feelings and distinguishing between feelings and the bodily sensations that accompany states of emotional arousal, individuals higher in



alexithymia are considered prone to functional somatic symptoms (Taylor, Bagby, & Parker, 1997; Taylor et al., 2000). The emotion regulation deficits of those with alexithymia have been associated with various medical and psychiatric illnesses, such as gastrointestinal disorders, posttraumatic stress, and eating disorders (Haviland et al., 2004). Alexithymia has been found to be negatively associated with emotional intelligence (EI), which refers to people's self-perceptions of their emotional abilities (Petrides et al., 2011). EI has been positively linked with general health, mental health, and life satisfaction, with low levels of EI associated with psychopathology (Petrides et al., 2011). As EI and alexithymia both include the ability or inability to identify emotions in the self, respectively, both constructs are of interest for the present study. Moreover, as EI also includes the ability to identify the emotions of others, identifying EI will allow for a better understanding of how emotions of the self and others are associated with the other constructs of interest. It has been suggested that the primary impairment in alexithymia is within the affective representation system, which provides a representation of the current affective state of the self, with this impairment likely to impact empathy processing (Bird & Viding, 2014). Empathy is a social awareness through which a person shares an emotional experience with others on an affective and/or cognitive level (Davis, 1994; Wai & Tiliopolous, 2011). Given the difficulties in identifying and describing emotions in alexithymia, it would be expected that those with alexithymia also have difficulty engaging in an empathetic nature. It is important to note that alexithymia may not always be viewed as a negative tendency to have, as being distant from emotions at times is necessary. For instance, first responders and certain medical professionals must

prevent themselves from overly empathizing with the feelings of others at times, as focusing on emotions can result in compassion fatigue over time.

Several longitudinal studies have yielded strong support for alexithymia being a stable trait that is independent of psychological distress or other effects of a medical or psychiatric illness. A group of patients with anxiety and depressive disorders were followed and it was found that the mean Toronto Alexithymia Scale (TAS) score was unchanged after one year, despite a significant decrease in the mean score on a measure of psychological distress (Taylor et al., 2000; Salminen et al., 1994). In a study of newly abstinent alcoholic patients, Haviland and colleagues (1988) found no significant change in the mean TAS score over a three-week treatment period despite a significant drop in the mean score on the Beck Depression Inventory (BDI; Taylor et al., 2000). These findings thus indicate that, even when depressive symptoms improve, alexithymia remains consistent. Furthermore, this identifies alexithymia as an aspect of personality, as it is rather stable, is measured on a continuum, and differences between individuals.

The term “emotional intelligence” was first used by Salovey and Mayer (1990), who suggested that EI consists of the following three categories of adaptive abilities: appraisal and expression of emotion, regulation of emotion, and utilization of emotions in solving problems (Schutte et al., 1998). Mayer and Salovey (1997) postulated a revised model of EI consisting of the following four branches: perception, appraisal and expression of emotion, emotional facilitation of thinking, understanding, analyzing and employing emotional knowledge, and reflective regulation of emotions to further emotional and intellectual growth (Schutte et al., 1998). The appraisal of self and others’ emotions, regulation of emotion, and use of emotion have also been reported among individuals

with higher dispositional mindfulness (Bao, Xue, & Kong, 2015). Brown and colleagues (2007) postulated the association of dispositional mindfulness and EI as due to mindfulness adding “clarity and vividness to current experience and encouraging closer, moment-to-moment sensory contact with life” and “enhancing self-regulated functioning that comes with ongoing attentional sensitivity to psychological, somatic and environmental cues” (Wang & Kong, 2014). Therefore, mindfulness may allow individuals to accurately perceive their own and others’ emotions and effectively regulate emotions (Wang & Kong, 2014). Among a sample of adult twin pairs, EI has been positively associated with narcissism, but negatively associated with Machiavellianism and psychopathy (Cairncross et al., 2013; Petrides et al., 2011; Veselka et al., 2012). Moreover, Nagler and colleagues (2014) also found the aforementioned association of Dark Triad traits and EI. These findings suggest that that individuals scoring high on measures of Machiavellianism and psychopathy tend to exhibit a deficient ability to express and understand emotional information, whereas individuals scoring high on measures of narcissism appear to be socially aware and adept at perceiving clearly their own emotions as well as the emotions of others (Veselka et al., 2012).

### **The Dark Triad**

The Dark Triad consists of psychopathy, Machiavellianism, and narcissism. Psychopathy is characterized by limited emotional insight, callousness, low empathy and anxiety, lack of self-control, recklessness, thrill-seeking, and anti-sociality (Jones & Paulhus, 2014; Paulhus & Williams, 2002). A distinction has been made between primary and secondary psychopathy, with primary psychopathy characterized by fearlessness, poor passive avoidance, and average levels of positive and negative emotionality, and

secondary psychopathy characterized by relatively high levels of positive and negative emotionality, impulsiveness, antisociality, and sensation seeking (Newman et al., 2005). It is noteworthy to identify the distinction between the types of psychopathy, in order to identify that certain characteristics are often endorsed together more so than other characteristics are among those higher in psychopathy. Machiavellianism refers to lack of morality, manipulateness, and cynical views (Jones & Paulhus, 2014). Christie and Geis (1970) identified those high in Machiavellianism as those with a lack of interpersonal affect in interpersonal relationships, concern with conventional morality, gross psychopathology, and low ideological commitment (McHoskey et al., 1998). Narcissism is characterized by attention-seeking, extreme vanity, artificially inflated sense of self, and exploitativeness in interpersonal relationships (Jakobwitz & Egan, 2006). Individuals high in psychopathy act impulsively, abandon friends, and family, and pay little attention to their reputations (Hare & Neumann, 2008), whereas individuals high in Machiavellianism plan ahead, build alliances, and do their best to maintain a positive reputation (Jones & Paulhus, 2014). The construct of Machiavellianism emerged from Richard Christie's selection of statements from Machiavelli's original books (Christie & Geis, 1970). Research in this area showed that respondents who agreed with these statements were more likely to behave in a cold and manipulative fashion in laboratory and real world studies (Christie & Geis, 1970; Paulhus & Williams, 2002). Raskin and Hall's (1979) attempt to delineate a subclinical version of the DSM-defined personality disorder led to the construct of subclinical narcissism (Paulhus & Williams, 2002). The adaptation of psychopathy to the subclinical sphere is the most recent of the three components of the Dark Triad (Hare, 1985; Lilienfeld & Andrews, 1996; Paulhus &

Williams, 2002). Central character elements include high impulsivity and thrill-seeking along with low empathy and low anxiety. The three traits have been found to overlap in characteristics, thus their distinctiveness can be clarified when studied together (Jones & Paulhus, 2014). Paulhus and Williams (2002) coined the term Dark Triad to encourage researchers to study the three traits in tandem for this reason. Given the high competitiveness typically reported by individuals high in the Dark Triad traits (Jonason et al., 2010), individuals characterized by the Dark Triad traits may view another's misfortune more favorably as it positions them closer to achieving their own goals (James et al., 2014). Although extreme forms of the Dark Triad traits may be found among some individuals, varying and often lower degrees of these traits are found amongst everyone in the population, and can even result in a social advantage (Jakobwitz & Egan, 2006). Specific cut-offs have not been identified in the literature; rather, individuals report levels of the traits along a continuum, with some reporting lower or higher levels. Men have been found to report higher levels of the Dark Triad traits (Paulhus & Williams, 2002). These differences may be due to biological processes, as men may have a tendency to engage in certain behaviours more so than women, such as risk-taking behaviours. Gender differences may also be due to social processes, as women may engage in certain behaviour more than men, such as focusing on one's admiration by others due to social norms of the importance of appearance of women.

The successful manipulator, as is one who is high in Machiavellianism, was conceptualized by Christie and Geis (1970) as someone devoid of affective attachments to others, with intact reality, who would be willing and able to manipulate others (McHoskey et al., 1998). Thus, Christie's original conceptualization of the individual

high in Machiavellianism includes characteristics that are key to defining psychopathy, specifically, affective detachment, callousness, intact reality, and manipulateness (Furnham et al., 2013; McHoskey et al., 1998). Individuals high in Machiavellianism and secondary psychopathy tend to report high levels of anxiety (Fehr et al., 1992; McHoskey et al., 1998), with Machiavellianism also associated with neuroticism (Ramanaiah, Byravan, & Detwiler, 1994; McHoskey et al., 1998). McHoskey and colleagues (1998) examined the association of Machiavellianism, as measured by the Mach-IV (Christie & Geis, 1970), and psychopathy, as measured by the primary and secondary psychopathy scales (Levenson et al., 1995). Their findings indicated that the Mach-IV is a global measure of psychopathy (McHoskey et al., 1998). Moreover, Hare (1991) demonstrated that Machiavellianism is moderately positively correlated with psychopathy's Factor 1, which reflects exploitation of others, but shows a quite low correlation with Factor 2, which assesses antisocial lifestyle, including impulsivity (Gustafson & Ritzer, 1995). It is important to note the difference between the two constructs, as Machiavellianism, unlike psychopathy, appears to be characterized by a less impulsive and aggressive way of life (Jones & Paulhus, 2011; Reidy et al., 2008).

Psychopathy has also been evidenced to overlap with narcissism, particularly with regards to exploitativeness, sense of entitlement, grandiose ideas, and lack of empathy. Gustafson and Ritzer (1995) conducted a study examining the conceptualization of aberrant self-promoters, which are individuals that display narcissistic and antisocial behaviours, as evidenced in psychopathy. These aberrant self-promoters reported higher scores on the Psychopathy Checklist (PCL-R) and committed more antisocial acts than individuals who were not aberrant self-promoters (Gustafson & Ritzer, 1995).

A manipulative nature is a key similarity between Machiavellianism and narcissism. This nature tends to be emphasized by emotional detachment in Machiavellianism and the inability to take the perspective of others in narcissism. It has been noted that narcissism and Machiavellianism share a similar location in the interpersonal circumplex, with love on the horizontal axis and dominance on the vertical axis (Bradlee & Emmons, 1992; Gurtman, 1991; McHoskey, 1995; Wiggins, 1979). The interpersonal circumplex is a construct of personality comprised of a vertical and horizontal intersecting line. The vertical line represents dominance, with the highest point on the line indicating the greatest level of dominance and the lowest point on the line indicating the lowest level of dominance. The horizontal line represents love/warmth, with the far left indicating the lowest level of warmth/love and the far right indicating the highest level of love/warmth. The two constructs fall within the upper left quadrant of the interpersonal complex, similarly indicating dominance, arrogance, and lack of interpersonal warmth (Bradlee & Emmons, 1992; Gurtman, 1991; McHoskey, 1995).

