The Dark Tetrad, Perceived Stress, Coping, and Depression

By

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ABSTRACT

Occupational stress has a significant negative influence on the physical health, psychological wellbeing, and performance of employees. The purpose of these two studies was to test a serial mediation pathway in which occupational stressors influence perceived stress, which influences emotion-focused coping, which influences risk of depression. Additionally, the studies tested a moderating influence of the Dark Tetrad personalities on the stress appraisal process. Participants were recruited from two populations of nurses and were asked to respond to a series of questionnaires. Support for the serial mediation pathway was found in Study 1 but not Study 2. Additionally, a moderating effect of grandiose narcissism was found in Study 2 but not Study 1, such that those high in grandiose narcissism were less likely to appraise stressors as stressful. No other findings were significant, suggesting that the Dark Tetrad does not influence stress appraisal. However, future research should use a larger sample size and longer timeframe to further explore these findings.

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Literature Review

Introduction

Work is a significant stressor in many people's lives. According to the American Psychological Association (2023), 77% of employees report having experienced work-related stress over the past month. Stress can negatively impact important work outcomes, such as performance, absenteeism, and turnover (Chu & Kao, 2005;; Spector, 2005; Yu et al., 2007). Indeed, around 40% of job turnover occurs because of stress (Hoel et al., 2001). Further, experiencing stress at work has been linked to negative physical (e.g., headaches) and mental (e.g., depression) health outcomes (Chu & Kao, 2005; Melchior et al., 2007). Employees who report high levels of stress spend 50% more on healthcare expenditures (O'Keefe et al., 2014). These negative outcomes of stress are also costly to organizations. Overall, American companies lose over $300 billion each year due to the healthcare costs, lost productivity, and absenteeism associated with job stress (University of Massachusetts Lowell, n.d.).

Given these deleterious effects, much research has been conducted investigating the theoretical and empirical underpinnings of work-related stress. However, not all individuals are affected by work stress in the same way. Individual differences seem to play a role in how one interprets, responds to, and copes with workplace stressors as well as the likelihood of strain outcomes (e.g., Javaras et al., 2012; Karademas & Kalantzi-Azizi, 2004; Leger et al., 2016; Luo et al., 2024; Ng et al., 2014). These differences in stress responses and overall outcomes often stem from variations in genetic makeup, personality, and other traits such as locus of control, self-efficacy, and resilience (e.g., Evers et al., 2000; Gore et al., 2016; Javaras et al., 2012; Mezgebu et al., 2020; Weston et al., 2015). Personality has received lots of attention as an individual difference variable in the stress literature. While it is most often studied using the Big

Five personality framework (e.g., Grant & Langan-Fox, 2006), other conceptualizations of personality have been developed to address more malevolent aspects of human nature. One such conceptualization is the Dark Triad, which is a conglomeration of subclinical narcissism, subclinical psychopathy, and Machiavellianism (Paulhus & Williams, 2002). More recently, everyday sadism has been added to the group of traits, resulting in the new concept of the Dark Tetrad (Bonfá-Araujo et al., 2022). These personalities are said to share a common callous core, and a tendency towards manipulation, lack of empathy, deception, aggression, and self-promotion (Paulhus & Williams, 2002). The Dark Tetrad (DT) personalities are often considered undesirable in the workplace. All four of the DT personalities have been linked to unethical and harmful work behavior, as well as rudeness and incivility (DeShong et al., 2017; Thibault & Kelloway, 2020). The callous and self-interested nature of the DT personalities is also likely to create an abrasive impression on others in the organization and cause interpersonal conflict (Gómez-Leal et al., 2024).

The evidence on the effect of Dark Tetrad personalities on stress is sparse and conflicting. Some research suggests that the DT serves as a buffer against the adverse impact of stress. For instance, some studies find that some or all of the DT personalities enjoy greater longevity and decreased psychopathology (Papageorgiou et al., 2019). However, other studies argue that the DT leads to negative stress outcomes (e.g., Aghababaei & Błachnio, 2015; Jonason et al., 2015; Richardson & Boag, 2016). The purpose of this study is therefore to add clarity to the literature regarding whether possessing DT traits has a positive, negative, or neutral effect on one's experience of stress in the workplace and subsequent health outcomes.

The population of interest in this study is nurses. Nurses are an important population to study in the stress literature due to the high levels of stress and subsequent burnout seen in the

profession. Nursing is a taxing profession, both physically (e.g., long hours, heavy lifting, handling bodily fluids) and emotionally (e.g., dealing with illness and death, consoling distraught families; Nursing World, 2024). Given these aspects of the job, it comes as no surprise that burnout is very common in nursing; a recent study conducted by the American Nurses Association found that 62% of nurses in the U.S. experience burnout (Nursing World, 2024). A study by Bucknall et al. (2015) examined the prevalence of Dark Tetrad traits in healthcare professionals. Results indicated that healthcare workers scored significantly lower on narcissism, Machiavellianism and psychopathy than the general population. Furthermore, nurses scored higher on secondary psychopathy than medical professionals. Thus, I expect the sample in this study to be relatively low on all Dark Tetrad traits except for secondary psychopathy.

Theoretical Foundations

Work stress is the process by which individuals react to and handle work demands to meet multiple goals across time (Griffin & Clarke, 2011). When discussing stress, it is important to differentiate between stressors, which are the causes of stress, and strains, which are the immediate outcomes of stress (e.g., Caplan et al., 1980; Kahn et al., 1964). Stressors refer to the demands that an individual faces, while strains refer to the negative outcomes of stress on health and wellbeing (Kahn & Byosiere, 1992).

Several models have been proposed to explain the stress process, such as Conservation of Resources Theory (Hobfoll, 1989), Job Demands Resources Theory (Bakker & Demerouti, 2007), and the Demands Control Model (Karasek, 1979, 1989), to name a few. Griffin & Clarke (2011) integrated the underlying principles of most stress models into one framework that encompasses both the short-term and long-term dynamics of the stress process, including its reciprocal impact on the person, the environment, and outcomes (Griffin & Clarke, 2011). In this

model, the stress process is both transactional and dynamic. Stress is a transactional process in which the person and the environment both play a role in a person's experience of stress – the environment presents a stressor, and the person appraises and responds to this stressor. Stress is also a dynamic process; the association between person and environment takes place over time and is influenced by both person and environment. Through this dynamic process, the model incorporates causal chains and feedback loops.

The transactional and dynamic processes describe and explain an individual's experience of stress and how this experience unfolds over time (Griffin & Clarke, 2011). The environment refers to job characteristics, which can be task-related, role-specific, social, or physical, that serve as potential stressors (Griffin & Clarke, 2011). Characteristics of the person refer to the stable dispositional factors, such as an individual's personality, values, skills, and abilities (Griffin & Clarke, 2011). When encountering a stressor, these characteristics impact a person's appraisal of and response to the stressor, as well as their risk of experiencing long-term stress outcomes (Griffin & Clarke, 2011).

In the appraisal process, the person perceives the environmental stimulus (stressor) (Griffin & Clarke, 2011). Perceived stress is the degree to which a person appraises their external environment as stressful (Griffin & Clarke, 2011). Specifically, they determine whether they have sufficient resources to cope with the environmental demands. If the individual perceives that their resources are insufficient to meet the demands, strain occurs. Perceived stress is influenced by the person's characteristics and the characteristics of the environment (Griffin & Clarke, 2011). Take for instance an employee who is assigned a time-consuming and difficult project at work. If the employee knows their coworkers will help them with the project (aspect of the environment) or has high self-efficacy (aspect of the individual), they will likely be confident

in their ability to handle the project and therefore not appraise it as stressful (Karademas & Kalantzi-Azizi, 2004). However, if the employee knows they must handle it alone (aspect of the environment) or has low self-efficacy (aspect of the individual), they will likely feel unequipped to handle the project and therefore appraise it as stressful (Karademas & Kalantzi-Azizi, 2004).

The person's appraisal of the stressor then influences their goal processes (Griffin & Clarke, 2011). Goal processes are ways of decreasing the perceived discrepancy between one's current state and a desired end state (Austin & Vancouver, 1996). A key distinction is the difference between approach and avoidance behavior towards goals (Elliot, 2006). Approach goals involve moving towards a positive stimulus (pursuing a positive outcome), while avoidance goals involve moving away from a negative stimulus (avoiding a negative outcome) (Elliot, 2006). Approach goals are usually chosen if a person appraised the environment positively, while avoidance goals are usually chosen if a person appraised the environment as a threat (Griffin & Clarke, 2011). For instance, if an employee appraises a difficult project positively, they will likely work on it to glean the rewards of its accomplishment, such as receiving positive feedback from their supervisor. However, if an employee appraises a difficult project negatively, they will likely work on it for fear of the potential repercussions of not completing the project, such as receiving negative feedback from their supervisor.

In the response process, an individual's appraisal of the environment and their activation of goal processes influences how they respond to stressors in the short-term (Griffin & Clarke, 2011). These responses can be physical (e.g., headaches), behavioral (e.g., counterproductive work behavior), or affective (e.g., negative affect). Responses can also be categorized as reactive or active (Griffin & Clarke, 2011). Reactive responses are ones that are largely a consequence of the stress process. These are generally acute but can accumulate and thereby influence long-term

health outcomes. Typically, physiological and affective responses to stress are considered reactive. Active responses, on the other hand, aim to directly influence the stress process. Coping behaviors are aimed at the stressor itself and are therefore generally considered active (Lazarus & Folkman, 1984).

Coping refers to the conscious thoughts and actions that a person uses to overcome stressful circumstances (Campbell-Sills et al., 2006). People typically engage in one of three different forms of coping: problem-focused coping, emotion-focused coping, or meaning-focused coping (Folkman & Lazarus, 1988). Problem-focused coping strategies are ones in which a person uses deliberate, practical strategies to reduce or eliminate the stressor itself (Weber et al., 2023). For example, an employee who experiences conflict with a coworker might reach out to their coworker to settle the argument. Emotion-focused strategies are ones in which a person focuses on making themselves feel less stressed, typically through avoidance, self-deception, or self-blame (Weber et al., 2023). Continuing with the previous example, an employee who experiences conflict with a coworker might vent to a friend about the frustrating situation. Meaning-focused coping involves changing one's thoughts of the stressor and finding purpose in it by reframing one's views (positive reappraisal) (Folkman & Lazarus, 1988). For instance, an employee might reframe their conflict with a coworker; they might transition from viewing it as a personal injustice to viewing it as an opportunity to work on their communication skills and see another person's perspective.

