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ROLE OF NEGATIVE PERSONALITY ON SLEEP QUALITY
AND EMOTION REGULATION

by

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Dedication

For my husband, for which I could not have found my own strength without.

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ABSTRACT

ROLE OF NEGATIVE EMOTIONS ON SLEEP QUALITY AND EMOTION REGULATION

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The relationship between sleep and emotion regulation has been well-established. Worsened sleep quality is associated with a diminished ability to regulate emotions. However, research has yet to examine potential mediators. This study aims to determine if the personality traits of the dark triad mediate this relationship. To test the hypothesis, an online survey was distributed to UHCL students and the general public. Participants answered questions regarding their sleep, ability to regulate emotions, personality, and demographics. Responses were analyzed using mediation analyses. The results showed that only psychopathy significantly mediated this relationship. Worsened sleep quality, mediated by higher ratings of psychopathy, results in a lessened ability to regulate emotions. These results allow for an improved ability to develop comprehensive treatments for poor sleep or emotion dysregulation.

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CHAPTER I:
INTRODUCTION

Personality Theory

There has long been debate about the operationalization of personality, and it has thus been difficult to conduct and reach consensual findings in personality research. Bergner (2020) addresses this lack of an operational definition to introduce a new definition of personality. Bergner suggests personality is “the enduring set of traits and styles that [an individual] exhibits, which characteristics represent dispositions (i.e., natural tendencies or personal inclinations) of this person, and ways in which this person differs from the ‘standard normal person’” (p. 4). Regarding this definition, Bergner describes traits as the tendency to engage in a specific behavior or experience an emotional state and defines styles as to how an individual produces their behaviors. While the appearance of this definition is new, it may yet provide an opportunity for personality theorists to begin to reach an agreement about the function and mechanisms of personality. However, due to the enduring lack of consensus of an operational definition, there are many theories of personality to examine.

The humanistic theory of personality focuses primarily on the changes that occur in an individual’s life and the effect those changes have on their personality (Osafo Hounkpatin et al., 2015). Specifically, the humanistic perspective of personality examines psychological growth and the achievement of needs as the basis of behavior. Theorists such as Abraham Maslow and Carl Rogers are founders of this theory, both proposing similar theories regarding self-actualization and the path towards it. Maslow (1943) suggested that motivation results from a hierarchy of needs. Those needs including physiological, safety-security, belongingness, esteem, and self-actualization needs. Rogers (1946) similarly hypothesized the tendency for self-actualizing is the driving

force behind behavior. The humanistic perspective of personality theory attributes personality to the growth and achievement of an individual's life potential.

Social cognitive theory similarly emphasizes the importance of situational influences, observational learning, and the cognitive processes that accompany them (Bandura, 1986). The social perspective began when Edwin Holt and Harold Brown (1931) theorized that all animals' behavior is produced to fulfill needs of feeling, emotion, and desire. In particular, the researchers proposed that a person cannot imitate until they have been imitated. Following, Albert Bandura (1977) conducted experiments that demonstrated the tendency for individuals to learn through observation and highlighted the role of our thoughts and beliefs as motivation for behavior. Bandura coined his perspective the social learning theory, a learning-focused view of the now broader social cognitive theory, which adds a consideration of cognitive processes.

The psychoanalytic theory alternatively concentrates on the experiences one has in development and considers the unconscious mind (Crocker & Baur, 2020). The psychoanalytic theory was originally proposed by Sigmund Freud and later supported by several Neo-Freudian theorists. Freud's theory established the unconscious id and conscious ego as the main components of personality and assumed sex was the primary motivator of behavior (Freud, 1923/1962). Most neo-Freudians and psychoanalytic perspectives, however, focused less on sex being the primary motivator. For example, Carl Jung similarly emphasized the importance of the unconscious but introduced the concept of the collective unconscious as being more critical to human behavior (Jung, 1912/1916). Alternatively, Alfred Adler focused less on the unconscious and instead on how interpersonal and social influences affect behavior (Adler et al., 1964). Erik Erikson also disagreed with Freud's concepts, claiming that personality was not determined in early childhood, but that it evolved as a child developed (Erikson, 1950).

The trait theory of personality was fathered by Gordon Allport, who based his theory on his discovery that a single English dictionary contained more than four thousand trait descriptive terms (Allport & Odbert, 1936). Following, Cattell and Mead (2008) identified sixteen total personality traits, and the commonly known Big Five personality traits (i.e., extraversion, neuroticism, openness to experiences, conscientiousness, and agreeableness) were deduced from that (McCrae & Costa, 1989). A major critic of Sigmund Freud's psychoanalytic theory and another advocate for the trait theory, Hans Eysenck, was also focused on the unique traits an individual can have and used them to examine the differences between individuals (Eysenck & Eysenck, 1985). Eysenck suggested that there were three distinct dimensions of personality: extraversion, neuroticism, and psychoticism.