### **The Dark Triad and Alexithymia**

The extant literature has determined the prevalence of empathic impairment among those endorsing the Dark Triad traits, with most of the research examining the Dark Triad traits individually. Men score consistently higher than women on Dark Triad traits (Jonason & Webster, 2010) and alexithymia (Wastell & Booth, 2003; Wastell & Taylor, 2002), and lower on empathy (Baron-Cohen & Wheelwright, 2004). Both sexes utilize selfish and exploitative goal-directed strategies (Jonason & Krause, 2013; Jonason & Schmitt, 2012), but differential evolutionary needs may have created disparate underlying mechanisms behind these strategies, with varying levels of emotional

connectedness being required for men and women to achieve their goals. For instance, past research suggests that men may lack empathy through psychopathy and women may lack empathy through narcissism (Jonason & Krause, 2013; Jonason et al., 2013). These findings may represent different adaptive strategies, with men adopting a riskier approach, and women adopting a less risky approach (Jonason & Schmitt, 2012). Emotional deficiencies, such as a lack of empathy, are key characteristics of the Dark Triad traits. Empathy has been divided into two domains, with affective empathy concerning the tendency to “catch” emotions from the observed emotional states of others, and cognitive empathy concerning the ability to discern emotional states of others without undergoing emotional contagion (Wai & Tiliopoulos, 2012). A recent study found that the Dark Triad traits are associated with deficits in affective empathy, but no associations were found with cognitive empathy (Wai & Tiliopoulos, 2012). This finding thus indicates that those who report elevations in the Dark Triad traits lack the ability to be impacted by the emotions of others, which is understandable given that disregard for others is a key overlapping characteristic across the traits. Those characterized by the Dark Triad traits are unlikely to consider the emotions of the person experiencing a misfortune, and are likely to envision what they can gain from the situation, with a likely gain being a social influence tactic, such as a means of social comparison in order to influence those around them (James et al., 2014; Jonason & Webster, 2012). The literature suggests that alexithymia and elevated Dark Triad traits are present concurrently in individuals, rather than one being causal of another (Jonason & Krause, 2013).



Not surprisingly, aggression has been associated with deficits in empathy, with violence a characteristic of psychopathy (Wai & Tiliopoulos, 2012). It is believed that psychopathy and alexithymia are associated due to the lack of empathy evident in both. The literature has suggested that alexithymia and psychopathy are associated with difficulties in describing one's own feelings (Luminet et al., 1999), understanding emotional tones in language (Hervé et al., 2003), difficulties in interpreting facial expressions (Dolan & Fullam, 2006), and low scores on measures of trait EI (Grieve & Mahar, 2010; Malterer et al., 2008). Those with alexithymia have been found to exhibit uncontrolled and sometimes violent emotional outbursts, yet they cannot connect these outbursts to specific feelings (Krystal, 1979; Krystal, 1988; Haviland et al., 2004). Klitkangas-Jaervinen (1982) found some male prisoners who had been convicted of violent crimes to be alexithymic, as they were unable to fantasize or express imagined thoughts and emotions (Haviland et al., 2004). However, the overlap between psychopathy and alexithymia is not exceedingly prevalent among prisoners, as only two of 37 female prisoners were found to report elevations of both constructs in another study (Haviland et al., 2004; Louth, Hare, & Linden, 1998). Although research has indicated an overlap in alexithymia and psychopathy, the association may not always be identified in criminal samples due to the potential of individuals with psychopathy not admitting difficulties with emotions (Haviland et al., 2004; Kroner & Forth, 1995). The shared characteristics between psychopathy and alexithymia reflect disturbances in self and object relations, a lack of insight of one's own behavior and motives, and little capacity for warm and compassionate relationships with others (Haviland et al., 2004). However, the manifestation of both characteristics are different. Alexithymia and psychopathy

differ in the level of anxiety, dominance, impulsivity, and social conformity individuals report (Haviland et al., 2004). An exception to this, however, is that individuals with secondary psychopathy have the tendency to be anxious, similar to those with alexithymia. Primary psychopathy has been found to be negatively associated with attention to feelings, suggesting that these individuals exhibit a decreased tendency to pay attention to their own emotions (Malterer et al., 2008; Petrides et al., 2011). Secondary psychopathy was negatively associated with mood repair, suggesting that these individuals are less confident about regulating their moods and repairing negative emotions (Malterer et al., 2008). The researchers indicated that the findings infer that psychopathy may stem from core emotional deficits that create insensitivity to emotional information, as initially posited by Patrick and Lang (1999). Primary psychopathy and Machiavellianism were positively associated with the experience of positive affect from sad stimuli, whereas secondary psychopathy and Machiavellianism were positively associated with the experience of negative affect in response to neutral stimuli (Ali et al., 2009; Petrides et al., 2011).

Machiavellianism and alexithymia overlap in that individuals remain unmoved by emotional involvement with others and are indifferent towards their own beliefs or behaviours. Geis (1978) described the Machiavellian personality in a manner that is similar to description of alexithymia, including task- rather than people-oriented, and as dominated by emotional detachment from others and lacking in interpersonal warmth. Individuals high in Machiavellianism and alexithymia tend to be rationalistic and probabilistic in their outlook, as opposed to the more typically emotional and ethical orientation of those low in Machiavellianism and alexithymia (Christie & Geis, 1970).

With regards to emotions, the “cold” nature exhibited by individuals high in Machiavellianism is postulated to be due to the failure of these individuals to develop the ability to recognize and use emotion processes as social cues (Wastell & Booth, 2003). The superficiality of relationships that is evident in Machiavellianism is also prevalent in alexithymia, with individuals seeing others as highly replaceable, albeit also wanting attachment relationships (Wastell & Booth, 2003). The findings of Wastell & Booth (2003) indicate that individuals high in Machiavellianism lack the ability to identify feelings and exhibit an external orientation toward his or her experience.

Narcissism, unlike psychopathy and Machiavellianism, has been found to be negatively associated with alexithymia. A twin study conducted by Cairncross and colleagues (2013) found alexithymia to be positively associated with psychopathy and Machiavellianism, and negatively associated with narcissism. A possible explanation for this inverse association is the positive association that has been found between narcissism and EI, recalling that EI is negatively associated with alexithymia (Cairncross et al., 2013; Parker et al., 2001). Narcissism differentiates itself from the other Dark Triad traits in that it has been associated with cognitive empathy, which may be influenced by their need for admiration resulting in a better understanding of how others view them (Wai & Tiliopolous, 2011). Moreover, the self-report bias may influence a narcissist’s rating of their ability to read and understand the emotions of others, due to their sense of grandiosity and overestimation of self-abilities (Ames & Kammrath, 2004; Wai & Tiliopolous, 2011).

## **Mindfulness and Alexithymia**

Mindfulness and alexithymia are similar in that they involve attention to one's emotions and inner experiences, with mindfulness associated with the ability to engage in these activities, and alexithymia associated with difficulties in engaging in these activities. The concept of mindfulness can be contrasted with alexithymia to the extent that mindfulness encourages open curiosity and attentiveness to inner experiences and becoming familiar with the arising thoughts or feelings, in the body (De la Fuente et al., 2010; Gilbert et al., 2012; Teixeira & Pereira, 2015). Baer and colleagues (2004) examined the association between the different subscales of mindfulness and alexithymia. Alexithymia was negatively correlated with the describe and observe subscales, which is understandable given that alexithymia and mindfulness are both operationalized by describing emotions, and both constructs focus on attention to emotions (Baer et al., 2004). The act with awareness subscale score was not related to any of the alexithymia scores, perhaps suggesting that the ability to concentrate fully, with undivided attention, on the activity of the present moment is unrelated to the ability to identify and describe feelings (Baer et al., 2004). However, scores on the accept without judgment subscale were associated with the first two alexithymia scores, suggesting that those who have more trouble identifying and describing their feelings are likely to be less accepting of them (Baer et al., 2004).

Highly mindful individuals are said to be “in tune” with their emotions and highly capable of regulating them (Brown & Ryan 2003; Lyvers et al., 2014), compared to those with alexithymia who are not able to identify their emotions. The extant research has identified an association of alexithymia with low levels of mindfulness. A study by

Lyvers and colleagues (2014) found alexithymia to be associated with frontal lobe dysfunction, such as problems with inhibition and mental flexibility problems. This finding is noteworthy given that frontal lobe dysfunction is negatively related to mood self-regulation. Chambers et al. (2009) noted that self awareness and self-regulation of emotions are both linked to activity within the prefrontal cortex, a brain region essential for normal executive cognitive functioning. Mindfulness associates with the enhancement of top-down regulation, or an increase in the activation of the prefrontal cortex (PFC), which then modulates the activity of the limbic structures, such as the amygdala (Farb et al., 2007). Mindfulness is also associated with bottom-up regulation (Taylor et al., 2011), which involves becoming less reactive to the world, expressed by reduced amygdala activation without PFC modulation (Schirda et al., 2015).

A meta-analysis conducted by Cahn & Polich (2006) found that meditation in general, including mindfulness meditation, was associated with changes in the dorsolateral prefrontal area and the anterior cingulate cortex (Winning & Boag, 2015). Synthesising a range of neuroimaging and lesion studies, Shamay-Tsoory (2011) found that the same two areas, the dorsomedial prefrontal cortex area (adjacent to the dorsolateral prefrontal area), and the anterior cingulate cortex, were associated with cognitive empathy and affective empathy, respectively. Mindfulness has been associated with cognitive empathy, indicating the ability to discern emotional states of others without undergoing emotional contagion (Winning & Boag, 2015).

## **The Present Study**

As was previously noted, the existing body of literature has yet to investigate trait mindfulness among individuals high in the Dark Triad traits. Mindfulness has been associated with numerous benefits, including better physical and mental health, and those with the Dark Triad traits experience higher risk for poor health outcomes (Carmody et al., 2008; Chambers, Lo, & Allen, 2008; Dekeyser et al., 2008; Jonason et al., 2015). A component of mindfulness is identifying and focusing on one's emotions in the present moment, thus it is understandable that individuals with alexithymia report lower levels of mindfulness. Moreover, individuals who report symptoms and behaviours consistent with psychopathy and Machiavellianism have a greater likelihood of reporting alexithymia and lower EI, while those with elevations in narcissism symptoms have been found to not report alexithymia but report high EI. Identifying emotions, either an ability or an inability to do so, is a construct shared between mindfulness and the Dark Triad traits, respectively. It is therefore believed that alexithymia and EI may moderate the association between the Dark Triad traits and mindfulness, with the ability to identify emotions contributing to lower or higher levels of mindfulness. As alexithymia is high among individuals who report psychopathy and Machiavellianism, it is hypothesized that these individuals will also report lower levels of mindfulness, and as narcissism has been found to be negatively associated with alexithymia, it is hypothesized that those who score high in narcissism will have higher levels of mindfulness. Moreover, as EI is low among individuals who report psychopathy and Machiavellianism, it is hypothesized that these individuals will also report lower levels of mindfulness, and as narcissism has been

found to be positively associated with EI, it is hypothesized that those who score high in narcissism will have higher levels of mindfulness.

*Hypothesis 1a:* Psychopathy will be positively associated with alexithymia.

*Hypothesis 1b:* Psychopathy will be negatively associated with emotional intelligence.

*Hypothesis 1c:* Psychopathy will be negatively associated with trait mindfulness.

*Hypothesis d:* Alexithymia and emotional intelligence will moderate the negative association between psychopathy and trait mindfulness.

*Hypothesis 2a:* Machiavellianism will be positively associated with alexithymia.

*Hypothesis 2b:* Machiavellianism will be negatively associated with emotional intelligence.

*Hypothesis 2c:* Machiavellianism will be negatively associated with trait mindfulness.

*Hypothesis 2d:* Alexithymia and emotional intelligence will moderate the negative association between Machiavellianism and trait mindfulness.

*Hypothesis 3a:* Narcissism will be negatively associated with alexithymia.

*Hypothesis 3b:* Narcissism will be positively associated with emotional intelligence.

*Hypothesis 3c:* Narcissism will be positively associated with trait mindfulness.

*Hypothesis 3d:* Alexithymia and emotional intelligence will moderate the positive association between narcissism and trait mindfulness.