The coping style an individual chooses in response to a stressor greatly influences their likelihood of experiencing positive or negative outcomes of stress (Cheng et al., 2024). Coping therefore mediates the relationship between stressors and their outcomes in the stress process. A meta-analysis on coping strategies found that problem-focused and meaning-focused coping

decreased anxiety and depression symptoms, while emotion-focused coping increased anxiety and depression symptoms (Cheng et al., 2024; Karademas & Kalantzi-Azizi, 2004). Thus, emotion-focused coping, while potentially helpful in the short-term, does not lessen the experience of stress in the long-term (Weber et al., 2023).

Stress can have long-term negative impacts on health (physical), wellbeing (psychological), and performance (behavioral) outcomes. For instance, an employee who faces an overwhelming workload and perceives this as stressful might develop heart disease in the long run (Chandola et al., 2006). Their mental health might also suffer, leading to the development of depression or anxiety (Melchior et al., 2007). Lastly, their stress could manifest itself in behavioral ways such as skipping work (Chu & Kao, 2005) or consuming excessive alcohol (Kouvonen et al., 2005).

The Griffin and Clarke (2011) model has a long cycle in which the environment and stable characteristics of the person influence each other over time. The model also focuses on how the processes unfold over shorter time frames in which appraisal, goal orientation, and responses quickly occur when an individual faces a stressor. Lastly, the framework is cyclical: The environment and person come together to influence the short-term dynamics of appraisal, goal orientation, and responses. These short-term dynamics then accumulate, leading to long-term outcomes in health, psychological wellbeing, and performance. For instance, frequent high heart rate (i.e., short-term response) in response to stress can lead to cardiovascular disease in the long run (Perret-Guillaume et al., 2009). Similarly, perceived stress has been linked to increased psychopathology (Lee et al., 2013; Sandal et al., 2017; Parrish et al., 2011). The long-term outcomes of stress then influence the short-term dynamics between the environment and the person. For instance, if an individual engages in counterproductive work behavior (CWB) in the

long run due to stress, they might be perceived negatively by their coworkers due to this behavior, leading to decreased social support (change in environment). On the other hand, an individual who develops migraines due to stress might experience a decrease in their ability to focus at work (change in person) (American Migraine Foundation, 2018). Lastly, if a person becomes afflicted by depression due to stress, their short-term appraisal of future stressors might become more negative due to their low mood (Folkman & Lazarus, 1986). Griffin and Clarke's (2011) model can be used to identify the outcomes of stress, predictors of stress, and the individual differences that impact the stress process, such as the Dark Tetrad.

Strain

As mentioned above, when people experience prolonged work-related stress and are unable to successfully cope with and recover from it, the stress can lead to adverse behavioral, physical, and psychological health outcomes (e.g., Melchior et al., 2007). These primary, negative outcomes of stress are known as strains (Caplan et al., 1980). In terms of behavioral outcomes, work-related stress has been consistently linked to performance. The relationship between work stress and performance varies for task performance (activities that appear in formal job descriptions) and contextual performance (activities that do not appear in formal job descriptions and for which an employee is not formally rewarded) (Motowidlo, 2003). Work stress has been consistently linked to negative outcomes for contextual performance, including absenteeism, turnover, decreased job satisfaction, and counterproductive work behavior (Chu & Kao, 2005; Yu et al., 2007; Spector, 2005). Stress has also been linked to unsafe behavior and is thought to be responsible for 60–80% of all workplace accidents (Cartwright & Cooper, 1996).

The impact of work stress on task performance, on the other hand, can be positive or negative, depending on the individual's appraisal of the stressor. This differential impact of work

stress on task performance is best noted in the challenge-hindrance model of stress (LePine et al., 2005). This model argues that stressors can be perceived as either challenges or hindrances. If a person appraises a stressor as challenging, they experience positive emotions and are more likely to use active coping strategies, such as problem solving. They are also likely to experience an increase in motivation, leading to improved task performance (Wallace et al., 2009) and greater job satisfaction (Cavanaugh et al., 2000). Stressors which are likely to be appraised as challenging are job demands, role demands, pressure, high workload, and deadlines (LePine et al., 2005). On the other hand, if a person appraises a stressor as a hindrance, they experience negative emotions and are more likely to use passive (emotion-focused) coping strategies (LePine et al., 2005). Job constraints, hassles, role conflict, role ambiguity, role overload, interpersonal conflict, and organizational politics are often appraised as hindrance stressors (Griffin & Clarke, 2011). Such stressors lead to a decrease in motivation because people do not believe that any efforts to overcome the stressor are likely to lead to success. Thus, hindrance stressors are linked to decreased task performance (Wallace et al., 2009) and decreased job satisfaction (Cavanaugh et al., 2000).

Work-related stress can impact physical health in three ways: indirectly via its effect on behavior, indirectly via its effect on affect, or directly. Work-related stress can lead to poor coping behaviors like binge eating (Razzoli, 2017), substance use (Wand, 2008; Sinha, 2008), alcohol consumption, and smoking (Kouvonen et al., 2005). Such behaviors can be detrimental to one's health and lead to a variety of physical health problems, including Binge Eating Disorder (BED; Razzoli, 2017), substance or drug addiction (NIDA, 2018; 2022), cancer, cardiovascular disease, liver disease, diabetes (Rehm, 2011), and lung cancer (e.g., Alberg & Samet 2003).

Work-related stress can also impact physical health through its influence on negative affect. Studies have found that people who experience high levels of stressor-related negative affect are more likely to develop chronic health conditions, be in poor physical health, and experience decreased longevity (Leger et al., 2018; Piazza et al. 2013; Mroczek et al., 2015). Stressor-related negative affect has also been linked to decreased cortisol function and greater rates of heart disease (Kern & Friedman, 2011).

Lastly, work-related stress can influence physical health directly. These direct outcomes include increased risk of Type II diabetes (Chandola et al., 2006), heart disease (Chandola et al., 2006), musculoskeletal diseases (Carayon et al., 1999), and a weakened immune system (Segerstrom & Miller, 2004). Perceptions of stress have also been linked to headaches, high blood pressure, fatigue, and body pain (Chu & Kao, 2005; Yu et al., 2007; Gao et al., 2022). Furthermore, work-related stress has been linked to memory disturbances and poor sleep (Mayerl et al., 2016; Neupane & Nygard, 2017).

Finally, work-related stressors have been consistently linked to the experience of poor psychological outcomes. Many studies have found a link between perceptions of stress and nervousness, irritability, anxiety, depressive feelings, and negative affect (Chu & Kao, 2005; Mayerl et al., 2016; Yu et al., 2007; Gao et al., 2022; Leger et al., 2016). One psychological outcome of stress that has received significant attention in the literature is burnout (Griffin & Clarke, 2011). Burnout can be thought of as a long-term outcome of job stress that occurs when a person faces excessive job demands without adequate resources to cope with those demands (Schaufeli & Bakker, 2004). Burnout is characterized by three dimensions: emotional exhaustion, depersonalization, and decreased personal accomplishment. Emotional exhaustion is a feeling of being emotionally depleted, depersonalization refers to cynicism and detachment

from one's environment, and decreased personal accomplishment is a decrease in feelings of competence and productivity (Maslach, 1998). These dimensions are thought to be related in a causal manner, wherein emotional exhaustion leads to detachment behavior, cynicism, and depersonalization, which collectively lead to decreased feelings of efficacy over time (Schaufeli & Bakker, 2004).

Much like burnout , several studies have linked work-related stress to increased depression (Melchior et al., 2007; Cohen et al., 2005).. Per the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM–5; American Psychiatric Association, 2013), a diagnosis of depression necessitates persistent negative affect or loss of pleasure. Symptoms of depression include sleeping and eating disturbances, feelings of worthlessness, low mood, and suicidal ideation (American Psychiatric Association, 2013). Many people experience depression. Approximately 8.4% of the American population had at least one major depressive episode in 2020 (Substance Abuse and Mental Health Services Administration, 2021).

Most individuals who develop depression do so after facing a major life stressor (Hammen, 2005), making stressors one of the strongest indicators of the likelihood of developing depression (Monroe & Reid, 2009). In fact, a cohort study found that individuals who experienced high work stress were twice as likely to develop symptoms of depression or anxiety as compared to individuals who experienced minimal work stress (Melchior et al., 2007). This relationship between stressors and risk for depression is mediated by perceived stress (Lee et al., 2013; Sandal et al., 2017; Parrish et al., 2011). Mediation is a statistical relationship in which A influences C via its effects on B (Baron & Kenny, 1986). A (in this case, stressors) is therefore directly related to B (in this case, perceived stress), B (perceived stress) is directly related to C

(depression), and A (stressors) is indirectly related to C (depression) via its effects on B (perceived stress).

I have chosen depression as my outcome of interest due to its large scope of impact on both individual and organizational wellbeing. Depression, while being a psychological strain, can have a detrimental effect on individual wellbeing, performance, and organizational effectiveness (e.g., Mayo Clinic, 2022, Stewart et al., 2003, Melchior et al., 2007). People who suffer depression are more likely to develop physical health complications, such as obesity, pain, heart disease, diabetes, osteoporosis, Alzheimer's disease, and stroke (Mayo Clinic, 2022; National Institutes of Health, 2024). This may be because depression symptoms like fatigue make it difficult for individuals to engage in healthy habits (exercising, eating nutritiously, etc.) and avoid unhealthy ones (substance abuse, social isolation, self-mutilation, etc.) (Mayo Foundation for Medical Education and Research, 2022; U.S. Department of Health and Human Services, 2024). Depression has also been associated with an inability to focus, difficulty completing tasks and meeting deadlines, procrastination, loss of motivation, decline in problem-solving skills, withdrawal from coworkers, and increased absenteeism, all of which can lead to decreased performance (Birnbaum et al., 2010). Furthermore, the more severe the depression, the greater the detriments to performance (Beck et al., 2011).