The Dark Triad

Coined by Paulhus and Williams (2002), the dark triad of personality traits was developed to categorize three specific personality traits associated with norm-violating acts (Muris et al., 2017). The dark triad of personality traits includes Machiavellianism, narcissism, and psychopathy. Research in the dark triad has been steadily increasing since the beginning of the century, likely because the facets were found to correlate with each other. Despite their similarity, however, Paulhus and Williams (2002) did not find that the three constructs were equivalent in normative populations. The traits of the dark triad of personality are instead bridged by their norm-violating nature (Muris et al., 2017). While it is difficult to formulate an operational definition of the social norms that dictate normative influence and behavior, research demonstrates that behaviors congruent with society's set roles are favored over behaviors that are not (Kiesler, 1966; Shaffer, 1983). Ignoring the prescriptions or proscriptions set by social norms typically results in a bad

reputation. Thus, because the darkness is perceived as less benevolent than the light, the traits have been suitably labeled ‘dark’ (Adams & Osgood, 1973).

Machiavellianism, the manipulative trait, is exhibited when an individual behaves deceitfully and unemotionally (Paulhus & Williams, 2002). The trait was developed in Richard Christie’s assessment of Niccolò Machiavelli’s political philosophy, which teaches that scheming deceit is the means to worldly success (Christie & Geis, 1970). The personality trait’s key features include “a duplicitous interpersonal style, a cynical disregard for morality, and a focus on self-interest and personal gain” (Muris et al., 2017, p. 184). The Machiavellian trait is measured by the Mach-IV scale, a 20-item inventory that consists of 5-point Likert questions rating participant’s manipulative tactics, cynical view of human nature, and disregard for conventional morality. The Mach-IV scale is often regarded as the standard measure of Machiavellianism and was used for this study.

Subclinical narcissism, a form of narcissism that is not pathological, refers to the self-important trait. Subclinical narcissism is exhibited when an individual behaves selfishly, with an inflated sense of entitlement, and a lack of empathy for others (Set, 2020). This subclinical version of narcissism still features grandiosity, entitlement, dominance, and superiority, but on lesser scales (Paulhus & Williams, 2002). The term narcissism originates from the Grecian mythological tale of Narcissus, a beautiful man who became so consumed with his image that he wasted away looking at his reflection (Karakis, 2019). Subclinical narcissism can be measured by the Narcissistic Personality Inventory (NPI), a 40-item scale that considers the seven dimensions of narcissism: authority, self-sufficiency, superiority, exhibitionism, exploitativeness, vanity, and entitlement (Muris et al., 2017). The NPI is often considered as the standard measure of narcissism and was used for this study.

Subclinical psychopathy refers to the impulsive and anxious trait, in which individuals may thrill-seek and exhibit low empathy (Paulhus & Williams, 2002). The key features of subclinical psychopathy are lasting antisocial behavior, reduced empathy and remorse, and disinhibited or forward behavior (Muris et al., 2017). Psychopathy can be measured with the Psychopathy Checklist (PCL), which is most commonly used in forensic circumstances, the Psychopathic Personality Inventory (PPI), used in both clinical and non-clinical settings, and the Self-Report Psychopathy Scale (SRP-III), the measure used for this study. The SRP-III is a 64-item scale that considers interpersonal manipulation, callous affect, erratic lifestyle, and criminal tendencies.

Narcissism, Machiavellianism, and psychopathy have been suggested to be different measures of the same latent construct (Jonason & Webster, 2010). Together, the traits can be measured using the Short Dark Triad (SD3), which encourages researchers to study the personality traits in conjunction (Jones & Paulhus, 2014). The Dirty Dozen, an aptly named 12-item scale, is also used to measure all three constructs using the same response scale format (Jonason & Webster, 2010). For this study, we utilized both the Short Dark Triad (SD3) and the Dirty Dozen for measuring Machiavellianism, narcissism, and psychopathy in individuals (Jones & Paulhus, 2014).

Emotion Theory

Researchers have proposed anywhere from six to twenty-something basic emotions, ranging from happiness and anger to relief and awe (Cowen & Keltner, 2017; Ekman, 1970). Early in emotion theory research, Ekman (1970) suggested there were only six basic emotions: happiness, sadness, anger, fear, surprise, disgust, and interest. Alternatively, and more recently, Cowen and Keltner (2017) introduced over twenty more emotions, including disgust, surprise, and admiration. Emotions can even be universal, as research has shown achievement to be demonstrated similarly in multiple

countries and cultures (Loderer et al., 2020). Moreover, similarities in emotion expression have been demonstrated in individuals born blind, showing the spontaneous production of similar expressions to those who are not blind (Valente et al., 2018).

Basic emotion theory (BET) offers a broad definition of emotion: “emotion is a brief state that arises following appraisals of interpersonal or intrapersonal events, and involves distinct antecedents, signaling, physiology, and action and appraisal tendencies that demonstrate some coherence and are observed in related form in our primate relatives” (Keltner et al., 2019, p. 196). This theory suggests that there are a limited number of basic emotions and provides a general description of how emotions are produced. There are, however, various other theories of emotion that also attempt to discern the critical function and origins of emotion.