In summary, the aim of the present study is two-fold: (1) examine mindfulness among individuals high in the Dark Triad traits to gain a general understanding, determine how alexithymia and EI influence the association, and fill the gap in the literature and (2) examine the role of mindfulness as a potential area of focus to improve outcomes among individuals high in the Dark Triad traits. Such outcomes include ameliorating relationships with others and improving the ability to identify emotions, with further research potentially utilizing mindfulness training to achieve these improvements.



## CHAPTER III

### Methods

#### Participants

Demographic information of the sample is displayed in Table 1. A total of 246 participants completed the study (81% female). The proposed study was conducted via recruitment of participants from the Department of Psychology's participant pool. This is an electronic system that allows full- and part-time undergraduate students enrolled in psychology and business courses to receive extra credit for their courses in exchange for research participation. The study was approved by the Research Ethics Board of the University of Windsor, and all students were provided informed consent prior to participation. Inclusion criteria required participants to be able to read, write, and speak English. No other exclusionary criteria were used.

Of the 246 participants, 200 were female, 42 were male, two were gender-fluid, and two did not give a response. With regards to ethnicity, 6.1% were Asian or Asian descent, 4.1% were Southeast Asian, 0.8% were Hispanic/Latino, 5.3% were non-Hispanic Black or African descent, 54.5% were non-Hispanic White, Caucasian, or European descent, 13.4% were Arab or Middle Eastern descent, 6.1% were an Other/Mixed descent, and 2.4% preferred not to answer. There was a rather equal number of participants from each year of study, with 26% in their first year, 22.8% in their second year, 23.6% in their third year, 19.5% in their fourth year, and 7.7% in their fifth year or above. With regards to experience with mindfulness or meditation, 61.8% reported no prior experience, 16.3% reported highly variable experience, 16.3% reported 6 months or less and 3 or fewer time per week every week, 1.2% reported 6 months or

less and at least 4 times per week every week, 3.3% reported more than 6 months of experience and 3 or fewer times per week ever week, and 1.2% reported more than 6 months of experience and at least 4 times per week ever week.

## **Procedure**

The session was completed online, and the participant was asked to provide informed consent before beginning the study. They were told that they would be completing a series of questionnaires, the session would last up to 1 hour, and that they would receive one psychology or business course bonus point. Participants were allowed to take breaks in between the questionnaires as needed. No contact was made with participants following successful completion of the study.

The minimal risk of participation, as well as potential benefits (e.g., gaining course credit and learning more about the research process) were explained to the participants. After consent was obtained from all participants, a demographic questionnaire and additional questionnaires were administered, as described below.

## **Measures**

**Demographic information.** Demographic information was collected via a form to be filled out by all participants. Demographic questions were constructed for the present study, collecting information regarding participants' age, date of birth, gender, ethnicity, marital status, education level, and academic standing.

**Five-Facet Mindfulness Questionnaire (FFMQ).** The FFMQ is a self-report measure of the five facets of trait mindfulness, which include Observing, Describing, Acting, Non-judging, and Non-reactivity (Baer et al., 2006). Observing refers to noticing and paying attention to internal and external stimuli (e.g., "I notice the smells and aromas

of things”). Describing refers to the individual labelling internal experiences with words (e.g., “I am good at finding words to describe my feelings”). Acting with awareness includes attending to one’s tasks or activities in the present moment (e.g., “I find myself doing things without paying attention” (R)). Non-judging of inner experience refers to taking a non-judgemental or non-evaluative view on one’s thoughts and feelings (e.g., “I think some of my emotions are bad or inappropriate and I should not feel them” (R)). Non-reactivity to inner experience includes the individual letting thoughts come and go without getting caught up in the thoughts (e.g., “I perceive my feelings and emotions without having to react to them”). Levels of reported trait mindfulness are normally-distributed (Van Dam, Earleywine, & Borders, 2010). There are 39 items on the FFMQ, with responses indicated on a Likert scale ranging from 1 (never or very rarely true) to 5 (very often or always true). According to the authors, the scales for each of the five factors were created by selecting the seven or eight items with the highest loadings on their respective factors and low loadings on all other factors (Baer et al., 2008). The authors of the measure have reported that the five facet scales have demonstrated adequate to good internal consistency, with alpha coefficients ranging from 0.75 to 0.91 (Baer et al., 2008). Good reliability was also found for the present study, with an alpha coefficient of 0.85 found for the describe subscale, the subscale of interest.

**The Short Dark Triad (SD3).** The SD3 is a self-report measure of three traits: Machiavellianism (e.g., “Make sure your plans benefit you, not others), narcissism (e.g., “I get bored hanging around with ordinary people”), and psychopathy (e.g., “I’ll say anything to get what I want”). These behaviours include manipulating others, needing to be in the center of attention, and revenge seeking. It was anticipated that these behaviours

would be at very low levels in our participants, as they are university students. The Dark Triad traits have been found to be either normally- or non-normally distributed in different samples of the population (Stead et al., 2010). As prior studies of the Dark Triad traits have utilized a non-clinical university sample and have garnered results (Jonason et al., 2009; Jones & Paulhus, 2011), a university sample was also chosen for the present study. Items were selected on the basis that similar instances of callous manipulation would be evident in all three Dark Triad traits, and the three traits also exhibit unique behavior (Jones & Paulhus, 2014). The measure was created as a valid and reliable short measure of the Dark Triad (Jones & Paulhus, 2014). This 27-item measure includes nine items for each of the three personality constructs, and is rated on a Likert scale, with possible responses ranging from 1 (disagree strongly) to 5 (agree strongly). The measure is reported to have adequate concurrent validity and external validity (Jones & Paulhus, 2014). The authors of the scale also reported adequate reliabilities for narcissism ( $\alpha = 0.71$ ), Machiavellianism ( $\alpha = 0.77$ ), and psychopathy ( $\alpha = 0.80$ ; Jones & Paulhus, 2014). In the present study, adequate reliabilities were also found for narcissism ( $\alpha = 0.72$ ), Machiavellianism ( $\alpha = 0.79$ ), and psychopathy ( $\alpha = 0.72$ ).

**Toronto Alexithymia Scale (TAS-20).** The TAS-20 is a self-report measure of alexithymia, including difficulty identifying feelings, difficulty describing feelings, and externally-oriented thinking, with ratings normally-distributed in the population (Bagby et al., 1994). The TAS-20 is a 20-item measure, with responses rated on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The measure has been found to yield good test-retest reliability, internal consistency, and validity (Bagby et al., 1994). Difficulty identifying feelings is identified by questions such as “I have feelings that I

can't quite identify" and "I often don't know why I am angry." Difficulty describing feelings is examined by questions such as "It is difficult for me to reveal my innermost feelings even to close friends" and "It is difficult for me to find the right words for my feelings." Externally oriented thinking is identified by such questions as "Being in touch with emotions is essential" and "I prefer talking to people about their daily activities rather than their feelings." The authors of the TAS-20 have reported the measure to be stable and replicable across clinical and nonclinical populations (Bagby et al., 1994). High coefficient alphas have been obtained for the TAS-20 across samples, indicating excellent internal consistency (Bagby et al., 1994). Good reliability was also found for the present study ( $\alpha = 0.84$ ).

**Emotional Intelligence Scale (EIS):** The EIS is a self-report measure of emotional intelligence. The measure identifies appraisal and expression of emotion, regulation of emotion, and utilization of emotions in solving problems, such as "I am aware of the nonverbal messages I send to others" and "I easily recognize my emotions as I experience them." EI is a construct that is normally- and non-normally distributed in the population (Carr, 2009; Schutte et al., 1998). This 33-item measure has responses that are rated on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The measure was created via a principal-component factor analysis of a 62-item measure of EI. Authors of the measure have reported adequate test-retest reliability, with a Cronbach's alpha of 0.78. Moreover, authors reported good validity and internal consistency, with a Cronbach's alpha of 0.90 (Schutte et al., 1998). Good reliability was also found for the present study ( $\alpha = 0.88$ ). As would be expected, higher scores on the

scale have been associated with lower scores of alexithymia, as measured by the TAS ( $r = -0.65$ ; Schutte et al., 1998).

## CHAPTER IV

### Results

Descriptive statistics for the predictor, moderator, and outcome variables are displayed in Table 2. SPSS Statistics Version 22 was utilized to conduct the statistical analyses.

#### **Assumptions of linear regression**

In order to assess the validity of the results, violations of the assumptions of multiple regression analyses were checked. The assumptions of multiple regression analysis include adequacy of sample size, normality of distribution, a lack of multicollinearity, non-homoscedasticity, and independence of observations.

Sample size is the assumption that the sample is large enough in order to be able to identify a statistically significant difference if a difference does indeed exist. Generally, at least 15 observations per predictor are needed to meet the assumption (Pituch & Stevens, 2015). The sample size of 246 participants thus meets the assumption of adequate sample size.

Multiple regression assumes the absence of outliers and influential observations. No cases were found to be outliers on Y, with standardized residuals  $< |3.29|$  (Tabachnick & Fidell, 2001). After removal of data for participants who answered three or more validity questions incorrectly, Mahalanobis distance scores indicated outliers on X for one participant, with a cut-off of 25.82 ( $df = 5; p = 0.01$ ). As the outlier score for this participant was well above the cut-off (60.26), data corresponding to the participant was removed. No influential observations were found, with Cook's  $d$  values less than 1.0 (Cohen et al., 2003).

Normality was assessed by examining skewness ( $< |2|$ ) and kurtosis ( $< |3|$ ) values of all variables included in the regression analyses. Values of skewness and kurtosis were within the adequate range for all variables. Histograms of the variables and q-q plots also indicated a normal distribution for all variables. More specifically, all of the variables in the present study were normally distributed. In order to assess the assumption of linearity, scatterplots were created to identify the pattern of association between the predictor variables and outcome variables. Visual inspection of the scatterplots indicated that the associations were linear.

Multicollinearity was assessed by examining the correlations between the predictor variables included in the regression analyses. Intercorrelations between the predictor variables ranged from 0.16 to 0.56, thus did not indicate multicollinearity (Pituch & Stevens, 2015). Collinearity diagnostic tests yielded tolerance values  $> 0.1$  (range: 0.75 to 0.96 (Machiavellianism); 0.64 to 0.83 (narcissism); 0.75 to 0.97 (psychopathy)), and Variance Inflation Factor (VIF) values  $< 10$  (range: 1.04 to 1.33 (Machiavellianism); 1.23 to 1.57 (narcissism); 1.03 to 1.33 (psychopathy); Pituch & Stevens, 2015). The variables thus demonstrate an absence of multicollinearity.

Homoscedasticity of errors refers to the assumption that error variances are equal across predicted values of the independent variables (Cohen et al., 2003). This assumption was tested by plotting the residuals against the predicted values for each of the predictor variables. Visual inspection of the plots did not indicate violations of the assumption. The Durban Watson statistic was calculated to identify the independence of errors, with a value between 1.5 to 2.5 for all regression analyses (Machiavellianism: 2.08; narcissism: 2.07; psychopathy: 2.03). Another assumption is measurement of



variables without error. Cronbach's alpha was calculated to determine internal consistency of items of the study measures (see Table 2). All values of internal consistency were "good" for each of the scales, with Cronbach's alpha coefficients of 0.83 (SD3), 0.84 (TAS-20), and 0.88 (EIS and FFMQ).

Multiple regression also assumes independence of observations. As the variables measured are rather static personality traits, it would be expected that values provided by participants are influenced by their personality and beliefs. Therefore, values would not be expected to be influenced by the potential interaction of participants in courses.