Depression-related declines in performance, along with the influence of depression on healthcare expenditures, can be financially draining for organizations. Depression accounts for approximately 200 million lost workdays each year, costing employers $17 to $44 billion annually (Stewart et al., 2003). Depression can even be as costly as heart disease or AIDS, costing the American economy more than $51 billion in absenteeism and lost productivity and $26 billion in treatment costs (Greenberg et al., 2003). Overall, stress is a major precursor to

depression, and depression comes with grave costs to the individual and the organization, which makes it an important strain to study in the workplace. Stressors lead to greater perceived stress, which increases an individual's risk of depression (Lee et al., 2013; Sandal et al., 2017; Parrish et al., 2011). Furthermore, use of emotion-focused coping strategies has been linked to an elevated risk of depression (Cheng et al., 2024; Karademas & Kalantzi-Azizi, 2004). Thus, stressors are predicted to lead to greater perceived stress and emotion-focused coping, which leads to an increased risk of depression. This leads to the following hypothesis:

Hypothesis 1: Stressors will have an indirect effect via serial mediation on depression (strain) through perceived stress and emotion-focused coping.

Predictors

Several factors influence how a person responds to a perceived stressor and thus the effects of stress on their wellbeing and performance in the long run. These factors include coping style and level of social support. Individual differences, such as personality, resilience, locus of control, and self-efficacy, also play a critical role in this process. Each of these is briefly discussed below.

Social support

Social support has been defined as "an exchange of resources between two individuals perceived by the provider or the recipient to be intended to enhance the wellbeing of the recipient" (Shumaker & Brownell 1984, 11). Social support has a main effect on wellbeing; that is, it directly leads to better mental and physical health (Cohen, 1985). Additionally social support has a buffering effect in that it diminishes the negative effects of poor stress responses on long-term health (Cohen, 1985). Social support can moderate the relationship between subjective perceptions of stress and negative short-term responses by making the stressor seem less

threatening or increasing a person's confidence in their ability to handle the stressor (Cohen & Willis, 1985).

Individual differences

Resilience. Resilience is often defined as a person's ability to recover from difficult events and stressful experiences (Gao et al., 2022). Like social support, resilience is thought to buffer against the negative effects of stress on mental wellbeing, specifically by protecting against depression (Mezgebu et al., 2020). Resilience also protects individuals from negative stress outcomes through its links with coping style (Gao et al., 2022). Individuals higher in resilience are more likely to engage in adaptive coping, while those who are lower in resilience are more likely to use maladaptive coping strategies (Gao et al., 2022).

Locus of control. Another individual difference variable influencing stress appraisal, coping, and outcomes is locus of control. Locus of control refers to a person's perception of the causes of events in their life and can be internal or external (Rotter, 1966). Individuals with an internal locus of control believe that they have control over the outcome of their situation, while those with an external locus of control believe that events are largely dependent on luck, chance, or the actions of others (Rotter, 1966). People with an internal locus of control are less likely to perceive stressors as threatening and are more likely to deal with them by using problem-focused coping, meaning-focused coping, or social support (Kahn & Byosiere, 1992; Gianakos, 2022; Gore et al., 2016). Consequently, an internal locus of control has been linked to more positive long-term outcomes including mental wellbeing, physical health, and decreased burnout (Ng et al., 2014). An external locus of control, on the other hand, has been linked to greater perceived stress, use of avoidance coping, and poor health outcomes (Evers et al., 2000; Gore et al., 2016).

Self-efficacy. Self-efficacy has been defined as the extent to which a person believes themselves capable of achieving a desired outcome (Bandura, 1986). Self-efficacy influences a person's beliefs about their ability to effectively cope with vague, unpredictable, and stressful situations (Bandura et al., 1985). In fact, what causes a situation to be perceived as stressful is largely a person's perceived inability to deal with the stressor rather than the characteristics of the stressor itself (Bandura et al., 1985). Self-efficacy also impacts how a person copes with the stress and their risk of strain. People with low self-efficacy tend to use emotion-focused coping strategies and experience greater strains such as anxiety, depression, and psychosomatic symptoms (Terry, 1994; Bandura, 1997; Kavanagh, 1992; O'Leary, 1992). People with high self-efficacy, on the other hand, tend to use problem-focused coping and experience better mental and physical health outcomes (Bandura, 1977; Brown et al., 2014).

It is important to note that many studies on the relationship between self-efficacy and stress use context-specific self-efficacy. For instance, a study on stress in students facing exams used academic self-efficacy to determine associations between self-efficacy and stress responses (Karademas & Kalantzi-Azizi, 2004). Thus, it is important to consider self-efficacy at work rather than generalized self-efficacy when examining the appraisal, responses, and outcomes of work stress (Fürtjes et al., 2023).

Personality. The literature on stress has consistently identified links between personality and the entire stress process. Personality is commonly conceptualized and measured using the Big Five personality traits, these being conscientiousness, extraversion, agreeableness, neuroticism, and openness to experience (Costa & McCrae, 1992; John & Srivastava, 1999). Studies have linked neuroticism to a more threatening appraisal of stressors and greater negative affect in the face of stress (Kaiseler et al., 2012; Leger et al., 2016). People high in neuroticism

are also more likely to engage in emotion-focused coping (Kwarta et al., 2016), and experience strains such as depression (Hakulinen et al., 2015), burnout (Zellars et al., 2000), chronic disease onset (Weston et al., 2015), and even mortality (Roberts et al., 2007).

Conscientiousness, extraversion, agreeableness, openness, on the other hand, are correlated with a less stressful appraisal of stressors and lower negative affect in the face of stress (Javaras et al., 2012; Kaiseler et al., 2012; Luo et al., 2017). Furthermore, people high in conscientiousness, extraversion, and openness are more likely to engage in problem-focused coping (Kwarta et al., 2016; Penley & Tomaka, 2002). Those high in agreeableness and extraversion are also more likely to use social support in coping with stress, likely due to the emphasis such personalities place on connecting with others (McRae & John, 1992; Carver & Connor-Smith, 2010). Finally, conscientiousness has been consistently negatively linked to poor mental health outcomes such as depression and anxiety (Javaras et al., 2012).

While research has typically used the five-factor model as the dominant personality model in stress research, studies have examined other traits as well, including those comprising the Dark Tetrad.

The Dark Tetrad

The Dark Tetrad is composed of narcissism, psychopathy, Machiavellianism, and sadism (Bonfá-Araujo et al., 2022; Paulhus & Williams, 2002). These personalities are said to share a common callous core, and a tendency towards manipulation, lack of empathy, deception, aggression, and self-promotion (Paulhus & Williams, 2002). For the purposes of this study, I am only concerned with subclinical levels of each of these traits as they occur in the population.

Research on the stress responses and outcomes of the Dark Tetrad is conflicting and, particularly for sadism, sparse. Generally, psychopathy has been associated with lower life

expectancy, while narcissism with a longer life expectancy (Jonason et al., 2015). No associations have been found for Machiavellianism and sadism (Jonason et al., 2015). The potential positive health outcomes that narcissists enjoy, as compared to the rest of the Dark Tetrad, might be due to differences in stress appraisal and coping (Birkás et al., 2016). Each facet of the DT and its relation to stress is discussed in detail below.

Narcissism

Narcissism is a personality trait that is characterized by an inflated view of self, illusions of grandiosity, a sense of entitlement, a wish for power, a tendency to manipulate others, and low capacity for empathy (Campbell et al., 2006). Additionally, those high in narcissism tend to have a friendly yet assertive interpersonal style, high self-control, and high self-efficacy (Jonason & Tost, 2010; Rauthmann & Kolar, 2013; Szijjarto & Bereczkei, 2014; Wu et al., 2019). Narcissism has been further categorized into two subtypes, these being grandiose and vulnerable. Grandiose narcissists have a propensity towards exhibitionism, arrogance, and dominance over others, and high self-esteem (Papageorgiou, 2019; Ng et al., 2014). Vulnerable narcissists, on the other hand, tend to display negative affect, selfishness, mistrust, attention-seeking behavior, and lower self-esteem than grandiose narcissists (Papageorgiou et al., 2019). A recent conceptualization of narcissism sheds more light on the subtypes by identifying three components of narcissism: agentic extraversion, neuroticism, and antagonism (Back & Morf, 2017; Krizan & Herlache, 2018; Miller et al., 2016). Agentic extraversion refers to extraversion and dominance, neuroticism refers to negative emotionality and the need for admiration, and antagonism refers to low agreeableness and exploitation (Back & Morf, 2017; Krizan & Herlache, 2018; Miller et al., 2016). Grandiose narcissism is thought to consist of agentic

extraversion and antagonism, while vulnerable narcissism consists of antagonism and neuroticism (Back & Morf, 2017; Krizan & Herlache, 2018. Miller et al., 2016).

The research linking narcissism to stress appraisal is slightly conflicting. Several studies show that narcissistic individuals are highly sensitive to perceived inequity, ego threat, and antagonism from others (Hopwood et al., 2011; Campbell et al., 2010), and are more likely to view themselves as victims of interpersonal conflicts with others (McCullough et al., 2003). This heightened reactivity to threats is likely due to their inflated view of self and vulnerability to threat (Kealy & Rasmussen, 2012; Morf & Rhodewalt, 2001). Individuals high in narcissism might be especially sensitive to stressors that could undermine their sense of control and expose them to the risk of failure, which would contradict their inflated view of self (Noser et al., 2014). However, other findings contradict this notion. Several studies have found that narcissism is associated with reduced emotional reactivity to stress (Birkas et al., 2016; Onley et al., 2013) or found no effect for narcissism on stress reactivity (Noser et al., 2014). It may be that most stressors are not severe enough to undermine narcissist's sense of control, and so are appraised as nonthreatening (Pincus & Lukowitsky, 2010; Noser et al., 2014). However, those stressors that are severe enough to create a loss of control and failure might be appraised as threats by narcissists (Noser et al., 2014).

The findings on narcissism and stress appraisal become more clear-cut when differentiating between the grandiose and vulnerable subtypes. Vulnerable narcissism is associated with increased perceived stress, while grandiose narcissism is associated with decreased perceived stress (Kajonius & Björkman, 2018; Ng et al., 2014; Papageorgiou, 2019). These differences likely stem from differences in self-esteem. Grandiose narcissism is marked by high self-esteem, which can buffer against perceived stress by making a person feel more

capable of overcoming the stressor (Ng et al., 2014; Papageorgiou, 2019). Vulnerable narcissism, on the other hand, is marked by low self-esteem which might leave those with this personality trait more likely to appraise stressors as insurmountable and therefore threatening (Ng et al., 2014; Papageorgiou, 2019). Additionally, the association between neuroticism and vulnerable narcissism might explain the negative appraisal pattern of those with vulnerable narcissism (Back & Morf, 2017; Krizan & Herlache, 2018; Miller et al., 2016).