Research in emotion theory began with Darwin (1872), who proposed an evolutionary theory of emotions. Darwin (1872) assumed emotions were adaptive; that they evolved for survival and reproduction. With the ability to perceive and experience emotion, humans and animals would be able to quickly respond to their environment, possibly prolonging their lives. This ability would also have allowed early humans to communicate before a verbal language had been conceived. Similarly, by experiencing love or affection, Darwin (1872) proposed we might be more likely to seek a mate and reproduce. The evolutionary theory of emotion takes a unique stance on an intricate process, but it may provide a basis for the most rudimentary functions of emotion. Following Darwin’s work, researchers began to further study the bases of human emotion to examine its deeper processes and mechanisms.

The combined works of James (1884) and Lange (1887), coined the James-Lange theory of emotion, takes a physiological standpoint in its effort to explain emotion. This theory suggests that an external stimulus first produces a physiological reaction, then

your emotions are simply interpretations of that reaction. To clarify, a dangerous situation might cause a body to physically shake, and, thus, you would become afraid. Being afraid does not precede the shaking. The James-Lange theory of emotion predominated until Cannon and his graduate student, Bard, introduced a competing theory, aptly titled the Cannon-Bard theory (Cannon, 1927). Similar to the James-Lange theory, the facial feedback theory of emotion proposes that emotions are often consequences of perceiving facial expressions, meaning another's expression might invoke an emotional response (Coles et al., 2019). Instead of facial expressions simply being the result of experiencing emotions, this theory postulates that another's physiological expression can be the external stimuli that produce an emotional response.

The Cannon-Bard theory introduced the argument that emotions do not originate from any physiological reaction to external stimuli but, more specifically, a physiological reaction in the brain (Cannon, 1927). Cannon (1927) suggested that emotions occur too quickly to be products of a physiological response and instead proposed that the physiological and psychological experience of emotion must occur simultaneously. Through experimentation, Cannon discovered that, without signals from the body, the brain could still experience emotion, discrediting the James-Lange theory of emotion (Cannon, 1927; James, 1884; Lange, 1887). This theory provides an example of a neurological theory of emotions. It hypothesizes that emotions originate from the brain.

Cognitive theories of emotion alternatively consider thoughts to be the origin of emotion. The Schachter-Singer theory suggests that when a physiological response to an external stimulus occurs, the mind must interpret and then label the resulting emotion (Schachter & Singer, 1962). This theory draws on both the above-mentioned theories, combining the physiological and psychological aspects, then introducing cognition. Similar to the Schachter-Singer theory, the cognitive appraisal theory of emotion

proposes that thinking occurs before physiological responses and emotions, but the process may be nearly simultaneous (Folkman & Lazarus, 1988; Lazarus & Folkman, 1987). An example of this process would involve a dangerous situation that is immediately perceived as dangerous, leading to the emotion of fear and anxiety.

Emotion Regulation

Emotion regulation is the practice of managing the onset, intensity, and duration of an individual's emotions, which may occur at any time of the emotional experience (Gross, 1998). Gross (1998) describes five aspects of his definition of emotion regulation. First, individuals will increase, decrease, or maintain positive and negative emotions. Second, emotion circuits in the brain do not appear to overlap completely. Third, emotion regulation regards an individual's self, not others. Fourth, emotion regulation may be conscious or unconscious, as well as automatic or controlled. Lastly, Gross (1998) states emotion regulation in this definition is neither negative nor positive.

Gross (1998) explains that emotion regulation, whether intentional or not, is not always appropriately managed. Responses that would have been appropriate for one situation or time may not be appropriate for another. The Gross (1998) model for emotion regulation involves a process-oriented approach that begins with an internal evaluation of emotional cues, is followed by a behavioral, experiential, or physiological emotional response, and is lastly modulated for the resulting emotional output. The model also provides five types of emotion regulation processes: "situation selection, situation modification, attention deployment, cognitive change, and response modulation" (p. 281).

Aldao et al. (2010) alternatively list the emotion regulation strategies as "acceptance, avoidance, problem solving, reappraisal, rumination, and suppression" (p. 217). The two strategies assumed to be the most adaptive are reappraisal and problem-solving. Reappraisal refers to the implementation of a positive or benign outlook

regarding a situation, and problem-solving refers to an attempt to change or avoid the consequences of a situation. The Generalized Expectancy for Negative Mood Regulation Scale (NMR) is a 30-item self-report questionnaire that is used to measure emotion regulation. The Difficulties in Emotion Regulation Scale (DERS) is a 36-item self-report scale that is also often used to measure emotion dysregulation (Gratz & Roemer, 2004). The DERS scale was used for this study.

Sleep Theory

Carskadon and Dement (2011) define sleep as a “reversible behavioral state of perceptual disengagement from and unresponsiveness to the environment” (p. 16). Alongside the behavioral definition, sleep also involves various physiological processes. Typically, when an individual falls asleep, they may lie down, close their eyes, and become generally inactive. However, these characteristics all have exceptions, as many have fallen asleep while sitting, slept with their eyes open, or begun sleep talking. Sleep is a necessary process for survival, yet the purpose is still largely unknown. Research has produced many theories for the principal function of sleep, including physical restoration, neurocognition, and adaptive immobility (Assefa et al., 2015).