### **Data Analyses**

A power analysis was conducted using G Power, indicating the need for 253 participants in order to identify a small effect size. Nine validity questions were embedded throughout the questionnaires. These included items such as "if you are reading this, select 'agree,'" and "there are 14 months in a year, select 'strongly disagree.'" Approximately 95% people answered no more than two validity questions incorrectly. Therefore, three or more incorrect answers to these questions was used as a cut-off for inclusion in the study. In doing so, all of the data for 13 individuals were excluded from the analyses. The distribution of these responses is depicted in Figure 1.

Following the removal of data likely to be invalid, the missingness of data was considered. Across the dataset, 2.31% of the data were missing. Little's Missing Completely at Random (MCAR; Little, 1988) test was utilized to determine if values were missing completely at random, with the data being MCAR as the null hypothesis. The test was found to be non-significant for SD3 ( $\chi^2 = 174.53$ ,  $df = 267$ ,  $p = 1.00$ ), EIS ( $\chi^2 = 439.68$ ,  $df = 451$ ;  $p = 0.64$ ), and FFMQ ( $\chi^2 = 953.35$ ;  $df = 1110$ ;  $p = 1.00$ ); thus the

data was missing completely at random. The MCAR test was significant for TAS-20 ( $\chi^2 = 196.18$ ;  $df = 159$ ,  $p = 0.02$ ), although visual inspection of the data indicated that the data was missing at random. For the TAS-20, missing values were calculated as per the guidelines of the authors of the measure, with the missing value calculated as the individual's mean score on that factor (Bagby et al., 1994). The missing values of the remaining measures were calculated via multiple imputation, using five iterations. Although men tend to report higher levels of the Dark Triad traits, some studies have not found gender differences in findings (Paulhus & Williams, 2002), thus gender was not included in the analyses of the present study.

Three separate stepwise regression analyses were conducted. Scores on the SD3 were summed by trait, with each individual obtaining a score for each of the three traits. Each Dark Triad trait (Machiavellianism, narcissism, and psychopathy) was entered as the predictor variable in the stepwise regression analyses, alexithymia (as measured by the TAS-20) and EI (as measured by the EIS) were entered as moderators, and mindfulness was entered as the outcome variable. The outcome variable was a subscale score of trait mindfulness, with a score calculated for describing, as this subscale has been associated with the three components of alexithymia (Baer et al., 2004). In the first block, the Dark Triad variable, alexithymia, and emotional intelligence were entered. In the second block, the interaction terms of the Dark Triad variable and alexithymia, and the Dark Triad variable and emotional intelligence were entered.

In order to gain a greater understanding of the findings, other results have been reported in Tables 4 to 9, as the utility of interpreting other coefficients along with  $\beta$  weights has been noted (Courville & Thompson, 2001). These results include partial

correlations (the proportion of variance in the outcome variable that is attributable to a given predictor and not accounted for by other predictors; Cohen et al, 2003) and semipartial correlations (the proportion of variance in the outcome variable that is attributable to a given predictor; Cohen et al, 2003). As multiple imputations were used, the pooled results provided by SPSS were used in reporting findings. However, pooled results were not provided for adjusted R-squared values and  $\beta$  weights, thus the mean values across imputations were calculated, and a range is provided for cases that do not have the same values across imputations.

### **Psychopathy**

As was predicted, psychopathy was significantly, positively correlated with alexithymia ( $r = 0.16$ ;  $p = 0.01$ ) and significantly, negatively correlated with emotional intelligence ( $r = -0.14$ ;  $p = 0.03$ ). Contrary to preliminary hypotheses, psychopathy was not significantly correlated with trait mindfulness ( $r = -0.02$ ;  $p = 0.37$ ).

The hierarchical regression model accounted for 54% of the variance in mindfulness ( $R^2_{adj} = 0.53$ , range = 0.533 to 0.536). In the first block of the regression analysis, psychopathy and alexithymia significantly predicted mindfulness ( $R^2_{adj} = 0.54$ ). Contrary to predictions, alexithymia and EI did not act as moderators, as these predictors did not increase the amount of variance in mindfulness accounted for by the model when entered as moderators ( $\Delta R^2 = 0.00$ ;  $F_{change}(2, 240) = 0.09$ ;  $p = 0.92$ ). Although psychopathy was not significantly correlated with mindfulness, it accounted for unique variance in the outcome variable in the regression model ( $\beta = 0.10$ ;  $p = 0.02$ ; CI = 0.19 to 2.08), being the predictor with the second greatest weight in predicting mindfulness. Alexithymia was the predictor with the greatest weight in predicting mindfulness

( $\beta = -0.70$ ;  $p < 0.001$ ; CI = -0.45 to -0.34), and EI was not found to be a significant predictor of mindfulness ( $\beta = 0.08$ ;  $p = 0.10$ ; CI = -0.005 to 0.08).

In order to gain a deeper understanding as to why psychopathy was not significantly correlated with mindfulness, but emerged as a significant predictor of mindfulness in the regression model, a regression analysis was conducted with psychopathy as the only predictor variable and mindfulness as the outcome variable. In this regression model, psychopathy was not found to be a significant predictor of mindfulness ( $R^2_{adj} = -0.004$ ;  $\beta = -0.02$ ;  $p = 0.74$ ; CI = -1.58 to 1.12). This finding, in conjunction with the results of the original regression analysis, suggests that psychopathy is a suppressor in the original regression model. Psychopathy therefore increased the adjusted R-squared in the original regression model due to its shared variance with the other predictor variables rather than mindfulness (Cohen et al., 2003).

### **Machiavellianism**

As was predicted, Machiavellianism was significantly, positively correlated with alexithymia ( $r = 0.18$ ;  $p = 0.003$ ). Machiavellianism was significantly, negatively correlated with mindfulness ( $r = -0.14$ ;  $p = 0.02$ ) and significantly, negatively correlated with emotional intelligence ( $r = -0.15$ ;  $p = 0.02$ ).

The hierarchical regression model accounted for 53% of the variance in mindfulness ( $R^2_{adj} = 0.53$ , range = 0.525 to 0.527). In the first block of the regression analysis, alexithymia was the only variable that significantly predicted mindfulness ( $R^2_{adj} = 0.53$ ). Contrary to predictions, Machievellianism was not a significant predictor of mindfulness ( $\beta = 0.00$ ;  $p = 0.96$ ; CI = -0.78 to 0.83). Also contrary to predictions, alexithymia and EI did not act as moderators, as these predictors did not increase the

amount of variance in mindfulness accounted for by the model when entered as moderators ( $\Delta R^2 = 0.02$ ;  $F_{change}(2, 240) = 0.53$ ;  $p = 0.62$ ). Alexithymia was a significant predictor of mindfulness ( $\beta = -0.69$ ;  $p < 0.001$ ; CI = -0.44 to -0.33) and the predictor with the greatest weight in predicting mindfulness, but EI was not a significant predictor ( $\beta = 0.08$ ;  $p = 0.12$ ; CI = -0.01 to 0.08).

In order to gain a better understanding of the role of Machiavellianism in predicting mindfulness, a separate regression analysis was conducted entering Machiavellianism in the first block, EI in the second block, and alexithymia in the third block, with mindfulness as the outcome variable. In the first block, Machiavellianism was a significant predictor of mindfulness ( $R^2_{adj} = 0.015$ ;  $\beta = -0.14$ ;  $p = 0.03$ ; CI = -2.37 to -0.11). However, in the second block Machiavellianism was no longer a significant predictor of mindfulness ( $R^2_{adj} = 0.16$ ;  $\Delta R^2 = 0.15$ ;  $F_{change}(1, 243) = 43.83$ ;  $p < 0.001$ ;  $\beta = -0.08$ ;  $p = 0.18$ ; CI = -1.77 to 0.33), and EI was a significant predictor ( $\beta = -0.39$ ;  $p < 0.001$ ; CI = 0.12 to 0.22). In the third block, Machiavellianism was not a significant predictor of mindfulness ( $R^2_{adj} = 0.53$ ;  $\Delta R^2 = 0.36$ ;  $F_{change}(1, 242) = 118.60$ ;  $p < 0.001$ ;  $\beta = -0.003$ ;  $p = 0.95$ ; CI = -0.82 to 0.77), nor was EI a significant predictor of mindfulness ( $\beta = 0.08$ ;  $p = 0.11$ ; CI = -0.008 to 0.08), but alexithymia was a significant predictor ( $\beta = -0.69$ ;  $p < 0.001$ ; CI = -0.44 to -0.33). As Machiavellianism was no longer a significant predictor with the addition of EI and alexithymia in the model, alexithymia was the mediator of the association between Machiavellianism and mindfulness. Moreover, as EI no longer remains a significant predictor after the addition of alexithymia into the model, alexithymia is the variable most responsible for the association between Machiavellianism and mindfulness.

## Narcissism

As was predicted, narcissism was significantly, negatively correlated with alexithymia ( $r = -0.26; p < 0.001$ ). Narcissism was significantly, positively correlated with EI ( $r = 0.43; p < 0.001$ ) and mindfulness ( $r = 0.26; p < 0.001$ ).

The hierarchical regression model accounted for 53% of the variance in mindfulness ( $R^2_{adj} = 0.53$ , range = 0.528 to 0.530). In the first block of the regression analysis, alexithymia was the only variable that significantly predicted mindfulness ( $R^2_{adj} = 0.53$ ). Contrary to predictions, narcissism was not a significant predictor of mindfulness ( $\beta = 0.07; p = 0.14; CI = -0.25$  to  $1.71$ ). Also contrary to predictions, alexithymia and EI did not act as moderators, as these predictors did not increase the amount of variance in mindfulness accounted for by the model when entered as moderators ( $\Delta R^2 = 0.002; F_{change}(2, 240) = 0.52; p = 0.61$ ). Alexithymia was a significant predictor of mindfulness ( $\beta = -0.69; p < 0.001; CI = -0.44$  to  $-0.33$ ) and the predictor with the greatest weight in predicting mindfulness, but EI was not a significant predictor ( $\beta = 0.04; p = 0.44; CI = -0.03$  to  $0.06$ ).

In order to gain a better understanding of the role of narcissism in predicting mindfulness, a separate regression analysis was conducted entering narcissism in the first block, EI in the second block, and alexithymia in the third block, with mindfulness as the outcome variable. In the first block, narcissism was a significant predictor of mindfulness ( $R^2_{adj} = 0.06; \beta = 0.26; p < 0.001; CI = 1.47$  to  $3.95$ ). However, in the second block narcissism was no longer a significant predictor of mindfulness ( $R^2_{adj} = 0.16; \Delta R^2 = 0.10; F_{change}(1, 243) = 30.9; p < 0.001; \beta = 0.11; p = 0.08; CI = -0.16$  to  $2.43$ ), and EI was a significant predictor ( $\beta = 0.36; p < 0.001; CI = 0.10$  to  $0.21$ ). In the third block,

narcissism was not a significant predictor of mindfulness ( $R^2_{adj} = 0.53$ ;  $\Delta R^2 = 0.36$ ;  $F_{change}$  (1, 242) = 189.70;  $p < 0.001$ ;  $\beta = 0.07$ ;  $p = 0.17$ ; CI = -0.29 to 1.66), nor was EI a significant predictor ( $\beta = 0.05$ ;  $p = 0.32$ ; CI = -0.02 to 0.07), but alexithymia was a significant predictor ( $\beta = -0.68$ ;  $p < 0.001$ ; CI = -0.44 to -0.33). As narcissism was no longer a significant predictor with the addition of EI and alexithymia in the model, alexithymia is the mediator of the association between narcissism and mindfulness. Moreover, as EI no longer remains a significant predictor after the addition of alexithymia into the model, alexithymia is the variable most responsible for the association between narcissism and mindfulness.