Narcissism not only influences stress appraisal but also stress responses, including coping style. This influence has been noted in both positive and negative ways in the literature. On the one hand, narcissism has been linked to effective coping strategies such as problem-focused coping (Birkás et al., 2016) and positive reappraisal (Folkman & Moskowitz, 2004; Birkás et al., 2016), and lack of emotion-focused coping. The effective coping styles seen in narcissist might be explained by their high level of self-control which lends itself well to emotional regulation and problem-focused coping (Jonason & Tost, 2010). Narcissism is also the only Dark Triad personality that is positively linked to seeking social support, likely due to the value narcissists place on social interaction (Jonason et al., 2020). These findings suggest that narcissists utilize problem-focused strategies and social support over emotion-focused strategies to deal with stressors directly, which increases their likelihood of overcoming the stressor (Cheng et al., 2024; Karademas & Kalantzi-Azizi, 2004).

However, narcissism has also been linked to negative stress responses. Narcissism, along with along with the rest of the Dark Tetrad, has been linked to the general construct of destructive coping, defined as coping which leads to negative outcomes (Jonason et al., 2020). Narcissism has also been linked to aggression when progress towards goals is impeded (e.g., Rhodewalt & Morf, 1998). Similarly, narcissism is highly related to engaging in CWB, typically

in response to ego threat, rejection by others, feelings of inequity, or job constraints (Bushman & Baumeister, 1998; Twenge & Campbell, 2003; Penney & Spector, 2002; Palmer et al., 2017; Campbell et al., 2010). This tendency likely stems from the inflated view of self, sense of entitlement, and dominance that is characteristic of narcissism (Paulhus & Williams, 2002).

In addition to stress appraisal and responses, narcissism has been linked to stress outcomes in conflicting ways. Several studies have found a negative association between narcissism and poor mental health outcomes such as anxiety, depression, psychosis (Lyons et al., 2019; Sedikides et al., 2004; Zuckerman & O'Laughlin, 2009) and burnout (Prusik & Szulawski, 2019). However, other studies have found a positive association between narcissism and burnout (Schwarzkopf et al., 2016; Barnett & Flores, 2016). Additionally, several studies have linked narcissism to elevated cortisol, which is an indicator of a chronically activated stress response (Cheng et al., 2013; Edelstein et al., 2010).

Once again, the research becomes clearer when looking at the subtypes of narcissism. Grandiose narcissism is positively associated with life satisfaction and negatively associated with depression and anxiety (Ng et al., 2014; Papageorgiou, 2019). Vulnerable narcissism, on the other hand, is negatively associated with life satisfaction and positively associated with depression and anxiety (Ng et al., 2014; Papageorgiou, 2019). The neuroticism seen in vulnerable narcissism might explain the association between vulnerable narcissism and poor mental health outcomes (Back & Morf, 2017; Krizan & Herlache, 2018. Miller et al., 2016). Taken together, these findings suggest that vulnerable and grandiose narcissism influence the stress process in unique ways. Grandiose narcissists will likely perceive stress less often. That is, grandiose narcissism is predicted to moderate the relationship between stressors and appraisal (perceived stress), such that it makes stressors appear less threatening and more manageable,

leading to decreased perceived stress. Furthermore, grandiose narcissists will choose effective coping strategies like problem-focused coping, positive reappraisal, and social support, over ineffective ones such as emotion-focused coping. Thus, grandiose narcissists will likely be at a lower risk of depression in the long-run due to their positive stress appraisal and effective coping strategies. This leads to the following hypothesis:

Hypothesis 2: Grandiose narcissism moderates the serial mediation between stressors and depression through stress appraisal (perceived stress) and emotion-focused coping, such that those high in grandiose narcissism will be less likely to appraise stressors as stressful.

Vulnerable narcissists, on the other hand, will likely perceive stress more often. That is, vulnerable narcissism is predicted to moderate the relationship between stressors and appraisal (perceived stress), such that vulnerable narcissism makes stressors appear more threatening and out of control, leading to increased perceived stress. Furthermore, vulnerable narcissists will likely engage in less effective coping strategies, such as emotion-focused coping, to manage stressors. Thus, vulnerable narcissists will likely be at a greater risk of depression in the long-run due to their negative stress appraisal and poor coping strategies.

Hypothesis 3: Vulnerable narcissism moderates the serial mediation between stressors and depression through stress appraisal (perceived stress) and emotion-focused coping, such that those high in vulnerable narcissism will be more likely to appraise stressors as stressful.

Psychopathy

The second DT personality trait is psychopathy, which is characterized by impulsivity, dishonesty, irresponsibility, lack of empathy, superficial emotional reactions, and a tendency towards antisocial and criminal behavior (Paulhus & Williams, 2002; Anderson & Kiehl, 2014). People high in psychopathy tend to have a dominant and hostile interpersonal style, low self-

control, and little regard for social norms (Jonason & Tost, 2010; Rauthmann & Kolar, 2013; Szijjarto & Bereczkei, 2014). Furthermore, people high in psychopathy typically expect to receive positive outcomes for their efforts, thereby indicating that they, like narcissists, have high self-efficacy (Wu et al., 2019).

Psychopathy has been further differentiated into two subtypes: primary psychopathy and secondary psychopathy (Levenson et al., 1995). Primary psychopathy is characterized by cold-heartedness, shallow affect, superficial charm, and low anxiety (Patrick, 1994; Benning et al., 2005). Secondary psychopathy, on the other hand, is characterized by impulsivity, anti-social and hostile behavior, and high anxiety (Patrick, 1994; Benning et al., 2005).

Psychopathy has been linked to increased perceived stress (Diedenhofen & Musch, 2015; Wendt & Bartoli, 2019). This may be explained by the low positive affect and low empathy seen in psychopathy (Egan et al., 2014). Positive affect (Kopala-Sibley et al., 2016) and empathy (Armstrong et al., 2011) have been thought to moderate the relationship between stressors and stress appraisal to create a more positive appraisal of stressors. The link between psychopathy and greater perceived stress might therefore be explained by a lack of these protective traits (Lyons et al., 2019). However, a different study found that psychopathy is associated with decreased perceived stress (Kajonius & Björkman, 2018). The authors theorized that the lack of empathy and high self-esteem seen in psychopathy serve as protective factors against perceived stress; these factors might contribute to an individual simply caring less about their environment and therefore being unaffected by it (Kajonius & Björkman, 2018).

The findings on stress appraisal are clearer when psychopathy is examined by subtype. Secondary psychopathy is associated with greater perceived stress than primary psychopathy (Diedenhofen & Musch, 2015; Dalkner et al., 2018; Eisenbarth et al., 2019). These findings are

in line with the greater anxiety seen in secondary psychopathy, which lends itself to a greater likelihood of appraising a stressor as threatening (Wendt & Bartoli, 2019).

Psychopathy also influences responses to stress such as affect, aggression, and coping style. Several studies have linked psychopathy to affective reactions to perceived stress, particularly in the form of anger and irritability (e.g., Noser et al., 2014; Birkas et al., 2016; Onley et al., 2013; Lyons et al., 2019; Wendt & Bartoli, 2019). Furthermore, those high in psychopathy are more likely to experience distress and negative affect in response to a stressor (Lyons et al., 2019; Birkas et al., 2016). One study also found that psychopathy moderates the relationship between perceived stress and affective responses, such that psychopathy makes a person more likely to experience decreased positive affect in response to perceived stress (Noser et al., 2014).

Those high in psychopathy are also more likely to respond to stress with aggression (Cornell et al., 1996; Frick et al., 2003; Blair, 2010). This aggression is likely due to the reduced fear (Fowles, 1988), lack of impulse control (Jones & Paulhus, 2011; Cima & Raine, 2009), and low tolerance for frustration (Bettencourt et al., 2006; Blair, 2010) characteristic of psychopathy. Frustration refers to an emotional state that occurs when a person's progress towards their goals is thwarted (Spector, 1997). The combination of susceptibility to frustration, lack of impulse control, and reduced fear lends itself well to unplanned, emotional attacks on the perceived source of stress (Berkowitz, 1993; Cima & Raine, 2009).

In addition to the behavioral response of aggression, psychopathy has been linked to certain coping styles. Psychopathy is negatively associated with problem-focused coping and constructive coping (coping which leads to positive outcomes) (Birkás et al., 2016; Jonason et al., 2020). Psychopathy is also positively associated with emotion-focused coping, which

suggests that those high in psychopathy react emotionally to stressful events (Birkás et al., 2016; Saltoğlu & Uysal Irak, 2020).

Beyond stress appraisal and responses, psychopathy has also been linked to stress outcomes. Several studies have found links between psychopathy and negative mental health outcomes such as anxiety, depression, and psychosis (Aghababaei & Błachnio, 2015; Jonason et al., 2015; Láng et al., 2018; Love & Holder, 2014; Noser et al., 2014; Lyons et al., 2019). Psychopathy has also been positively related to burnout (Noser et al., 2014; Prusik & Szulawski, 2019) though some studies have found no association between psychopathy and burnout (Bartol et al., 1992; Richardson & Boag, 2016).

Taken together, these findings suggest that psychopathy will influence the stress process in a negative way. Psychopathy will likely moderate the relationship between stressors and appraisal (perceived stress) such that it makes stressors appear more threatening to goal progress (frustrating), leading to increased perceived stress. Furthermore, those high in psychopathy will likely engage in emotion-focused coping, particularly in the form of lashing out (aggression), to manage stressors. Psychopathy is therefore likely linked to a greater risk of depression in the long-run due to high perceived stress and poor coping strategies.

Hypothesis 4a: Psychopathy moderates the serial mediation between stressors and depression through stress appraisal (perceived stress) and emotion-focused coping, such that those high in psychopathy will be more likely to appraise stressors as stressful.

Machiavellianism

The third DT personality trait is Machiavellianism, which is characterized by a lack of empathy, muted emotional responses, flexible morals, and a tendency to lie, manipulate, and exploit others in the pursuit of self-serving interests (Christie & Geis, 1970). Individuals high in

Machiavellianism also display control, dominance, and ambition (Spain, 2019), and interact with others in a hostile-submissive manner (Birkás et al., 2016). Furthermore, Machiavellianism is associated with high self-efficacy as such individuals tend to believe they can achieve their ambitious goals (Zaman & Qayyum, 2020).