Theories for the restorative function of sleep posit that sleep is necessary because of the beneficial physiological changes that occur when asleep (Assefa et al., 2015). Dissimilar to catabolic hormones, such as cortisol, which is associated with being awake, anabolic hormones, such as the growth hormone, are released when asleep (Weitzman et al., 1974). Similarly, because sleep is associated with reduced levels of energy consumption, it is hypothesized that sleep is necessary for the conservation of energy (Jung et al., 2011). Sleep can even improve the early stages of an immune response (Lange et al., 2011). However, despite these favorable functions, protein synthesis is greater when awake and energy consumption increases in the REM stage of sleep,

proving these theories inadequate (Assefa et al., 2015). While the restorative function of sleep has yet to be established as the main function of sleep, these functions have, at the very least, demonstrated their physiological importance.

Alternatively, theories that hypothesize sleep is essential for optimal neurocognition are based on the assumption that sleep is necessary for the development of motor skills, memory formation, and higher-level cognition (Assefa et al., 2015). Walker et al. (2002) demonstrated that sleep enhances motor learning, specifically in late-stage N2 sleep. Similarly, it has been discovered that, not only is sleep beneficial in learning efficiency, but also the retention of learning (De Koninck et al., 1989; Marshall et al., 2006). Research in both fields has found evidence that slow-wave sleep (SWS) and rapid eye movement (REM) sleep are critical for higher-level cognitive functioning (Assefa et al., 2015). It has even been suggested that sleep removes the emotionality of memories, aiding in the potential forgetting of negative events experienced in the past (Goldstein & Walker, 2014). Lim and Dinges (2010) postulate that sleep affects overall mental performance. Yet, despite the established function of improved cognition, neurocognitive theories do not address sleep's physiological purposes and consequences.

Similarly, adaptive immobility theories posit that sleep is required solely to protect an animal from the ongoing risk of predation and that it has no other physiological benefits (Assefa et al., 2015). These theories assume that sleep is necessary only to take up time. Undoubtedly, this theory is inadequate given the numerous above-mentioned functions of sleep, though it may have once held a significant function in our ancestors. Without sleep, a wide variety of neurobehavioral, endocrine, metabolic, and inflammatory problems can occur. Regardless, the theories which attempt to explain the critical function of sleep have yet to provide a comprehensive explanation.

Sleep itself is a highly subjective experience that is also difficult to operationalize. The various functions of sleep onset may vary for any individual at any given time. Sleep onset is generally associated with changes in electroencephalogram (EEG) patterns, electromyogram (EMG) patterns, and electrooculogram (EOG) patterns. These changes are typically identified within several seconds of the transition (Carskadon & Dement, 2011). Behaviorally, sleep onset is commonly associated with diminished sensory responses to visual, auditory, and olfactory stimuli. Sleep consists of two discernable states: rapid eye movement (REM) and non-rapid eye movement (NREM). Carskadon and Dement (2011) describe REM as an active brain in an immobile body, while NREM is an otherwise inactive brain in a mobile body.

NREM is characterized by fragmented or minimal mental activity, with an EEG pattern of slow synchronous waves (Carskadon & Dement, 2011). NREM is divided into three numbered stages that coincide with the arousal threshold, stage N1 being the lowest, followed by stage N2, and stage N3, the highest threshold (Silber et al., 2007). Normal adult humans with a conventional sleep-wake schedule will begin in stage N1 when they fall asleep and typically stay in this stage for only a few minutes (Carskadon & Dement, 2011). Following, stage N2 is entered and accounts for approximately one-half of total sleep. This stage is interrupted by stage N3, sometimes referred to as slow-wave sleep (SWS), which predominates in the first third of sleep. These stages of NREM sleep alternate with REM sleep cyclically throughout the night.

REM, or stage R sleep, gets its nomenclature from the bursts of rapid eye movement that are the most common marker used to distinguish this type of sleep (Carskadon & Dement, 2011). Stage R sleep is characterized by mental activation, muscle activation, and rapid eye movements. In a normal human adult with a conventional sleep-wake schedule, Stage R sleep typically occurs in several distinct

episodes, accounting for almost a third of sleep. Additionally, the mental activity demonstrated in R sleep is associated with dreaming. The ideal distribution of R stage episodes is linked to a circadian oscillator that is determined by the oscillation of internal body temperature and synced with solar time. Stage R sleep usually predominates the last third of sleep.

Sleep Quality

Sleep quality is a clinical construct used to represent the complex phenomenon of sleep (Buysse et al., 1989). The construct involves the quantitative qualities of sleep, such as duration, latency, number of times woken, and depth of restfulness. Some of these qualities are measured objectively, such as duration and number of times woken, but qualities like depth and restfulness can be difficult to operationalize because they are subjective. Research in sleep quality is important because sleep quality complaints are common in the general population. Moreover, poor sleep quality can be a symptom of various sleep disorders and medical issues, including psychiatric disorders. Specifically, sleep quality complaints are highly related to anxiety and stress and the symptoms commonly occur together.