## CHAPTER V

### Discussion

The present study examined the associations among the Dark Triad traits and mindfulness, including the roles of alexithymia and emotional intelligence as moderators in the model. The extant literature has yet to examine the association between the Dark Triad traits and mindfulness, thus making this a novel study. Based on the literature examining the associations among the Dark Triad traits, mindfulness, alexithymia, and emotional intelligence, the hypotheses of the present study were generated. It was hypothesized that:

- Higher scores of psychopathy would be positively associated with alexithymia, negatively associated with emotional intelligence, and negatively associated with mindfulness, with alexithymia and emotional intelligence moderating the latter association.
- Higher scores of Machiavellianism would be positively associated with alexithymia, negatively associated with emotional intelligence, and negatively associated with mindfulness, with alexithymia and emotional intelligence moderating the latter association.
- Higher scores of narcissism would be negatively associated with alexithymia, positively associated with emotional intelligence, and positively associated with mindfulness, with alexithymia and emotional intelligence moderating the latter association.



- In all of the models, alexithymia levels would be negatively associated with mindfulness levels and emotional intelligence levels would be positively associated with mindfulness levels.

Consistent with the current body of research, the Dark Triad traits were significantly and positively correlated with one another (Paulhus & Williams, 2002). However, the pattern of correlations observed in the present study are somewhat inconsistent than those reported by Paulhus and Williams (2002). For instance, in the present study, scores on psychopathy and Machiavellianism had the largest correlation (0.55), but in the study by Paulhus and Williams (2002), scores on psychopathy and narcissism had the largest correlation (0.50). As has been found in previous studies, alexithymia and emotional intelligence were strongly inversely correlated with one another (Parker et al., 2001; Schutte et al., 1997), which is understandable given the large overlap of the two constructs. Consistent with previous research (Brown et al., 2007; Teixeira & Pereira, 2013), alexithymia and emotional intelligence were found to be significantly correlated with mindfulness. Past research has reported emotional intelligence was associated with higher levels of dispositional mindfulness among adults (Bao, Xue, & Kong, 2015; Wang & Kong, 2014). It has been postulated that the close attention to one's psychological, somatic, and environment cues that is involved in mindfulness allows for greater self-regulation, including awareness and regulation of emotions (Brown et al., 2007; Wang & Kong, 2014). Therefore, dispositional mindfulness may allow individuals to accurately perceive their own and others' emotions and effectively regulate emotions (Wang & Kong, 2014). As alexithymia was found to be a predictor of mindfulness in each of the three regression models, further discussion of

alexithymia is provided below for each of the Dark Triad traits. It is important to note that, although some participants self-reported elevated levels of the Dark Triad traits, these elevations are not clinical and are in the expected range for university students.

### **Psychopathy**

As was predicted, higher scores of psychopathy were positively correlated with alexithymia and negatively correlated with emotional intelligence. These findings are consistent with the current body of literature, which has found that psychopathy may stem from core emotional deficits that create insensitivity to emotional information (Malterer et al., 2008; Patrick & Lang, 1999). The current findings are consistent with the twin study conducted by Cairncross and colleagues (2013), who also found psychopathy to be positively associated with alexithymia. Moreover, Petrides and colleagues (2011) found psychopathy to be negatively associated with emotional intelligence. It has been found that those high in psychopathy have difficulties in describing one's own feelings (Luminet et al., 1999) and understanding emotional tones in language (Hervé et al., 2003), which are deficits also found in alexithymia. It is, therefore, understandable that those in the present study that self-reported higher levels of psychopathy also reported elevated alexithymia, but lower scores on emotional intelligence. Although the Dark Triad measure in the present study did not distinguish between primary and secondary psychopathy, both primary and secondary psychopathy have been associated with alexithymia, albeit somewhat differently. More specifically, in primary psychopathy, individuals exhibit a decreased tendency to pay attention to their own emotions (Malterer et al., 2008; Petrides et al., 2011), while with secondary psychopathy, individuals are less

confident about regulating their moods and repairing negative emotions (Malterer et al., 2008).

In the linear regression model used in the present study, scores of psychopathy and alexithymia were predictors of mindfulness. However, the results must be interpreted while considering the small, non-significant correlation between psychopathy and mindfulness. Further regression analyses indicated that the association between scores of psychopathy and mindfulness in the regression model was due to the association of psychopathy levels with alexithymia levels, which is consistent with the body of literature. Therefore, levels of psychopathy were not associated with mindfulness, nor did they predict mindfulness levels. These findings thus indicate that the personality profile of those high in psychopathy does not influence the mindfulness of the individuals.

### **Machiavellianism**

As predicted, enhanced scores of Machiavellianism were positively correlated with alexithymia and negatively correlated with emotional intelligence. These findings are consistent with Geis' (1978) comparison of Machiavellianism and alexithymia, indicating that both pertain to task- rather than people-oriented individuals, and as dominated by emotional detachment from others and lacking in interpersonal warmth. Wastell and Booth (2003) found that those high in Machiavellianism lack the ability to identify feelings and exhibit an external orientation toward his or her experience. Moreover, Cairncross and colleagues (2013) also found Machiavellianism to be positively correlated with alexithymia. Consistent with the current findings, Petrides and colleagues (2011) found Machiavellianism to be negatively associated with emotional intelligence.

Novel findings of the present study indicate that those with higher self-reported scores of Machiavellianism reported lower levels of mindfulness. The linear regression model provided possible insight into the mechanism through which elevated levels of Machiavellianism could be associated with lower levels of mindfulness. In the linear regression model of the present study, alexithymia levels were found to be the only significant predictor of mindfulness. However, in conducting additional regression models, as described in the Results section, alexithymia was also found to be a mediator of the association between Machiavellianism and mindfulness. As those who reported higher levels of Machiavellianism also reported higher levels of alexithymia, and alexithymia was a strong predictor in the regression model, low levels of mindfulness may be due to a lack of attention to and awareness of emotions among those higher in Machiavellianism. The mediation effect observed between Machiavellianism levels and alexithymia levels is consistent with previous findings identifying the positive association between the two constructs, with both involving the inability to identify feelings (Cairncross et al., 2013; Wastell & Booth, 2003). It is therefore the difficulty in identifying and describing emotions that influences mindfulness among those higher in Machiavellianism. As clinical Machiavellianism involves limited emotional insight and a lack of empathy, and mindfulness involves the ability to attend to one's emotions, it is not surprising that the lower levels of mindfulness among those with higher levels of Machiavellianism are greatly influenced by alexithymia.

### **Narcissism**

As was predicted, higher scores of narcissism were negatively correlated with alexithymia and positively correlated with emotional intelligence, which is consistent

with past research (Cairncross et al., 2013; Parker et al., 2001; Petrides et al., 2011).

Clinical narcissism has been associated with cognitive empathy, which may be influenced by their need for admiration resulting in a better understanding of how others view them (Wai & Tiliopolous, 2011). More specifically, due to their greater sense of grandiosity and concern with how others view them, those higher in narcissism may be more adept at being able to identify and understand the emotions of others (Ames & Kammrath, 2004; Wai & Tiliopolous, 2011).

Those higher in narcissism reported enhanced levels of mindfulness in the present study, with this association yet to be examined in the literature. The linear regression model in the present study provided insight into a possible mechanism through which higher scores of narcissism are associated with greater mindfulness. In the linear regression model, alexithymia was found to be the only significant predictor of mindfulness. However, in conducting additional regression models, as described in the Results section, alexithymia was found to be a mediator of the association between higher scores of narcissism and elevated mindfulness. Therefore, those higher on narcissism are better able to attend to their emotions, in turn allowing them to possess higher levels of mindfulness. It is thus possible that individuals higher in narcissism are more attentive to environmental cues, which might be used in estimating what others think of them. The ability to attend to these cues may make them more attentive to physical and psychological cues as well, increasing their levels of mindfulness.

### **General Discussion**

For each of the three regression models, alexithymia was found to be a mediator of the Dark Triad traits and mindfulness. The strong mediation effect that was found for

each of the three Dark Triad traits supports the influential role of identifying, distinguishing, and describing one's emotions on the individual's mindfulness levels. Those with relatively elevated narcissism scores by self-report were better able to identify and describe emotions, whereas those relatively higher in psychopathy and Machiavellianism were less able to do so. These differences among the Dark Triad traits may be due to the nature of the individuals with regards to their relationships with others. Specifically, those with clinical levels of psychopathy and Machiavellianism are often hostile and unempathetic in their relationships with others, whereas those with significant narcissism, although exploitative, do not possess the hostile nature of the other traits (Paulhus & Williams, 2012; Rauthmann, 2012). Jonason and colleagues (2013) found that those high in psychopathy and Machiavellianism reported lower levels of agreeableness, a Big Five trait that reflects an individual's tendency to get along with others. Although narcissism was not significantly, positively correlated with agreeableness in the study by Jonason and colleagues (2013), it is noteworthy that the inverse relations between psychopathy and Machiavellianism further indicates the hostile nature common to these two Dark Triad traits, but not in narcissism.

It is also noteworthy to discuss potential reasons as to why alexithymia but not emotional intelligence was a predictor of mindfulness, particularly since they are inversely but strongly correlated constructs (Parker et al., 2001). A limitation in the literature noted by Parker and colleagues (2001) is the focus of emotional intelligence on the mental abilities concerning the awareness and cognitive processing of emotion. The measure of emotional intelligence used in the present study is based on Salovey and Mayer's (1990) definition of emotional intelligence, which includes appraisal and

expression of emotion, regulation of emotion, and utilization of emotions in solving problems. Although alexithymia and emotional intelligence are similar in measuring the ability to identify and describe emotions, emotional intelligence focuses more on the ability to utilize emotions in problem solving, thus measuring the individual's adaptability. It is therefore possible that alexithymia was a predictor and mediator, while emotional intelligence was not, due to the complex component of problem-solving involved in emotional intelligence. Specifically, this was due to the fact that the most influential components in the present model are the ability to identify and describe emotions in general. Although alexithymia and emotional intelligence are inversely similar, they are distinct in that emotional intelligence also focuses on the ability of individuals to utilize their emotions in social interactions, whereas the focus of alexithymia is solely on the ability to identify and describe emotions. Therefore, the ability to identify and describe emotions, as opposed to utilizing emotions, influences mindfulness levels among those reporting higher scores of the Dark Triad traits.

It has been found that mindfulness and self-regulation of emotions are both linked to activity within the PFC, an area of the brain also responsible for cognitive functioning, decision-making, and social behaviour (Chambers et al., 2009). An increase in the activation of the PFC then modulates the activity of the limbic structures, such as the amygdala, which is responsible for processing of emotions (Farb et al., 2007). It is thus possible that the PFC, in combination with the amygdala, contributes to the ability to identify emotions among those reporting higher scores in Machiavellianism and narcissism, in turn effecting their levels of mindfulness.