Machiavellianism has been linked to stress appraisal in a negative manner. Most studies link Machiavellianism to greater perceived stress (Heisler & Gemmill, 1977; Richardson & Boag, 2016; Diedenhofen & Musch, 2015; Wendt & Bartoli, 2019). As with psychopathy, this may be explained by the lack of positive affect and empathy seen in Machiavellianism, which are considered conducive to a more positive appraisal of stressors (Egan et al., 2014; Kopala-Sibley et al., 2016; Armstrong et al., 2011). However, other studies have found no association between Machiavellianism and perceived stress (Kajonius & Björkman, 2018; Noser et al., 2014). As with psychopathy, the authors theorized that the lack of empathy and high self-esteem seen in Machiavellianism serve as protective factors against perceived stress; these factors might contribute to an individual simply caring less about their environment and therefore being unaffected by it (Kajonius & Björkman, 2018).

Machiavellianism has also been linked to affective and behavioral responses to stress. Some studies have found a link between Machiavellianism and greater emotional reactivity to stress (Birkas et al., 2016; Onley et al., 2013). However, other studies have hypothesized that Machiavellianism might be associated with a decreased emotional reactivity to stress due to their cautious and deliberate nature (Williams et al., 2010; Jones & Paulhus, 2010). In terms of behavioral responses, Machiavellianism is positively associated with emotion-focused coping and negatively associated with problem-focused coping (Rim, 1992; Jonason et al., 2020; Heisler & Gemmill, 1977; Richardson & Boag, 2016). Furthermore, Machiavellianism is negatively

related to seeking social support (Birkás et al., 2016). Machiavellianism is generally associated with poor stress outcomes such as anxiety, depression, and psychosis (Aghababaei & Błachnio, 2015; Jonason et al., 2015; Láng et al., 2017; Love & Holder, 2014; Noser et al., 2014; Lyons et al., 2019; Kowalski et al., 2019). Machiavellianism has also been linked to burnout (Prusik & Szulawski, 2019).

Taken together, these findings suggest that Machiavellianism will generally influence the stress process in a negative way. Machiavellianism will likely moderate the relationship between stressors and appraisal (perceived stress), such that it makes stressors appear more threatening, leading to increased perceived stress. Furthermore, those high in Machiavellianism will likely engage in emotion-focused coping to manage stressors. Machiavellianism is therefore likely associated with a greater risk of depression in the long-run due to high perceived stress and poor coping strategies.

Hypothesis 5: Machiavellianism moderates the serial mediation between stressors and depression through stress appraisal (perceived stress) and emotion-focused coping, such that those high in Machiavellianism will be more likely to appraise stressors as stressful.

Sadism

The last and most recent addition to the DT personalities is sadism, which is characterized by callous emotional responses, lack of empathy, and a desire to hurt others, whether physically or emotionally, and a feeling of joy from seeing others in distress (Buckels et al., 2013). The evidence on sadism and stress appraisal is sparse. Sadism has been linked to greater psychological distress and poor self-reported wellbeing (e.g., pessimism, feeling overwhelmed) (Dinić et al., 2019). Sadism has also been linked to negative affect (Womick et al., 2018). Negative affect and feeling overwhelmed are associated with perceived stress (e.g.,

Yu et al., 2007; Gao et al., 2022; Leger et al., 2016), so it follows that sadism may be correlated with high perceived stress. The Big Five profile of sadism supports this prediction. Sadism has been linked to low agreeableness and low conscientiousness (Gómez-Leal et al., 2024). As discussed above, agreeableness and conscientiousness are associated with decreased perceived stress (Javaras et al., 2012; Kaiseler et al., 2012; Luo et al., 2017), so the absence of these traits in sadism might imply a more negative stress appraisal. Further support for this prediction is found in the lack of empathy characteristic of sadism (Buckels et al., 2013). As mentioned above, empathy is correlated with a positive stress appraisal, meaning its absence from the sadist personality might indicate a link between sadism and negative stress appraisal (Kopala-Sibley et al., 2016; Armstrong et al., 2011).

As with stress appraisal, there is little evidence on the influence of sadism on stress responses. However, everyday sadism has been consistently linked to a range of aggressive responses such as anger (Jonason et al., 2017), trait aggression (Buckels et al., 2018; Gibb, 2016), and proactive aggression (Dinić et al., 2019). Sadism has also been associated with workplace bullying (Thibault, 2016; Khan et al., 2023). Furthermore, sadism is associated with physical and sexual violence in intimate relationships (Tetreault et al., 2018; Fentem, 2018). These findings suggest that everyday sadism is associated with an aggressive response to conflict, which is a type of stressor (Oljača et al., 2020).

In terms of coping styles, sadism has been negatively linked to constructive coping (coping that leads to positive outcomes) (Jonason et al., 2020). Sadism has also been linked to harmful behaviors such as suicidal ideations (Chabrol et al., 2015; Oljača et al., 2020) and self-harm (Oljača et al., 2020), which indicate a maladaptive coping style. Lastly, sadism is linked to psychological and physical strains. Sadism is associated with poor mental health outcomes such

as anxiety and depression (Dinić et al., 2019; Oljača et al., 2020). Sadism is also associated with physical ailments (Oljača et al., 2020).

Although the research on sadism and stress responses is relatively lacking in comparison to its DT counterparts, the above findings suggest that sadism will generally influence the stress process in a negative way. Sadism will likely moderate the relationship between stressors and appraisal (perceived stress) such that it makes stressors appear more threatening, leading to increased perceived stress. Furthermore, those high in sadism will likely engage in ineffective coping strategies such as emotion-focused coping to manage stressors. Sadism is therefore likely to be linked to a greater risk of depression in the long-run due to high perceived stress and poor coping strategies.

Hypothesis 6: Sadism moderates the serial mediation between stressors and depression through stress appraisal (perceived stress) and emotion-focused coping, such that those high in sadism will be more likely to appraise stressors as stressful.

Study 1

Methods

Participants

The target population for this study was nurses because of the uniquely stressful nature of their occupation and the resulting high levels of burnout seen in nurses. The participants in this study were 163 nurses who were recruited using the Prolific software (www.prolific.com), an online participant recruiting platform. Participants had to be nurses working in the U.S., be 18 years or older, and be fluent in English to be eligible to participate. The survey was administered twice, once on a Friday afternoon, and again on the morning of the following Monday. The Friday afternoon survey was available on Prolific from 2pm to 11:59pm CST, and the Monday morning survey was available from 5am to 2pm CST. After completing the Day 1 (Friday) survey, participants were sent a message on Prolific thanking them for their participation and reminding them to complete the Day 2 (Monday) survey. For the Day 2 (Monday) survey, participants were only recruited from the pool of participants who had completed the Day 1 (Friday) survey.

Participants provided consent to participate via an online consent form before completing the surveys and were informed that all their data would remain anonymous. No identifiable participant information was collected. Participants were compensated at a rate of $3.00 per survey and received a bonus of $1.00 for completing both surveys. Participants could therefore earn $7.00 total. Completion of both surveys was tracked using Prolific IDs. These IDs were then used to distribute a bonus of payment of $1.00 to the participants that completed both surveys.

The average age of participants was 39 (*SD* = 11.9), and the majority (80.6%) were female. The sample was 56.3% White, 25.1% Black, 8.4% Asian, and 6.6% multiracial. All

participants resided in the U.S. The majority (68.9%) of participants reported having children. Participants reported working an average of 38.9 hours per week (*SD* = 8.04) and held a variety of nursing licenses, with the two most common licenses being an RN license (71.9% of participants) followed by an LPN/LVN license (17.4% of participants). The median completion time was 10.23 minutes for the Day 1 survey and 8.57 minutes for the Day 2 survey.

Based on an *a priori* power analysis using WebPower with small effect sizes for all relationships except the relationship between narcissism and perceived stress and the relationship between emotion-focused coping and depression (which were medium effect sizes), it was determined that a sample size of 162 was needed to reach a power of .80 or higher, so my sample size of 163 was deemed sufficient to test for significance in all relationships of the model.

Materials

Machiavellianism, psychopathy, and sadism. I used Thibault and Kelloway (2020)'s Dark Tetrad at Work (DTW) scale to measure Machiavellianism, psychopathy, and sadism. The DTW does not differentiate between grandiose and vulnerable narcissism, so I excluded the six narcissism items in my use of the scale. Instead, a separate measure was used to measure narcissism (see next section). The DTW has 22 items and uses a 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*). Psychopathy and sadism were each measured using six items, while Machiavellianism was measured with four items. An individual's mean score on each trait indicated their level of that Dark Tetrad trait. Example items include "I do not trust others at work" (i.e., Machiavellianism); "I have been told I act rashly at work" (i.e., psychopathy); and "I love to watch my boss yelling at my coworkers" (i.e., sadism). This measure has demonstrated strong validity and reliability in several studies (i.e., Barry, 2020;

Fernández-del-Río et al., 2020). The internal consistency reliability for each subscale is presented in Table 1.

Grandiose and vulnerable narcissism. The Super-short form of the Five-Factor Narcissism Inventory (FFNI-SSF; West et al., 2021) was used to measure grandiose and vulnerable narcissism. The FFNI-SSF has 15 items and uses a 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*). The FFNI-SSF measures the three higher order factors of narcissism, namely antagonism, agentic extraversion, and neuroticism. Examples of items include "I don't worry about others' needs" (i.e., antagonism); "I am comfortable taking on positions of authority" (i.e., agentic extraversion); and "I feel ashamed when people judge me" (i.e., neuroticism). Antagonism is considered the common core of the two narcissistic subtypes (Back & Morf, 2017; Krizan & Herlache, 2018). An individual's score on the agentic extraversion facet indicates their level of grandiose narcissism, while their score on the neuroticism factor indicates their level of vulnerable narcissism (West et al., 2021; Back & Morf, 2017; Krizan & Herlache, 2018). The FFNI-SSF was selected over more popular measures such as the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979), because the NPI only measures grandiose narcissism. Given my interest in differentiating between grandiose and vulnerable narcissism, and time constraints that limit the number of items I could present in a survey, the FFNI-SSF was a more practical choice. Additionally, the FFNI-SSF has demonstrated strong validity and reliability and is psychometrically comparable to its parent scales, the Five-Factor Narcissism Inventory (FFNI) and the Short form of the Five-Factor Narcissism Inventory (FFNI-SF) (West et al., 2021). The internal consistency reliability for each subscale is presented in Table 1.