The Pittsburgh Sleep Quality Index (PSQI) was developed to provide a standardized measure of sleep quality, to discriminate between good and bad sleep types, and to provide an interpretable index for researchers (Buysse et al., 1989). The index includes 19 self-rated questions used to generate seven scores regarding “subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction” (Buysse et al., 1989, p. 195). For this study, we will use the Pittsburgh Sleep Quality Index (PSQI) to measure sleep quality (Buysse et al., 1989).

Personality & Sleep

Research on the relationship between personality and sleep commenced within the past decade when Sabouri et al. (2016) supported the hypothesis that unfavorable traits were associated with poor sleep habits. Sabouri et al. (2016) hypothesized that the dark triad of personality traits would be associated with higher sleep disturbances due to the traits' association with emotion dysregulation. Over three hundred adult participants completed an online survey including the Mach-IV Machiavellianism test, the Narcissistic Personality Inventory (NPI), the Self-Report Psychopathy Scale-III (SRP-III), the Insomnia Severity Index (ISI), the Anxiety Sensitivity Index-3 (ASI), and the Intolerance of Uncertainty Scale. Sabouri et al. (2016) found that the dark triad's traits were associated with more frequent sleep disturbances, anxiety, and intolerance of uncertainty. Specifically, the Machiavellianism trait and psychopathy trait both showed a significant positive association with increased sleep disturbances. The narcissism trait was not significantly associated with sleep disturbances. These findings supported the assumption that unfavorable traits and poor sleep are associated.

Akram et al. (2018) similarly investigated the relationship between the dark triad personality traits and insomnia. Akram et al. (2018) analyzed 475 participants with an online survey that included the 27-item Short Dark Triad questionnaire (SD3), the Insomnia Severity Index (ISI), and subscales of the SLEEP-50 questionnaire. Akram et al. (2018) found that psychopathy was significantly related to insomnia symptoms, Machiavellianism neared significance, and narcissism was not associated with insomnia symptoms, further establishing that the unfavorable personality traits of the dark triad were associated with sleep disturbances.

Following the initial demonstration of a significant association between personality and sleep, researchers began to examine possible mediators. Grove et al.

(2017) examine the mediating role of emotion regulation on the association between personality and sleep quality in adolescents. Grove et al. (2017) asked participants to self-report on the Borderline Symptom List (BPD), Pittsburgh Sleep Quality Index (PSQI), and Difficulties in Emotion Regulation Scale (DERS). The results revealed that the borderline personality characteristics which corresponded the most with emotion dysregulation demonstrated the strongest correlations with poor sleep quality. These findings provided preliminary evidence that emotion dysregulation affects the association between borderline personality disorder and poor sleep quality.

Similarly, Wall et al. (2020) further examined the association between sleep disturbances and borderline personality disorder in adolescent inpatients and hypothesized emotion regulation to be a key mediator. Wall et al. (2020) privately administered the Borderline Personality Features Scale for Children (BPFSC), the Difficulties in Emotion Regulation Scale (DERS), the School Sleep Habits Survey (SSHS), and the Beck Depression Inventory (BDI) to 217 adolescents recruited from an inpatient psychiatric unit. The study reinforced the significant correlation between borderline personality symptoms and sleep disturbance, demonstrated emotion dysregulation and borderline personality symptoms were significantly correlated with indices of sleep disturbance, but it was not able to provide empirical support that emotion dysregulation mediated this relation. Wall et al. (2020) attributed the lack of significance to problems regarding sleep hygiene in existing interventions for borderline personality disorder and suggested further research is necessary.

Emotion Regulation & Sleep

The association between emotion regulation and sleep has been similarly established by Baum et al. (2014), which examined how restricting sleep affected mood regulation in adolescents. Baum et al. (2014) observed the mood and mood regulation of

50 adolescents after manipulating the amount of time spent in bed for three weeks. First, a baseline week of sleep was recorded, restricted to 6.5 hours for the next week, and increased to 10 hours for the last week. The results demonstrated that, after a few days of reduced sleep time, the adolescents experienced a lower mood and a worsened ability to regulate their negative emotions.

Alternatively, Akram et al. (2019) investigated the relationship between the Big Five personality traits and insomnia, as well as the effect emotion regulation had on sleep quality. Akram et al. (2019) analyzed 557 participants with an online survey that included the Ten Item Personality Inventory (TIPI), the Insomnia Severity Index (ISI), the Hospital Anxiety and Depression Scale (HADS), and subscales of the SLEEP-50 questionnaire. The study found that extroversion, agreeableness, conscientiousness, and emotional stability were related to symptoms of insomnia, and diminished conscientiousness and emotional stability were significantly predictive of insomnia.