## **Limitations**

The most significant limitation of the present study was the use of a non-clinical research pool to gather data. All of our participants are currently enrolled in Psychology or Business courses in university, thus reflecting a specific subgroup in the larger population. Furthermore, our sample included a large proportion of female participants, which is consistent with samples collected in university populations. However, it has been found that men tend to report higher scores on Dark Triad traits (Jonason & Webster, 2010), lower scores on alexithymia (Wastell & Booth, 2003; Wastell & Taylor, 2002), and lower scores on empathy (Baron-Cohen & Wheelwright, 2004). Therefore, the present findings may in fact be an underrepresentation of the associations between alexithymia and the Dark Triad traits, and alexithymia and mindfulness, in turn underestimating the mediating effect between the Dark Triad traits and mindfulness. Replication of the study with a larger number of male participants outside of a university setting may identify potential greater associations between the Dark Triad traits and mindfulness due to differing levels of alexithymia. Moreover, this may also identify potential associations between elevated psychopathy and mindfulness via alexithymia, as past research suggests that men lack empathy through psychopathy (Jonason & Krause, 2013; Jonason et al., 2013).

The current study relied on self-reports of the variables of interest. As the Dark Triad traits may seem undesirable to report, some individuals may have underreported on the measure of these traits. Moreover, as those higher in narcissism tend to be grandiose in their ideas of themselves, they may have reported better abilities of identifying emotions and higher levels of mindfulness than they indeed possess. This is noteworthy,



especially since self-reported measures have been the common method among numerous past studies examining correlates of the Dark Triad traits (e.g., Jonason & Paulhus, 2011; Jonason et al., 2013). John and Robins (1994) found that those high in narcissism evaluated their performance in a managerial group-discussion task slightly more positively than their performance was evaluated by either the peers or the staff. However, this general self-enhancement effect was reduced by individual differences, as many reported realistically, while others under-reported performance (John & Robins, 1994). Therefore, although reliance on self-reports with this population may be somewhat of a limitation, past research has indicated that it is indeed a valid method.

### **Conclusion and Implications**

In considering the influence of emotions on the association between the Dark Triad traits and mindfulness, mindfulness-based training may aid in improving one's ability to pay attention to the present moment. More specifically, mindfulness-based training has been found to have numerous benefits, including improved emotion regulation, decreased anxiety, increased relationship satisfaction, and greater self-insight (Davis & Hayes, 2011). Increased mindfulness has also been associated with greater abilities in identifying and communicating emotions (Wachs & Cordova 2007; Johns et al., 2015), regulating anger, and increasing empathic concern and perspective-taking (Block-Lerner et al., 2007; Dekeyser et al. 2008; Wachs and Cordova 2007). As those with relatively elevated levels of psychopathy and Machiavellianism also reported elevated levels of alexithymia in the present study, focusing on one's emotions may improve their ability distinguish, identify, and describe their emotions. Mindfulness-based training may be utilized to learn to observe and describe the emotions that one is

experiencing, while maintaining a nonjudgmental stance. Although in the present study those with enhanced narcissism also reported lower levels of alexithymia, significant narcissism is characterized by a lack of empathy. Mindfulness-based training can be utilized to improve attention to emotions, improving one's ability to nonjudgmentally experience emotions and react to emotions. In turn, this could potentially decrease the unempathetic nature prominent in narcissism. As those higher in the Dark Triad traits are unlikely to consider the emotions of others when making decisions, with those relatively higher in psychopathy and Machiavellianism also finding it difficult to identify these emotions, improving one's level of mindfulness may increase empathy, improving their social relationships. As was previously noted, deficits in empathy are prominent among the Dark Triad traits (Baron-Cohen & Wheelwright, 2004), resulting in difficulties in relationships and a lack of emotional attachment in relationships. Moreover, as was also previously discussed, improving empathy is one of the positive results of mindfulness-based training (Winning & Boag, 2015), as individuals improve in their ability to identify their thoughts and emotions, in turn improving their ability to identify the emotions of others. Therefore, mindfulness-based training can be beneficial in improving empathy in individuals high in the Dark Triad traits. These benefits would be beneficial to the individual themselves, as increases in empathy would allow for more positive interactions with others and greater relationship satisfaction. These benefits would in turn be beneficial for those in the lives of the individual, such as family members, friends, colleagues, and clinicians, as the individual would be more compassionate and perspective-taking in their relationships. It is important to consider, however, that the improvement of social relationships via mindfulness-based training depends on whether

the individual would like to improve their relationship with others. For instance, as a component of psychopathy is anti-sociality, it is possible that an individual high in psychopathy would not want to improve their relationship with others, thus the use of mindfulness-based training may not be important to them. It has been noted that, although those high in Machiavellianism see others as highly replaceable, they desire attachment relationships (Wastell & Booth, 2003). Therefore, the implementation of mindfulness-based training may be most beneficial among individuals who wish to improve their emotional awareness and social relationships, in turn improving mindfulness levels. Moreover, it is important to consider that improving mindfulness levels among individuals high in the Dark Triad traits may provide them with the skills of increasing awareness of the emotions and potential thoughts of others, potentially using it to their advantage. More specifically, if they are more aware of the emotions of others, they can use the information to better manipulate the individual, thus using it to their advantage. Therefore, utilizing mindfulness-based training may be most beneficial, both to the individual and those who interact with the individual, for individuals who report somewhat elevated Dark Triad scores, rather than those who report extremely elevated scores. Those who report somewhat elevated scores may be more willing to seek change in themselves in order to improve their relationships with others, in turn less likely to use their new skills to the disadvantage of others.

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Table 1. Participant Demographics.

Categorical Variables		N	%
Gender	Female	200	81.30
	Male	42	17.07
	Fluid	2	0.81
	No response	2	0.81
Ethnic Background	Aboriginal	0	0
	Asian or Asian descent	15	6.1
	Southeast Asian	10	4.1
	Hispanic/Latino	2	0.8
	Non-Hispanic Black or African descent	13	5.3
	Non-Hispanic White, Caucasian, or European descent	159	54.6
	Arab or Middle Eastern descent	33	13.4
	Other/Mixed	15	6.1
	Prefer not to answer	6	2.4
	Year of Study	1	64
2		56	22.8
3		58	23.6
4		48	19.5
5+		19	7.7
No response		1	0.41
Relationship Status	Single	143	58.1
	In a romantic relationship (non-cohabiting)	84	34.1
	Married/Civil Union/Cohabiting	14	5.7
	Divorced/Separated and Single	3	1.2
	No response	2	0.8
	Employment	Full-time (including volunteer work)	16
Part-time (including volunteer work)		161	65.4
Not currently employed or volunteering		68	27.6
No response		1	0.41

		<i>N</i>	<i>%</i>
Overall GPA	Below 60	7	2.8
	60-70	56	22.8
	70-80	105	42.7
	80 or above	76	30.9
	No response	2	0.8
Major GPA	Below 60	8	3.3
	60-70	55	22.4
	70-80	103	41.9
	80 or above	77	31.3
	No response	3	1.2
Experience with mindfulness or meditation	No experience	152	61.8
	Highly variable	40	16.3
	6 months or less of experience, and 3 or fewer times per week every week	40	16.3
	6 months of experience or less, and at least 4 times per week every week	3	1.2
	More than 6 months of experience, and 3 or fewer times per week every week	8	3.3
	More than 6 months of experience, and at least 4 times per week every week	3	1.2
Continuous variable		<i>Mean (SD)</i>	<i>Range</i>
Age		20.89 (4.36)	17 - 61

Table 2. Descriptive Statistics.

	Mean (SD)	Range	Skewness	Kurtosis	$\alpha$	N <sub>items</sub>
Psychopathy	1.99 (0.54)	1.00 - 3.56	0.35	-0.64	0.73	9
Machiavellianism	2.83 (0.64)	1.22 - 4.78	0.05	0.21	0.79	9
Narcissism	2.86 (0.57)	1.44 - 5.00	0.18	0.16	0.72	9
Alexithymia	49.70 (10.44)	20.00 - 79.00	0.13	-0.23	0.84	20
Emotional Intelligence	122.04 (13.42)	74.00 - 165.00	-0.46	1.17	0.88	33
Mindfulness (Describe)	26.12 (5.83)	9.00 - 14.00	-0.24	0.11	0.85 (range 0.84 - 0.86)	8

Note. SD = standard deviation,  $\alpha$  = Cronbach's alpha. Range of Cronbach's alpha for mindfulness is due to the multiple imputations for missing values.

Table 3. Intercorrelations of variables.

	1	2	3	4	5	6
1. Psychopathy	-	0.55***	0.27***	0.16*	-0.14	-0.02
2. Machiavellianism	0.55***	-	0.19***	0.18***	-0.15	-0.14*
3. Narcissism	0.27***	0.19***	-	-0.26***	0.43***	0.26***
4. Alexithymia	0.16**	0.18***	-0.26***	-	-0.48***	-0.73***
5. Emotional Intelligence	-0.14*	-0.15*	0.43***	-0.48***	-	0.41***
6. Mindfulness	-0.02	-0.14*	0.26***	-0.73***	0.41***	-

Note. \* $p < 0.05$ , \*\*  $p = 0.01$ ; \*\*\*  $p < 0.001$

Table 4. Regression model of psychopathy predicting mindfulness.

	B	SE B	$\beta$ (range)
<b>Step 1</b>			
Constant	38.72	3.62	
Psychopathy	1.11	0.47	0.10* (0.102 – 0.106)
Alexithymia	-0.39	0.03	-0.70** (-0.75 - -0.72)
Emotional Intelligence	0.04	0.02	0.09 (0.086 – 0.089)
<b>Step 2</b>			
Constant	38.78	3.62	
Psychopathy	1.13	0.48	0.10* (0.102 – 0.106)
Alexithymia	-0.39	0.03	-0.70** (-0.705 - -0.702)
Emotional Intelligence	0.04	0.02	0.09 (0.085 – 0.088)
Alexithymia Moderation	-0.02	0.05	-0.02 (-0.21 - -0.19)
Emotional Intelligence Moderation	-0.005	0.04	-0.01 (-0.007 – -0.006)

Note. \* $p < 0.05$ ; \*\* $p < 0.001$ .  $R^2_{adj} = 0.54$  for Step 1,  $\Delta R^2 = 0.00$  for Step 2 ( $p = 0.93$ ). Model:  $R^2 = 0.54$ ;  $R^2_{adj} = 0.53$ .  $\beta$  = mean  $\beta$ -weight across imputations, range of  $\beta$ -weights are across multiple imputations.

Table 5. Psychopathy model: correlations of predictors with mindfulness.

	Zero-order correlation	Partial correlation	Semipartial correlation
Psychopathy	-0.02	0.15	0.10
Alexithymia	-0.73*	-0.67	-0.61
Emotional Intelligence	0.41*	0.11	0.08
Alexithymia Moderation	0.01	-0.03	-0.02
Emotional Intelligence Moderation	0.04	-0.01	-0.01

Note. \* $p < 0.001$

Table 6. Regression model of Machiavellianism predicting mindfulness.

	B	SE B	$\beta$ (range)
<b>Step 1</b>			
Constant	41.13	3.71	
Machiavellianism	-0.03	0.41	-0.003 (-0.005 - -0.002)
Alexithymia	-0.38	0.03	-0.69* (-0.693 - -0.689)
Emotional Intelligence	0.03	0.02	0.08 (0.077 - 0.079)
<b>Step 2</b>			
Constant	41.19	3.72	
Machiavellianism	0.02	0.41	0.0025 (0.002 - 0.003)
Alexithymia	-0.38	-0.03	-0.69* (-0.693 - -0.689)
Emotional Intelligence	0.03	0.02	0.08 (0.074 - 0.077)
Alexithymia Moderation	-0.01	0.04	-0.02 (-0.017 - -0.016)
Emotional Intelligence Moderation	-0.03	0.03	-0.05 (-0.05 - -0.048)

Note. \* $p < 0.001$ .  $R^2_{adj} = 0.53$  for Step 1,  $\Delta R^2 = 0.02$  for Step 2 ( $p = 0.615$ ). Model:  $R^2 = 0.54$ ;  $R^2_{adj} = 0.53$ .  $\beta$  = mean  $\beta$ -weight across imputations, range of  $\beta$ -weights are across multiple imputations.