Occupational stressors. I used Sansó et al. (2021)'s Brief Nursing Stress Scale (BNSS) to measure the presence of occupational stressors specific to the nursing occupation. The BNSS contains six items and uses a 4-point Likert-type scale (1 = *never, 4 = almost always*) which asks participants to indicate how frequently they suffer from a variety of stressors, such as "stressful situations derived from the process of dying or death" or "stressful situations derived from conflicts with doctors." A high score on the BNSS indicates a high presence of stressors at work, while a low score indicates a minimal presence of stressors at work. The scale was tested on a sample of Spanish end-of-life nurses, where it demonstrated strong validity and reliability (Sansó et al., 2021). The internal consistency reliability is presented in Table 1.

Perceived stress. Perceived stress was measured using Marcatto et al. (2021)'s 4-item Perceived Occupational Stress (POS) Scale. The POS scale uses a 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*). An example item is "At work I feel under pressure." The POS scale was validated on six samples of Italian workers and shown to demonstrate strong validity and reliability and is psychometrically comparable to its parent scales (Marcatto et al., 2021). The internal consistency reliability is presented in Table 1.

Emotion-focused coping. Emotion-focused coping was measured using items from the Brief COPE Scale (Carver, 1997). The Brief COPE Scale contains 28 items and uses a 4-point Likert-type scale (1 = *I haven't been doing this at all, 4 = I've been doing this a lot*) which asks participants to indicate how frequently they have engaged in a variety of coping behaviors. The coping strategies tested are self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. Given my focus on emotion-focused coping, I will only use items for self-distraction (items 1 and 19), denial (items 3 and 8), and

self-blame (items 13 and 26). Furthermore, item one ("I've been turning to work or other activities to take my mind off things"), which targets self-distraction, will be modified. I will remove "work or" because the source of stress that is being studied is work, so participants would not feasibly be distracting themselves from work with work. Example items include "I've been saying to myself "this isn't real" (denial) and "I've been criticizing myself" (self-blame). A high score on the Brief COPE Scale indicates higher levels of emotion-focused coping, while a low score indicates lower levels of emotion-focused coping. The scale has been tested on a variety of samples, including Malaysian women undergoing breast cancer treatment (Yusoff et al., 2010) and Chilean adults exposed to a variety of stressful experiences (García et al., 2018), and shown strong validity and reliability. The internal consistency reliability is presented in Table 1.

Depressive symptoms. Finally, I measured depressive symptoms in a nonclinical capacity using the Mental Health Inventory (MHI-3), which is a shortened version of the MHI-5 (Yamazaki et al., 2005). The MHI-3 contains 3 items and uses a 6-point Likert-type scale (1 = *all of the time*, *6 = none of the time*) which asks participants to indicate how often they have felt certain ways in the past month. For example, participants are asked "How much of the time during the last month have you felt downhearted and blue?". Possible scores on the MHI-3 range from a sum of 3 to 18 points, with a low score indicating depressive symptoms. The MHI-3 was validated on a large sample of Japanese adults and shown to demonstrate strong validity and reliability (Yamazaki et al., 2005). The internal consistency reliability is presented in Table 1.

Table 1
Internal Consistency of Subscales and Scales

Scale or Subscale	Friday	Monday	Overall
Machiavellianism	.850	-	
Psychopathy	.859	-	
Sadism	.915	-	
Antagonism	.836	-	
Agentic Extraversion	.682	-	
Neuroticism	.782	-	
BNSS	.796	.708	.850
Self-distract	.642	-	
Denial	.804	-	
Self-blame	.832	-	
POS	.876	.842	.914
Depression	.835	.805	.868

Procedure

The data for this study were collected as part of a larger project examining work stress and recovery in nurses. This project was conducted by graduate students in the Industrial-Organizational Psychology program at Middle Tennessee State University. Nurses in this study were recruited through Prolific and completed an online Qualtrics survey regarding work stress, personality, off-job thinking, recovery activities, coping strategies, engagement, exhaustion, and depression. The study purpose, description, conditions of participation, and compensation appeared on the Prolific dashboard of eligible participants. Participants were informed of the voluntary nature of their participation and the anonymity of their responses and provided informed consent at the beginning of each survey. After completing the Day 1 survey, participants were reminded of an opportunity to complete the Day 2 survey on the following Monday. Only participants who completed the Day 1 survey were eligible to complete the Day 2 survey. For quality assurance purposes, each survey included three attention check items that were distributed throughout the survey. If a participant failed two or more attention checks, their

submission was rejected, and they were not compensated for their participation. Furthermore, they were not recruited for the Day 2 survey, and their data was not used in analyses.

On Day 1, participants completed the following instruments (in this order) for my portion of the larger study: DTW, FFNI-SSF, BNSS, POS, MHI-3. On Day 2, participants completed the following instruments (in this order) for my portion of the larger study: BNSS, POS, Brief COPE, MHI-3. At the end of each survey, participants were directed to a debriefing statement thanking them for their participation and providing contact information in case they had any questions. The survey content and timing are displayed in Table 2. Additionally, the Institutional Review Board (IRB) approval letter for both this study and Study 2 can be found in Appendix H.

Table 2
Survey Content & Timing

Scale	Day 1 (Friday)	Day 2 (Monday)
DTW	X	
FFNI-SSF	X	
BNSS	X	X
POS	X	X
Brief COPE		X
MHI-3	X	X

Results

Descriptive Results

Descriptive statistics and correlations among variables within and across days were calculated and are displayed in Table 3. Overall, the means for reported stressors, perceived stress, emotion-focused coping, and depression were quite low, with all means but perceived stress being below 3 on a 5-point scale. The overall sample therefore experienced relatively low stress. Additionally, the means for the Dark Tetrad personalities were also quite low, with all

means being below 3 on a 5-point scale. This is to be expected given the positively skewed distribution of such personalities in the general population and in nurses (Bucknall et al., 2015).

Most correlations were significant. Interestingly, when looking at the correlations between stressors and personality, stressors were most strongly correlated with Machiavellianism and psychopathy, moderately correlated with sadism and vulnerable narcissism, and not significantly correlated with grandiose narcissism. Similarly, perceived stress was correlated with Machiavellianism and vulnerable narcissism, but not with psychopathy, sadism, or grandiose narcissism. Emotion-focused coping and depression, on the other hand, were significantly correlated with all Dark Tetrad personalities and all other variables.

Table 3

Overall Means, Standard Deviations, and Intercorrelations

Variable	Mean	***SD***	1	2	3	4	5	6	7	8
1. Stressors	2.63	.55	-							
2. Perceived Stress	3.32	.91	.452*	-						
3. Emotion Coping	2.02	.54	.287*	.204*	-					
4. Depression	2.41	1.07	.282*	.291*	.414*	-				
5. Machiavellianism	2.77	.96	.355*	.287*	.264*	.305*	-			
6. Psychopathy	1.57	.62	.220*	.102	.219*	.322*	.285*	-		
7. Sadism	1.40	.61	.187*	.032	.259*	.241*	.261*	.810*	-	
8. Grandiose Narcissism	2.27	.62	.094	-.002	.213*	.269*	.320*	.460*	.519*	-
9. Vulnerable Narcissism	2.13	.58	.144*	.165*	.359*	.416*	.415*	.492*	.565*	.719*

Note. Relationships displayed are collapsed across two days. * $p < .05$.

A few correlations are relevant to the hypotheses and merit further discussion. Specifically, when looking at the mediation pathway, stressors and perceived stress were significantly correlated, perceived stress and emotion-focused coping were significantly correlated, emotion-focused coping and depression were significantly correlated, and stressors and depression were significantly correlated. The significant correlations between all four components of the mediation pathway suggest that there may be support for Hypothesis 1.

The correlations also suggest some support for Hypotheses 2-6, which predict moderating effects of the Dark Tetrad personalities on the relationship between stressors and perceived stress. Perceived stress was significantly correlated with Machiavellianism and vulnerable narcissism, but not with psychopathy, sadism, or grandiose narcissism.

Test of Hypotheses

Hypotheses 1, 2, 3, 4, 5, and 6 were tested in Jamovi utilizing the medmod module (Selker, 2017). A serial mediation model was created in the following manner. Day 1 stressors influenced Day 1 perceived stress, which influenced Day 2 emotion-focused coping, which influenced Day 2 depression. Day 1 measures the Dark Tetrad personalities moderated the relationship between Day 1 stressors and Day 1 perceived stress. To reduce the effects of multicollinearity, stressors, Machiavellianism, psychopathy, sadism, grandiose narcissism, and vulnerable narcissism were centered. The overall model statistics were $R^2 = 0.384$, $F = 4.99$, $p<.001$.

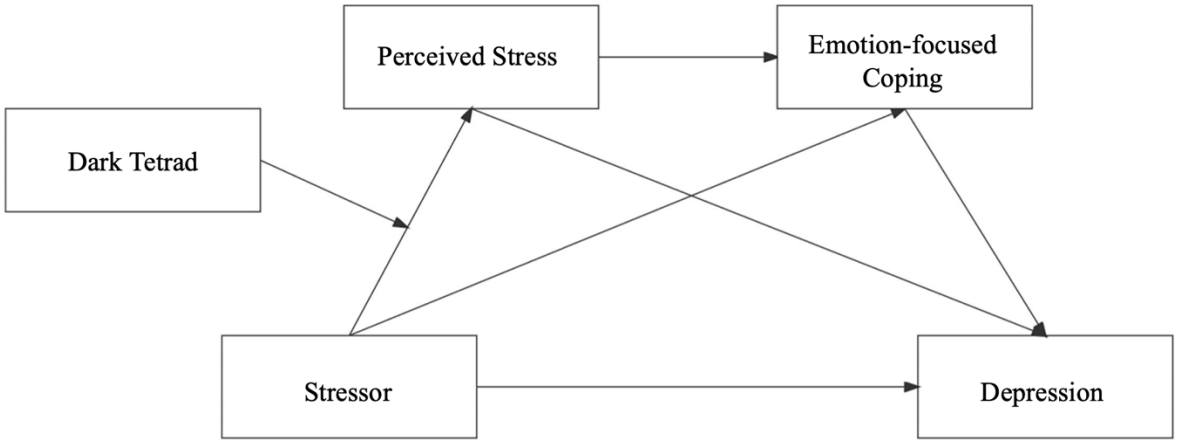
Hypothesis 1 stated that stressors will have an indirect effect via serial mediation on depression (strain) through perceived stress and emotion-focused coping. The serial mediation was not found to be statistically significant in the full model, *estimate* = .02, $z = 0.59$, $p = .554$. Thus, Hypothesis 1 was not supported.