However, despite the bidirectional association between emotion regulation and sleep, research has yet to seek potential mediators. The present study sought to better understand how personality is associated with our ability to regulate emotions and sleep well by examining the mediating effects of the dark triad of personality traits in the association between emotion regulation and sleep quality.

CHAPTER II: METHODOLOGY

Participants

Participants were recruited through the UHCL participant pool (SONA). A sample of 210 participants was recruited, but 24 did not complete the survey and were excluded from the study (N = 186). Participants in the the sample predominantly identified as female (78.5%), with 19.9% identifying as male and 1.6% identifying as non-binary. Participant demographics demonstrated that 41.9% of our sample was White/Non-Hispanic, 29% Hispanic/Latinx, 11.3% Black/African American, and 7.5% Asian/Pacific Islander. The remaining participants reported being Multi-Racial (9.1%) or Other (1.1%). The only exclusion criterion was that participants be at least 18 years old. For participants recruited online, the only restriction was that they could read English. Participants who could not provide informed consent were not utilized in this study.

Measures

This study utilized self-report measures, including a demographic survey and several validated measures. The demographic survey included questions regarding age, gender, race/ethnicity, and the highest level of education.

Short Dark Triad

The Short Dark Triad (SD3) (Jones & Paulhus, 2014) is a 27-item self-report measure that employs a 5-point Likert scale and was utilized to measure the dark triad. It contains three subscales that measure the constructs of Machiavellianism, psychopathy, and narcissism. Higher scores are associated with greater demonstration of these traits.

Dirty Dozen

The Dirty Dozen (DD) (Jonason & Webster, 2010) measure includes twelve 7-point Likert scale self-report questions and was utilized to measure the dark triad. It

contains three subscales that measure the constructs of Machiavellianism, psychopathy, and narcissism. Higher scores are associated with greater demonstration of these traits.

Difficulties in Emotion Regulation Scale

The Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004) was used to measure emotion regulation. The DERS measure is a 36-item self-report scale which utilizes a 5-point Likert scale. Higher scores on this scale indicate greater problems with emotion regulation.

Pittsburgh Sleep Quality Index

The Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1989) was utilized to measure sleep quality. The PSQI is a 19-item self-report measure regarding the previous month's sleep habits. Higher scores on this index indicate more problems with sleep and, therefore, lower sleep quality.

Procedure

Upon navigating to the study website, participants were presented with the informed consent form. The informed consent form was read by participants, who then indicated that they agreed to participate in the study. Participants who did not agree to the informed consent form were not able to proceed with the study.

UHCL students were recruited through the SONA participant pool system. The participants were asked to read and agree to an informed consent form before they could proceed. The consent form included information about the participants' rights and the responsibilities as a potential participant, and researcher contact information was provided so that participants could ask questions about these rights or the purpose of the study. Participants who completed the informed consent form were then asked to complete an online self-report survey that asked demographic questions and included questionnaires about sleep quality, emotion regulation, and personality traits. However,

due to an error in the online survey, bedtime was not properly coded. Therefore, habitual sleep efficiency was coded by taking the total amount of sleep reported and dividing it by the sum of the total amount of sleep and time it took to fall asleep. The survey took approximately 2 – 10 minutes to complete through the UHCL Qualtrics system.

An additional group of participants from the general population was recruited through the website Reddit. These participants were then redirected to the UHCL Qualtrics system and asked to read and agree to an informed consent form before they could proceed with the online survey. The consent form included information about the participants' rights and the responsibilities as a potential participant, and researcher contact information was provided so that participants could ask questions about these rights or the purpose of the study. Participants who completed the informed consent form were then asked to complete the survey.

Statistical Analysis

Descriptive statistics were computed for demographic characteristics of the participants and each of the measures completed. Means and standard deviations or percentages were computed for continuous variables, and percentages were computed for categorical variables. Pearson's r was computed to determine the relationship between each of the measures. Single mediation analysis was performed to examine if constructs within the dark triad mediated the relationship between sleep quality (PSQI) and emotional regulation (DERS). A separate analysis was performed for each of the three constructs: Machiavellianism, psychopathy, and narcissism. These analyses were repeated for both the DD and SD3 scales. All statistical analyses were performed using Jamovi (version 1.6.15) utilizing an alpha-level of .05. Mediation analysis was performed utilizing the 'medmod' package in jamovi (Selker, 2017), which is a part of the 'lavaan' package for R (Rosseel, 2012).

CHAPTER III:

RESULTS

Demographic data regarding gender identity, race/ethnicity, and education attainment are displayed in Table 1. The sample predominantly identified as female (78.5%), and nearly half of the participants were White/Non-Hispanic (41.9%). Participants ranged from 18 to 54 years old, and the average age was 25.2 ($SD = 5.97$). Descriptive statistics for each of the validated measures are provided in Table 2.

Table 3 displays a correlation matrix depicting the correlation coefficients between the different measures. PSQI was significantly associated with psychopathy scores for both the DD, $r = .20, p = .006$, and SD3, $r = 0.21, p = .004$. DERS was significantly correlated with every subscale within DD and SD3, as well as the PSQI, $r = .382, p < .001$. All subscales were significantly associated with each other.