Table 7. Machiavellianism model: correlations of predictors with mindfulness.

	Zero-order correlation	Partial correlation	Semipartial correlation
Machiavellianism	-0.14*	0.004	0.002
Alexithymia	-0.73**	-0.66	-0.60
Emotional Intelligence	0.41**	0.097	0.07
Alexithymia Moderation	0.08	-0.02	-0.015
Emotional Intelligence Moderation	-0.07	-0.06	-0.04

Note. \* $p < 0.05$ ; \*\*  $p < 0.001$

Table 8. Regression model of narcissism predicting mindfulness.

	B	SE B	$\beta$ (range)
<b>Step 1</b>			
Constant	40.36	3.54	
Narcissism	0.68	0.50	0.07 (0.066 – 0.067)
Alexithymia	-0.38	0.03	-0.68* (-0.686 - -0.685)
Emotional Intelligence	0.02	0.02	0.05 (0.051 – 0.054)
<b>Step 2</b>			
Constant	41.06	3.66	
Narcissism	0.73	0.50	0.07 (0.066 – 0.072)
Alexithymia	-0.38	0.03	-0.691*
Emotional Intelligence	0.02	0.02	0.04 (0.040 – 0.043)
Alexithymia Moderation	-0.008	0.04	-0.01 (-0.01 - -0.008)
Emotional Intelligence Moderation	-0.03	0.03	-0.05 (-0.047 - -0.046)

Note. \* $p < 0.001$ .  $R^2_{adj} = 0.53$  for Step 1,  $\Delta R^2 = 0.002$  for Step 2 ( $p = 0.624$ ). Model:  $R^2 = 0.54$ ;  $R^2_{adj} = 0.53$ .  $\beta$  = mean  $\beta$ -weight across imputations, range of  $\beta$ -weights are across multiple imputations.

Table 9. Narcissism model: correlations of predictors with mindfulness.

	Zero-order correlation	Partial correlation	Semipartial correlation
Narcissism	0.26*	0.09	0.06
Alexithymia	-0.73*	-0.66	-0.59
Emotional Intelligence	0.41*	0.05	0.03
Alexithymia Moderation	0.08	-0.01	-0.008
Emotional Intelligence Moderation	-0.04	-0.06	-0.04

Note. \* $p < 0.001$

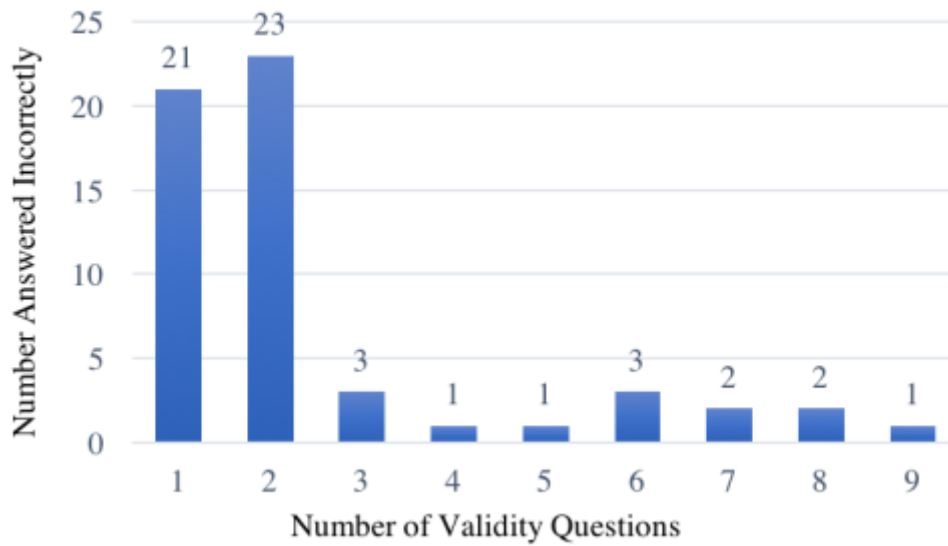


Figure 1. Number of validity questions answered incorrectly.

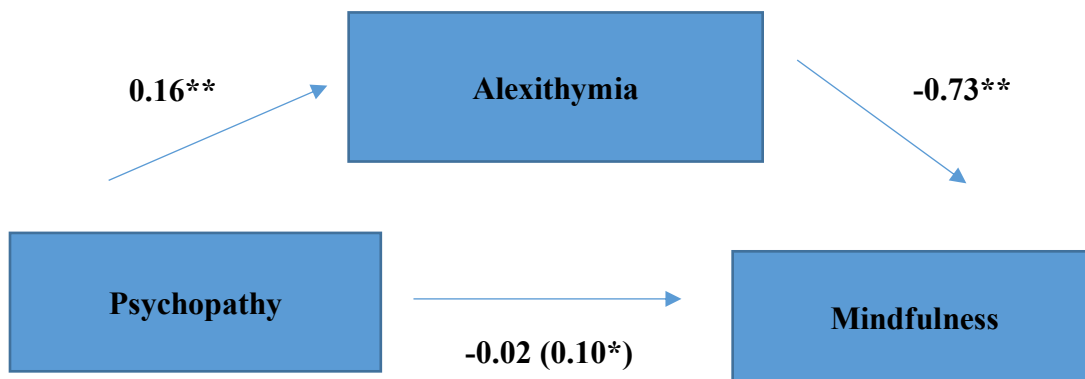


Figure 2. The mediation effect of alexithymia levels on the association between psychopathy levels and mindfulness levels from linear regression analyses. *Note.* \* $p < 0.05$ ; \*\* $p < 0.001$ . Values are standardized beta-coefficients. For the association between psychopathy and mindfulness, the value outside of parentheses is the beta-weight of the association between the two variables, and the value inside parentheses is the beta-weight once alexithymia is included in the model.



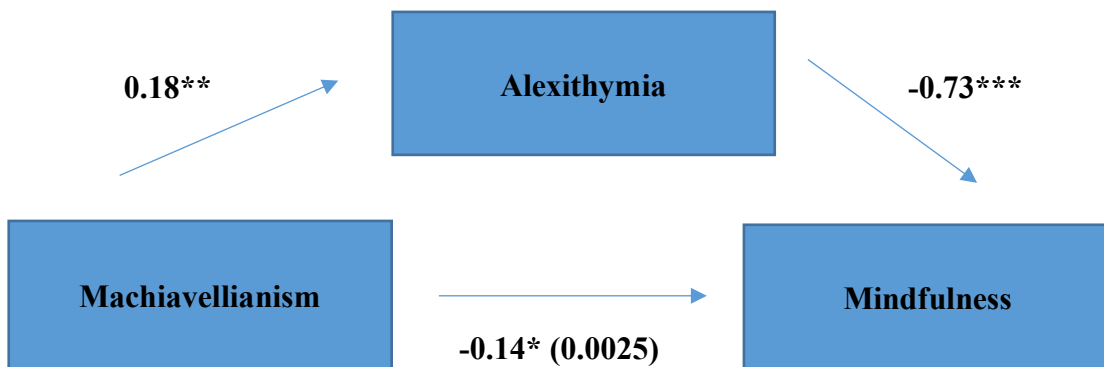


Figure 3. The mediation effect of alexithymia levels on the association between Machiavellianism levels and mindfulness levels from linear regression analyses. *Note.* \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . Values are standardized beta-coefficients. For the association between Machiavellianism and mindfulness, the value outside of parentheses is the beta-weight of the association between the two variables, and the value inside parentheses is the beta-weight once alexithymia is included in the model.

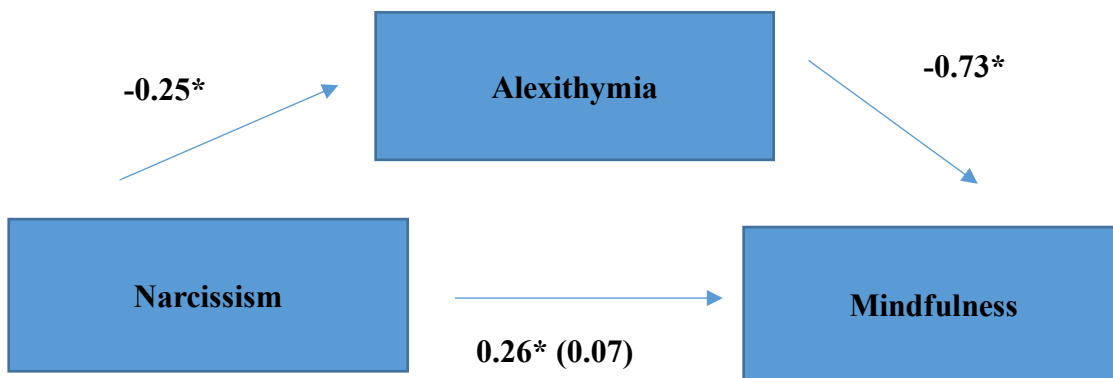


Figure 4. The mediation effect of alexithymia levels on the association between narcissism levels and mindfulness levels from linear regression analyses. *Note.* \* $p < 0.001$ . Values are standardized beta-coefficients. For the association between Machiavellianism and mindfulness, the value outside of parentheses is the beta-weight of the association between the two variables, and the value inside parentheses is the beta-weight once alexithymia is included in the model.

## APPENDIX A: MEASURES

### DEMOGRAPHIC INFORMATION

Date of Birth (MM/YY): \_\_\_/\_\_\_ Age (years): \_\_\_  
GENDER: [1] FEMALE [2] MALE [3] OTHER (specify): 4] PREFER  
NOT TO ANSWER

Race/ethnic background:

- [1] ABORIGINAL
- [2] ASIAN OR ASIAN DESCENT (NON-ARAB)
- [3] HISPANIC/LATINO
- [4] NON-HISPANIC BLACK OR AFRICAN DESCENT
- [5] NON-HISPANIC WHITE, CAUCASIAN, OR EUROPEAN DESCENT
- [6] ARAB OR MIDDLE-EASTERN DESCENT
- [7] OTHER/MIXED (please describe) \_\_\_\_\_
- [8] PREFER NOT TO ANSWER

Marital Status:

- [1] SINGLE
- [2] IN A ROMANTIC RELATIONSHIP (NON-COHABITING)
- [3] MARRIED/CIVIL UNION/COHABITING
- [4] DIVORCED/SEPARATED AND SINGLE
- [5] DIVORCED/SEPARATED AND IN A ROMANTIC RELATIONSHIP (NON-COHABITING)
- [6] WIDOWED

Please describe your current level of employment, outside of being a student:

- [1] Full-time (including volunteer work)
- [2] Part-time (including volunteer work)
- [3] Not currently employed or volunteering

### ACADEMIC HISTORY

Please indicate your year at UWindsor:

- [1] 1<sup>st</sup> year
- [2] 2<sup>nd</sup> year
- [3] 3<sup>rd</sup> year
- [4] 4<sup>th</sup> year
- [5] 5<sup>th</sup> year or beyond

To which academic faculty do you belong?