Hypothesis 2 stated that grandiose narcissism moderates the serial mediation between stressors and depression through stress appraisal (perceived stress) and emotion-focused coping, such that those high in grandiose narcissism will be less likely to appraise stressors as stressful. This relationship was not found to be statistically significant, *estimate* = .007, $z = 0.50$, $p = .616$, so Hypothesis 2 was not supported. Hypothesis 3 stated that vulnerable narcissism moderates the serial mediation between stressors and depression through stress appraisal (perceived stress) and emotion-focused coping, such that those high in vulnerable narcissism will be more likely to appraise stressors as stressful. This relationship was not found to be statistically significant, *estimate* = -.01, $z = -0.56$, $p = .575$, so Hypothesis 3 was not supported.

Hypothesis 4 stated that psychopathy moderates the serial mediation between stressors and depression through stress appraisal (perceived stress) and emotion-focused coping, such that those high in psychopathy will be more likely to appraise stressors as stressful. This relationship was not found to be statistically significant, *estimate* = -.005, $z = -0.48$, $p = .633$, so Hypothesis 4 was not supported. Hypothesis 5 stated that Machiavellianism moderates the serial mediation between stressors and depression through stress appraisal (perceived stress) and emotion-focused coping, such that those high in Machiavellianism will be more likely to appraise stressors as stressful. This relationship was not found to be statistically significant, *estimate* = -.002, $z = -0.38$, $p = .702$, so Hypothesis 5 was not supported. Lastly, Hypothesis 6 stated that sadism moderates the serial mediation between stressors and depression through stress appraisal (perceived stress) and emotion-focused coping, such that those high in sadism will be more likely to appraise stressors as stressful. This relationship was not found to be statistically significant, *estimate* = -.002, $z = -0.23$, $p = .819$, so Hypothesis 6 was not supported.

Figure 1

Hypothesized Moderated Serial Mediation



Exploratory Analyses

Two additional exploratory analyses were conducted to further understand our data. None of the Dark Tetrad moderations were supported, so we tested the mediation model again without the moderators. In this case, the serial mediation was statistically significant, *estimate* = .22, z = 2.78, p = .005, providing support for Hypothesis 1.

An additional exploratory analysis was conducted to determine whether measuring stressors, perceived stress, emotion-focused coping, and depression all on the same day influences the results. To this end, an additional serial mediation model was tested using Day 1 measures of the Dark Tetrad personalities and Day 2 measures of stressors, perceived stress, emotion-focused coping, and depression. However, all tested relationships remained non-significant in this additional model.

Discussion

This study sought to test an overall mediation pathway in which stressors influence perceived stress, which influences emotion-focused coping, which influences depression. Support was found for this mediation pathway when the Dark Tetrad was *not* included in the

model, suggesting that the presence of occupational stressors in the nursing environment does increase a nurse's perceived stress. An increase in perceived stress then contributes to an increase in the use of emotion-focused coping strategies, namely denial, self-distraction, and self-blame. These emotion-focused coping strategies might be self-soothing in the short term but are ultimately detrimental in the long term, leading to strain in the form of depression.

Additionally, the study tested the moderating effects of the Dark Tetrad personalities on the relationship between stressors and perceived stress, such that the Dark Tetrad personalities influence a person's appraisal of a stressor. However, no support was found for any moderating effects, suggesting that the Dark Tetrad personalities do not significantly influence the relationship between stressors and a person's appraisal occupational stressors in nurses.

These findings provide important insight into the research questions at hand. However, a significant limitation of this study is that the data were gathered from only two timepoints (across one weekend), limiting our ability to effectively test for the influence of the mediation pathway on depression, as depression is an outcome that develops over a longer period of time. To overcome this limitation, we chose to conduct a second study, testing the same hypotheses with a new sample of nurses over six timepoints rather than two timepoints.

Study 2

The purpose of Study 2 was to test a moderated serial mediation in which stressors lead to perceived stress which leads to emotion-focused coping and depression. The Dark Tetrad personalities were tested as moderators in the relationship between stressors and perceived stress. Study 2 therefore tested the same hypotheses as Study 1 but intended to overcome some of its limitations. Namely, Study 2 employed six timepoints rather than two timepoints to better assess changes in the long-term outcome of depression. It also used a different sample of nurses recruited through a local hospital.

Methods

Participants

As with Study 1, the target population for this study was nurses. Participants were recruited through a mass email sent to a list of ambulatory nurses working in the Oncology department at Vanderbilt University Medical Center. The survey was administered six times over the course of five weeks, spanning weekends like in Study 1. The study was administered on weekends 1, 3, and 5, while weekends 2 and 4 were the off weeks. During the first week, nurses were sent the survey on Friday afternoon and again on Monday morning. Because the population from which these nurses were recruited primarily worked in outpatient settings, most of the nurses should not have work scheduled on the weekend. This sequence of administration was repeated two weeks later and four weeks later, for a total of six administrations. The number of participants completing the survey at each time point, in sequential order, was as follows: 19, 24, 17, 21, 14, 14. Usable data was obtained from 14 participants who completed all six administrations. The multilevel model analysis required participants to have completed the Day 1 survey (to obtain responses to the Dark Tetrad scale) and at least one consecutive set of Friday to

Monday surveys. This sample size of 14 did not reach the minimum sample size of 162 required for a power of .80 or higher. Thus, any conclusions from the analyses should be interpreted with this in mind.

The average age of participants was 41 (*SD* = 11.9), and the majority (94.7%) were female. The sample was 89.5% White, 5.3% Native Hawaiian/Pacific Islander, and 5.3% multiracial. All participants resided in the U.S. The majority (63.2%) of participants did not report having children. Participants reported working an average of 40.4 hours per week (*SD* = 3.58). All held an RN license, and all but two nurses reported working at Vanderbilt University Medical Center.

Participants provided consent via an online consent form before completing each survey and were informed that all their data would remain anonymous. Nurses in this study were asked to create a unique identifier to link their data across administrations for analysis and allocating compensation. They were instructed to use an identifier that they could remember easily (e.g., a combination of their phone number and letters of their name, such as most1418). However, no identifiable participant information was collected.

Participants were compensated for their participation via a drawing for electronic gift cards. At each time point, participants who completed the survey could choose to enter into a drawing for one of two $25 electronic gift cards and earned one entry into a bigger drawing for one of three $50 electronic gift cards. Participants who completed all six time points received six bonus entries into this drawing, for a total of 12 entries in the larger drawing. All drawings took place at the end of data collection (after the last timepoint) and gift cards were then distributed to the recipients.

Email addresses were collected for the sake of distributing gift cards. After completing each survey, participants who wanted to enter into the gift card drawing were redirected to a separate survey which asked for their email address. Email addresses were therefore only collected for the sake of distributing gift cards and were always kept separate from participants' responses to the research study in order to maintain anonymity.

Materials

The materials used in Study 2 were identical to those used in Study 1. The internal consistency reliability for all scales and subscales is presented in Table 4.

Table 4
Internal Consistency of Subscales and Scales

	T1	T2	T3	T4	T5	T6	Overall
Machiavellianism	.848	-	-	-	-	-	.848
Psychopathy	.615	-	-	-	-	-	.615
Sadism	.872	-	-	-	-	-	.872
Antagonism	.601	-	-	-	-	-	.601
Agentic Extraversion	.623	-	-	-	-	-	.623
Neuroticism	.819	-	-	-	-	-	.819
BNSS	.600	.325	.550	.635	.778	.659	.844
Self-distract	-	.737	-	.734	-	.843	.690
Denial	-	.791	-	.866	-	.933	.921
Self-blame	-	.582	-	.788	-	.481	.819
POS	.911	.901	.788	.904	.951	.940	.931
Depression	.877	.611	.607	.805	.961	.848	.917

Procedure

Data for this study was collected as part of a larger project examining work stress and recovery in nurses. This project was conducted by graduate students in the Industrial-Organizational Psychology program at Middle Tennessee State University. Ambulatory nurses were recruited through the Oncology department of Vanderbilt University Medical Center. Nurses in this study received an online Qualtrics survey regarding work stress, personality, off-

job thinking, coping strategies, engagement, exhaustion, and engagement. Participants were informed of the voluntary nature of their participation and the anonymity of their responses. They provided informed consent at the beginning of each survey. Nurses were emailed a survey link on Friday afternoon (available from 1pm to 11:59pm CST) and a second survey on the morning of their first day back at work (available from 5am to 2pm CST). This sequence of administration was repeated two weeks later, and again four weeks after the initial administration, for a total of six time points (three afternoons, three mornings).

At time point 1, participants completed the following instruments (in this order) for my study: DTW, FFNI-SSF, BNSS, POS, MHI-3. At time points 2, 4, and 6, participants completed the following instruments (in this order) for my study: BNSS, POS, Brief COPE, and MHI-3. At time points 3 and 5, participants completed the following instruments (in this order) for my study: BNSS, POS, MHI-3. At the end of each survey, participants were directed to a debriefing statement thanking them for their participation and providing contact information in case they had any questions.

Table 5
Survey Content & Timing

Scale	Week 1		Week 2		Week 3	
	Friday	Monday	Friday	Monday	Friday	Monday
DTW	X					
FFNI-SSF	X					
BNSS	X	X	X	X	X	X
POS	X	X	X	X	X	X
Brief COPE		X		X		X
MHI-3	X	X	X	X	X	X

Results

Descriptive Results

Descriptive statistics and correlations among variables within and across days were calculated and are displayed in Table 6. Overall, the means for reported stressors, perceived stress, emotion-focused coping, and depression were quite low, with all means but perceived stress being below 3 on a 5-point scale. Additionally, the means for the Dark Tetrad personalities were also low, with all means but Machiavellianism being below 2 on a 5-point scale. Thus, as in Study 1, the sample in Study 2 experienced relatively low stress and was low on the Dark Tetrad traits.