Mediation analyses displayed in Table 4 – 6 were used to test if the subscales of DD mediated the relationship between PSQI and DERS. The mediation analysis did not indicate a significant indirect mediation with the DD subscales of Machiavellianism (Indirect Effect = .22, $p = .105$) or narcissism (Indirect Effect = .02, $p = .851$). However, it was significantly mediated by psychopathy (Indirect Effect = .44, $p = .014$).

To provide additional validation, mediation analyses were used to test the subscales of SD3, displayed in Table 7 – 9. The mediation analysis of the relationship between PSQI and DERS did not indicate a significant indirect mediation with the SD3 subscales of Machiavellianism (Indirect Effect = .20, $p = .167$) or narcissism (Indirect Effect = .12, $p = .182$). However, this relationship was significantly mediated by psychopathy (Indirect Effect = .34, $p = .022$). Overall, for both the DD and SD3 measures of psychopathy, higher scores on the PSQI are mediated by higher scores of psychopathy, both contributing to higher scores of DERS.

Table 1 Participant Demographics

	N	%
Gender		
Female	146	78.5
Male	37	19.9
Non-Binary	3	1.6
Race/Ethnicity		
Black/African American	21	11.3
Asian/Pacific Islander	14	7.5
Hispanic/Latinx	54	29.0
White/Non-Hispanic	78	41.9
Multi-Racial	17	9.1
Other	2	1.1
Education Attainment		
Did not complete HS	1	0.5
High School/GED	20	10.8
Some College	103	55.4
Undergraduate Degree	55	29.6
Graduate Degree	7	3.8

Note: n = 186

Table 2 Measures

	Mean	SD
Difficulties in Emotional Regulation Scale (DERS)	92.6	26.2
Pittsburgh Sleep Quality Index (PSQI)	8.46	3.99
Dirty Dozen (DD)		
Machiavellianism	2.77	1.39
Psychopathy	2.18	1.23
Narcissism	3.24	1.43
Short Dark Triad (SD3)		
Machiavellianism	2.71	0.77
Psychopathy	1.97	0.59
Narcissism	2.64	0.60

Note: $n = 186$

Table 3 Correlation Matrix

	DERS	PSQI	DD Mach	DD Psyc	DD Narc	SD3 Mach	SD3 Psyc	SD3 Narc
DERS	1.0							
PSQI	.382*	1.0						
DD Mach	.291*	.130	1.0					
DD Psyc	.387*	.202*	.551*	1.0				
DD Narc	.258*	.014	.519*	.370*	1.0			
SD3 Mach	.344*	.105	.616*	.565*	.561*	1.0		
SD3 Psyc	.312*	.211*	.487*	.616*	.435*	.599*	1.0	
SD3 Narc	.202*	.117	.206*	.146*	.370*	.311*	.359*	1.0

Note: $n = 186$; DERS - Difficulties in Emotional Regulation Scale; PSQI - Pittsburgh Sleep Quality Index; DD Mach - Dirty Dozen Machiavellianism; DD Psych - Dirty Dozen Psychopathy; DD Narc - Dirty Dozen Narcissism; SD3 Mach - Short Dark Triad Machiavellianism; SD3 Psych - Short Dark Triad Psychopathy; SD3 Narc - Short Dark Triad Narcissism. * $p < .05$

Table 4 Mediation Analysis: DD Machiavellianism

Mediation Estimates

Effect	Estimate	SE	Z	p
Indirect	0.218	0.134	1.62	0.105
Direct	2.295	0.432	5.31	< .001
Total	2.513	0.445	5.64	< .001

Path Estimates

			Estimate	SE	Z	p
PSQI Total	→	DD Machiavellianism	0.0451	0.0253	1.79	0.074
DD Machiavellianism	→	DERS Total	4.8320	1.2439	3.88	< .001
PSQI Total	→	DERS Total	2.2954	0.4321	5.31	< .001

Table 5 Mediation Analysis: DD Psychopathy

Mediation Estimates

Effect	Estimate	SE	Z	p
Indirect	0.444	0.180	2.47	0.014
Direct	2.070	0.425	4.87	< .001
Total	2.513	0.445	5.64	< .001

Path Estimates

			Estimate	SE	Z	p
PSQI Total	→	DD Psychopathy	0.0626	0.0223	2.81	0.005
DD Psychopathy	→	DERS Total	7.0853	1.3714	5.17	< .001
PSQI Total	→	DERS Total	2.0698	0.4253	4.87	< .001

Table 6 Mediation Analysis: DD Narcissism

Mediation Estimates

Effect	Estimate	SE	Z	p
Indirect	0.0231	0.123	0.188	0.851
Direct	2.4903	0.428	5.816	< .001
Total	2.5134	0.445	5.642	< .001