- [1] Faculty of Arts, Humanities and Social Sciences
- [2] Faculty of Science
- [3] Faculty of Business Administration
- [4] Faculty of Education
- [5] Faculty of Engineering

- [6] Faculty of Human Kinetics  
[7] Faculty of Nursing  
[8] Inter-Faculty Program, Please Specify:
- 

- Overall GPA: [1] below 60  
[2] 60-70  
[3] 70-80  
[4] 80 or above
- Major GPA: [1] below 60  
[2] 60-70  
[3] 70-80  
[4] 80 or above

Indicate your level of experience with mindfulness or other meditation practices, including yoga and other movement practices, other forms of meditation, devotional practice that is contemplative, and psychotherapy involving mindfulness:

- [1] No experience  
[2] Highly variable (e.g., some weeks you go to one 1 yoga class, some weeks you go to 8 yoga classes, sometimes you meditate at home)  
[3] 3 or fewer times per week every week for 6 months or less  
[4] Less than 6 months of experience (at least 4 times per week every week)  
[5] 3 or fewer times per week every week for more than 6 months  
[6] More than 6 months of experience (at least 4 times per week every week)

## Five-Facet Mindfulness Questionnaire

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
Never or Very Rarely True	Rarely True	Sometimes True	Often True	Very Often or Always True

- \_\_\_\_\_ 1. When I'm walking, I deliberately notice the sensations of my body moving.
- \_\_\_\_\_ 2. I'm good at finding words to describe my feelings.
- \_\_\_\_\_ 3. I criticize myself for having irrational or inappropriate emotions.
- \_\_\_\_\_ 4. I perceive my feelings and emotions without having to react to them.
- \_\_\_\_\_ 5. When I do things, my mind wanders off and I'm easily distracted.
- \_\_\_\_\_ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.
- \_\_\_\_\_ 7. I can easily put my beliefs, opinions, and expectations into words.
- \_\_\_\_\_ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
- \_\_\_\_\_ 9. I watch my feelings without getting lost in them.
- \_\_\_\_\_ 10. I tell myself I shouldn't be feeling the way I'm feeling.
- \_\_\_\_\_ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
- \_\_\_\_\_ 12. It's hard for me to find the words to describe what I'm thinking.
- \_\_\_\_\_ 13. I am easily distracted.
- \_\_\_\_\_ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
- \_\_\_\_\_ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.
- \_\_\_\_\_ 16. I have trouble thinking of the right words to express how I feel about things.
- \_\_\_\_\_ 17. I make judgments about whether my thoughts are good or bad.
- \_\_\_\_\_ 18. I find it difficult to stay focused on what's happening in the present.
- \_\_\_\_\_ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
- \_\_\_\_\_ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
- \_\_\_\_\_ 21. In difficult situations, I can pause without immediately reacting.
- \_\_\_\_\_ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
- \_\_\_\_\_ 23. It seems I am "running on automatic" without much awareness of what I'm doing.
- \_\_\_\_\_ 24. When I have distressing thoughts or images, I feel calm soon after.

- \_\_\_\_\_ 25. I tell myself that I shouldn't be thinking the way I'm thinking.
- \_\_\_\_\_ 26. I notice the smells and aromas of things.
- \_\_\_\_\_ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.
- \_\_\_\_\_ 28. I rush through activities without being really attentive to them.
- \_\_\_\_\_ 29. When I have distressing thoughts or images I am able just to notice them without reacting.
- \_\_\_\_\_ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
- \_\_\_\_\_ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
- \_\_\_\_\_ 32. My natural tendency is to put my experiences into words.
- \_\_\_\_\_ 33. When I have distressing thoughts or images, I just notice them and let them go.
- \_\_\_\_\_ 34. I do jobs or tasks automatically without being aware of what I'm doing.
- \_\_\_\_\_ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
- \_\_\_\_\_ 36. I pay attention to how my emotions affect my thoughts and behavior.
- \_\_\_\_\_ 37. I can usually describe how I feel at the moment in considerable detail.
- \_\_\_\_\_ 38. I find myself doing things without paying attention.
- \_\_\_\_\_ 39. I disapprove of myself when I have irrational ideas.

## TAS-20

Read the following statements and indicate your level of agreement with the statement.

The numbers vary with respect to agreement:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neither Agree nor Disagree
- 4 = Agree
- 5 = Strongly Agree

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	1	2	3	4	5
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. I am often confused about what emotion I am feeling.	1	2	3	4	5
2. It is difficult for me to find the right words for my feelings.	1	2	3	4	5
3. I have physical sensations that even doctors don't understand.	1	2	3	4	5
4. I am able to describe my feelings easily.	1	2	3	4	5
5. I prefer to analyze problems rather than just describe them.	1	2	3	4	5
6. When I am upset, I don't know if I am sad, frightened, or angry.	1	2	3	4	5
7. I am often puzzled by sensations in my body.	1	2	3	4	5
8. I prefer to just let things happen rather than to understand why they turned out that way.	1	2	3	4	5

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 9. I have feelings that I can't quite identify.   | 1 | 2 | 3 | 4 | 5 |
| 10. Being in touch with emotions is essential.  | 1 | 2 | 3 | 4 | 5 |
| 11. I find it hard to describe how I feel about people.                                 | 1 | 2 | 3 | 4 | 5 |
| 12. People tell me to describe my feelings more.  | 1 | 2 | 3 | 4 | 5 |
| 13. I don't know what's going on inside me.   | 1 | 2 | 3 | 4 | 5 |
| 14. I often don't know why I am angry.  | 1 | 2 | 3 | 4 | 5 |
| 15. I prefer talking to people about their daily activities rather than their feelings. | 1 | 2 | 3 | 4 | 5 |
| 16. I prefer to watch "light" entertainment shows rather than psychological dramas.     | 1 | 2 | 3 | 4 | 5 |

17. It is difficult for me to reveal my innermost feelings, even to close friends.	1	2	3	4	5
18. I can feel close to someone, even in moments of silence.	1	2	3	4	5
19. I find examination of my feelings useful in solving personal problems.	1	2	3	4	5
20. Looking for hidden meanings in movies or plays distracts from their enjoyment.	1	2	3	4	5

TAS-20 test items are under copyright by R. Michael Bagby, James D. A. Parker, and Graeme J. Taylor.



## Emotional Intelligence Scale

Instructions: Indicate the extent to which each item applies to you using the following scale:

- 1 = strongly disagree
- 2 = disagree
- 3 = neither disagree nor agree
- 4 = agree
- 5 = strongly agree

- \_\_\_\_\_ 1. I know when to speak about my personal problems to others.
- \_\_\_\_\_ 2. When I am faced with obstacles, I remember times I faced similar obstacles and overcame them.
- \_\_\_\_\_ 3. I expect that I will do well on most things I try.
- \_\_\_\_\_ 4. Other people find it easy to confide in me.
- \_\_\_\_\_ 5. I find it hard to understand the nonverbal messages of other people.
- \_\_\_\_\_ 6. Some of the major events of my life have led me to re-evaluate what is important and not important.
- \_\_\_\_\_ 7. When my mood changes, I see new possibilities.
- \_\_\_\_\_ 8. Emotions are some of the things that make my life worth living.
- \_\_\_\_\_ 9. I am aware of my emotions as I experience them.
- \_\_\_\_\_ 10. I expect good things to happen.
- \_\_\_\_\_ 11. I like to share my emotions with others.
- \_\_\_\_\_ 12. When I experience a positive emotion, I know how to make it last.
- \_\_\_\_\_ 13. I arrange events others enjoy.
- \_\_\_\_\_ 14. I seek out activities that make me happy.
- \_\_\_\_\_ 15. I am aware of the nonverbal messages I send to others.
- \_\_\_\_\_ 16. I present myself in a way that makes a good impression on others.
- \_\_\_\_\_ 17. When I am in a positive mood, solving problems is easy for me.
- \_\_\_\_\_ 18. By looking at their facial expressions, I recognize the emotions people are experiencing.
- \_\_\_\_\_ 19. I know why my emotions change.
- \_\_\_\_\_ 20. When I am in a positive mood, I am able to come up with new ideas.
- \_\_\_\_\_ 21. I have control over my emotions.
- \_\_\_\_\_ 22. I easily recognize my emotions as I experience them.
- \_\_\_\_\_ 23. I motivate myself by imagining a good outcome to tasks I take on.
- \_\_\_\_\_ 24. I compliment others when they have done something well.
- \_\_\_\_\_ 25. I am aware of the nonverbal messages other people send.
- \_\_\_\_\_ 26. When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself.
- \_\_\_\_\_ 27. When I feel a change in emotions, I tend to come up with new ideas.
- \_\_\_\_\_ 28. When I am faced with a challenge, I give up because I believe I will fail.
- \_\_\_\_\_ 29. I know what other people are feeling just by looking at them.
- \_\_\_\_\_ 30. I help other people feel better when they are down.
- \_\_\_\_\_ 31. I use good moods to help myself keep trying in the face of obstacles.
- \_\_\_\_\_ 32. I can tell how people are feeling by listening to the tone of their voice.
- \_\_\_\_\_ 33. It is difficult for me to understand why people feel the way they do.

### The Short Dark Triad (SD3)

Instructions: Please indicate how much you agree with each of the following statements

<i>Disagree Strongly</i>	<i>Disagree</i>	<i>Neither agree nor disagree</i>	<i>Agree</i>	<i>Agree strongly</i>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

- \_\_\_ 1. It's not wise to tell your secrets.
- \_\_\_ 2. I like to use clever manipulation to get my way.
- \_\_\_ 3. Whatever it takes, you must get the important people on your side.
- \_\_\_ 4. Avoid direct conflict with others because they may be useful in the future.
- \_\_\_ 5. It's wise to keep track of information that you can use against people later.
- \_\_\_ 6. You should wait for the right time to get back at people.
- \_\_\_ 7. There are things you should hide from other people to preserve your reputation.
- \_\_\_ 8. Make sure your plans benefit yourself, not others.
- \_\_\_ 9. Most people can be manipulated.
- \_\_\_ 10. People see me as a natural leader.
- \_\_\_ 11. I hate being the center of attention.
- \_\_\_ 12. Many group activities tend to be dull without me.
- \_\_\_ 13. I know that I am special because everyone keeps telling me so.
- \_\_\_ 14. I like to get acquainted with important people.
- \_\_\_ 15. I feel embarrassed if someone compliments me.
- \_\_\_ 16. I have been compared to famous people.
- \_\_\_ 17. I am an average person.
- \_\_\_ 18. I insist on getting the respect I deserve.
- \_\_\_ 19. I like to get revenge on authorities.
- \_\_\_ 20. I avoid dangerous situations.
- \_\_\_ 21. Payback needs to be quick and nasty.
- \_\_\_ 22. People often say I'm out of control.
- \_\_\_ 23. It's true that I can be mean to others.
- \_\_\_ 24. People who mess with me always regret it.
- \_\_\_ 25. I have never gotten into trouble with the law.
- \_\_\_ 26. I enjoy having sex with people I hardly know
- \_\_\_ 27. I'll say anything to get what I want.

### Validity Questions

1. If you are reading this, select “agree.”
2. If you are reading this, select “rarely true.”
3. The University of Windsor is in Ontario, select “strongly agree.”
4. There are 14 months in a year, select “strongly disagree.”
5. Oranges are orange in colour, select “strongly agree.”
6. If you are reading this, select “neither disagree nor agree.”

## VITA AUCTORIS

Antonette Scavone was born in 1990 in Toronto, Ontario. She graduated from Father Bressani Catholic High School in 2008. She then attended the University of Toronto Scarborough, from which she obtained an H.B.Sc. in Mental Health Studies in 2013. She is currently in the M.A. program in the Clinical Neuropsychology track at the University of Windsor.