Path Estimates

			Estimate	SE	Z	p
PSQI Total	→	DD Narcissism	0.00499	0.0265	0.188	0.851
DD Narcissism	→	DERS Total	4.63711	1.1845	3.915	< .001
PSQI Total	→	DERS Total	2.49027	0.4282	5.816	< .001

Table 7 Mediation Analysis: SD3 Machiavellianism

Mediation Estimates

Effect	Estimate	SE	Z	p
Indirect	0.214	0.155	1.38	0.167
Direct	2.263	0.424	5.34	< .001
Total	2.477	0.447	5.54	< .001

Path Estimates

			Estimate	SE	Z	p
PSQI Total	→	SD3 Machiavellianism	0.0205	0.0142	1.44	0.149
SD3 Machiavellianism	→	DERS Total	10.4579	2.1857	4.78	< .001
PSQI Total	→	DERS Total	2.2626	0.4241	5.34	< .001

Table 8 Mediation Analysis: SD3 Psychopathy

Mediation Estimates

Effect	Estimate	SE	Z	p
Indirect	0.337	0.148	2.29	0.022
Direct	2.176	0.440	4.94	< .001
Total	2.513	0.445	5.64	< .001

Path Estimates

			Estimate	SE	Z	p
PSQI Total	→	SD3 Psychopathy	0.0314	0.0107	2.94	0.003
SD3 Psychopathy	→	DERS Total	10.7493	2.9579	3.63	< .001
PSQI Total	→	DERS Total	2.1760	0.4403	4.94	< .001

Table 9 Mediation Analysis: SD3 Narcissism

Mediation Estimates

Effect	Estimate	SE	Z	p
Indirect	0.124	0.0925	1.34	0.182
Direct	2.390	0.4419	5.41	< .001
Total	2.513	0.4454	5.64	< .001

Path Estimates

			Estimate	SE	Z	p
PSQI Total	→	SD3 Narcissism	-0.0178	0.0110	-1.61	0.107
SD3 Narcissism	→	DERS Total	-6.9553	2.9212	-2.38	0.017
PSQI Total	→	DERS Total	2.3899	0.4419	5.41	< .001

CHAPTER IV: DISCUSSION

The relationship between sleep and emotion regulation is clearly established by previous research (Akram et al., 2019; Baum et al., 2014). The relationship between personality and sleep has also been examined (Akram et al., 2018; Sabouri et al., 2016). However, despite the bidirectional association demonstrated between emotion regulation and sleep, research has yet to focus on potential mediators. The present study attempted to investigate the mediating roles of the dark triad personality traits in this relationship.

Consistent with the hypothesis, worsened sleep quality significantly predicted a decreased ability to regulate emotions. Additionally, sleep quality was demonstrated to be mediated by psychopathy for both measures of the dark triad. Thus, worsened sleep quality is shown to be associated with higher ratings of psychopathy, which is subsequently associated with decreased ability to regulate emotions. These findings relate to Wall et al. (2020), which demonstrates emotion dysregulation and borderline personality symptoms are significantly correlated with indices of sleep disturbance, and Grove et al. (2017), which provided preliminary evidence that emotion dysregulation affects the association between borderline personality disorder and poor sleep quality. This relationship, however, does not seem to hold true for Machiavellianism and narcissism on either measure of the dark triad.

All three traits of the dark triad were highly, and significantly, correlated with DERS except SD3 narcissism, which demonstrated a weaker association. This was true for both the Dirty Dozen and Short Dark Triad. Additionally, all three traits of the dark triad significantly correlated with their corresponding trait on both measures.

A limitation of this study is the self-report nature of its measures. Measures like these allow for various biases, like social desirability bias and self-report bias to occur.

Social desirability bias occurs when a participant reports untruthfully to present themselves in a more likable or impressive manner. The participant's actual introspective ability can also be an issue. Self-report bias allows for a participant to respond inconsistently or incorrectly simply because they are permitted to produce an answer. Additionally, a memory bias might prevent a participant from reporting correctly to questions because they may have forgotten the answer. A replication of this study with more observational measures might prevent these biases from occurring.

Another limitation of this study is that data collection occurred during the novel coronavirus disease 2019 (COVID-19) pandemic. Gupta et al. (2020) has demonstrated that sleep patterns were affected by the COVID-19 lockdown. Nearly 38% of the participants had clinical insomnia following the outbreak. Thus, because the present pandemic was associated with worsened sleep quality and the potential for emotion dysregulation, the present study's results were likely skewed. An exploration of additional covariates could also reveal other potential variables. A replication of this study following the COVID-19 pandemic could provide more accurate results and a unique opportunity to compare data from during the pandemic and after.

The present study demonstrated the unique relationship between sleep, personality, and emotion regulation. Results revealed that psychopathy significantly mediated the relationship between how well we sleep and our ability to regulate emotions. Further research should expand on the reasons the other traits of the dark triad did not significantly mediate this relationship. This study reveals that when sleep problems are increased, we can expect to see increased emotion dysregulation. Identifying and understanding the mediators of the relationship between sleep and emotion regulation would allow for an improved ability to create comprehensive treatments for poor sleep or emotion dysregulation.

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