A few correlations are relevant to the hypotheses and merit further discussion. Specifically, when looking at the mediation pathway, stressors and perceived stress were significantly correlated, perceived stress and emotion-focused coping were not significantly correlated, emotion-focused coping and depression were not significantly correlated, and stressors and depression were not significantly correlated. The lack of significance in three out of four of these mediation paths suggests there is little support for Hypothesis 1.

However, the correlations suggest potential support for Hypotheses 2-6, which predicted moderating effects of the Dark Tetrad personalities on the relationship between stressors and perceived stress. Perceived stress was significantly correlated with Machiavellianism, psychopathy, and sadism, but not grandiose narcissism or vulnerable narcissism.

Table 6

Overall Means, Standard Deviations, and Intercorrelations

Variable	Mean	***SD***	1	2	3	4	5	6	7	8
1. Stressors	2.60	.445	-							
2. Perceived Stress	3.42	.955	.478*	-						
3. Emotion Coping	1.79	.435	.271*	.168	-					
4. Depression	2.07	.733	.188	.418*	-.237	-				
5. Machiavellianism	2.43	.850	.448*	.651*	.326	.685*	-			
6. Psychopathy	1.26	.323	.085	.299*	.105	.400*	.491*	-		
7. Sadism	1.29	.485	.264*	.341*	.389*	.436*	.481*	.809*	-	
8. Grandiose Narcissism	1.82	.262	.089	.102	.126	.229	.507*	.451*	.245*	-
9. Vulnerable Narcissism	1.87	.300	.153	.145	.107	.229	.316*	.526*	.391*	.387*

Note. Relationships displayed are collapsed across six days. * $p < .05$.

Test of Hypotheses

To test all hypotheses in Study 2, we built a multilevel model using the lavaan package in R (Rosseel, 2012). First, data from all six days was stacked across participants in SPSS. Then we wrote and ran an R script to test the multilevel model. The Dark Tetrad variables (grandiose narcissism, vulnerable narcissism, Machiavellianism, psychopathy, sadism) were set as fixed effects (Level 2). Stressors, perceived stress, emotion-focused coping, and depression were set as random effects (Level 1). However, the number of model parameters (51) far exceeded the number of individuals who completed all six days of the survey ($N = 14$), so we were unable to test the model. Instead, we opted for a series of exploratory analyses to test parts of the model individually rather than the overall model. The R script for both the hypothesized model and the exploratory analyses is provided in the appendix.

Exploratory Analyses

The first exploratory analysis tested Hypothesis 1, which stated that stressors would have an indirect effect via serial mediation on depression (strain) through perceived stress and emotion-focused coping. This was done by running 1-1-1 random effects only repeated measures regression using the lavaan package in R (Rosseel, 2012). Depression was used as the outcome, while stressors, perceived stress, and coping were used as predictors. The number of model parameters dropped down to 13 and the number of identified clusters rose to $n = 36$. Thus, the model converged. Estimates for each path are shown in Table 7. The indirect effect of perceived stress on depression was not found to be significant ($b = -.05$, $SE = .04$, $z = -1.07$, $p = .286$). Additionally, the total effect of the pathway was not found to be significant ($b = -.31$, $SE = .35$, $z = -0.89$, $p = .373$). Therefore, Hypothesis 1 was not supported.

Table 7
Estimates for Mediation Pathway

	Estimate (*b*)	*SE*	*z*	*p*
Depression				
Coping	-.41	.26	-1.58	.114
Perceived Stress	.26	.11	2.35	.018*
Stressors	-.11	.27	-.41	.681
Coping				
Perceived Stress	.09	.08	1.20	.229
Perceived Stress				
Stressors	1.21	.33	3.64	.0003*

The second exploratory analysis (usable sample size = 19) reintroduced the Dark Tetrad personalities as moderators but removed depression and emotion-focused coping from the overall model. This allowed us to test the interactions between the Dark Tetrad personalities and stressors to influence perceived stress only. This moderated mediation was tested in Jamovi with the GAMLj module using a linear mixed model (Gallucci, 2023). Parameter estimates for each of the five interactions are shown in Table 8.

Table 8
Parameter Estimates for Interactions between DT and Stressors

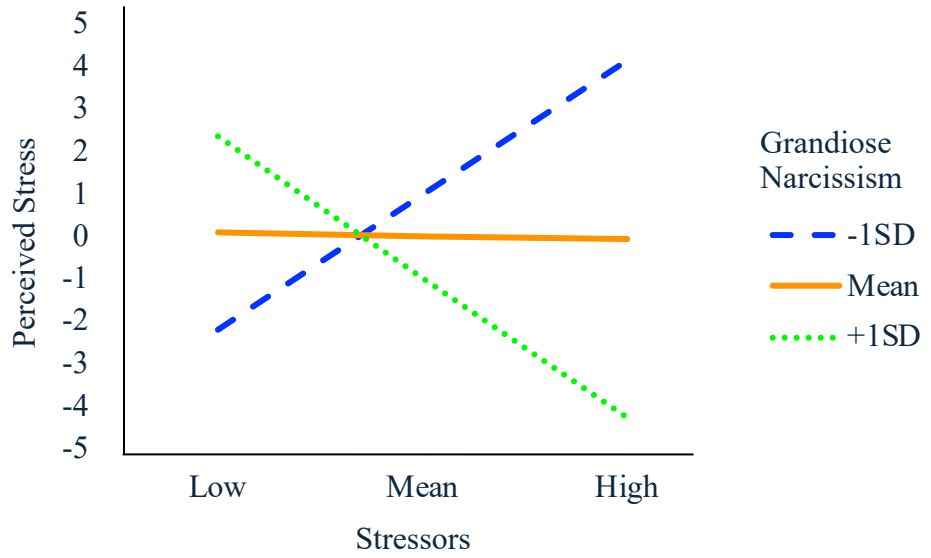
	Estimate	t-value	p
GN x Stressors	-31.41	-3.06	.012*
VN x Stressors	6.98	.93	.385
Mach x Stressors	6.24	2.13	.062
Psycho x Stressors	-27.33	-2.04	.067
Sadism x Stressors	17.26	2.08	.065

The interaction between grandiose narcissism and stressors was found to be significant (b = -31.41, SE = 10.26, p = .012, F = 9.38, marginal R^2 = 0.351, conditional R^2 = 0.781). The simple effects of stressors on perceived stress at varying levels of grandiose narcissism are as follows: at 1 *SD* below the mean of grandiose narcissism, b = 5.58 and p = .124, at the mean of grandiose narcissism, b = -2.38 and p = .324, and at 1 SD above the mean of grandiose

narcissism, b = -10.35 and p = .015. The moderation plot is displayed in Figure 2. This interaction suggests that for those high in grandiose narcissism, the relationship between stressors and perceived stress is negative. However, for those low in grandiose narcissism, the relationship between stressors and perceived stress is positive. While this was not a direct test of hypothesis 2, this does indicate that the relationship between stressors and perceived stress depends on one's level of grandiose narcissism. Because the sample size was too small, we were not able to directly test hypothesis 2. Based on this interaction and the exploratory serial mediation, I suspect that with a sample size large enough to test the full model, the hypothesis would be supported. None of the remaining interactions between stressors and vulnerable narcissism, Machiavellianism, psychopathy, and sadism were significant. Therefore, no support was found for Hypotheses 3, 4, 5, or 6.

Figure 2

Grandiose Narcissism Moderation of Stressors to Perceived Stress



Discussion

This study built upon the findings of Study 1, testing the same hypotheses with six timepoints rather than two timepoints to more effectively examine changes in the long-term outcome of depression. Specifically, Study 2 tested an overall mediation pathway in which stressors influence perceived stress, which influences emotion-focused coping, which influences depression (Hypothesis 1). Although this mediation pathway was supported in Study 1, it was not supported in Study 2. Given the support found for this pathway in Study 1 and in the stress literature, the lack of a significant finding in Study 2 may be an artifact of the study's small sample size (n = 36).

Study 2 also tested the same moderating effects of the Dark Tetrad personalities on the relationship between stressors and perceived stress that were tested in Study 1. Like in Study 1, no significant moderating effect was found for Machiavellianism, psychopathy, sadism, or vulnerable narcissism. However, a significant effect was found for grandiose narcissism, where those high in grandiose narcissism were less likely to appraise stressors as stressful. This is likely due to the high self-esteem associated with grandiose narcissism (Ng et al., 2014). High self-esteem has been found to be a protective factor against perceived stress and its detrimental short- and long-term effects because it increases an individual's confidence in their ability to handle the stressors they face (Ng et al., 2014; Papageorgiou, 2019).

General Discussion

These two studies tested several hypotheses regarding the stress process as well as the influence of the Dark Tetrad personalities on this process among nurses. The first hypothesis predicted that stressors would have an indirect effect via serial mediation on depression through perceived stress and emotion-focused coping. This hypothesis was supported in Study 1, as all four components of the mediation pathway were significantly correlated in the correlation matrix, and the serial mediation analysis in Jamovi yielded significant results. However, it was not supported in Study 2, where neither the correlation matrix nor the serial mediation analysis showed significant effects. While the small sample size of Study 2 (n = 36) may have contributed to the null findings by limiting statistical power, the differences in effect sizes between the two studies suggest that sample size alone may not fully explain the discrepancy. Study 1's support for the mediation pathway aligns with prior research, which has found that stressors increase perceived stress (e.g., Lee et al., 2013), perceived stress is linked to greater use of emotion-focused coping strategies (e.g., Lee et al., 2013), and emotion-focused coping strategies (e.g., denial, self-distraction, self-blame) are associated with higher depression risk over time (e.g., Cheng et al., 2024). While Study 2 did not replicate this pattern, the stronger effect size observed in Study 1 suggest that the proposed mediation pathway may be robust under certain conditions. This study contributes to the existing literature by not only supporting the individual relationships within the mediation model but also testing the full serial mediation pathway, offering a more comprehensive understanding of how stressors contribute to depression. Our findings therefore both support the existing literature and expand upon it by testing the full serial mediation pathway rather than its individual components.

The two studies also tested whether the Dark Tetrad personalities act as moderators in the relationship between stressors and perceived stress, thereby influencing a person's appraisal of stress. The rationale for these predictions stemmed from findings in the literature linking the Dark Tetrad personalities to certain stress responses. Grandiose narcissism has been linked to decreased perceived stress, likely due to the high self-efficacy seen in grandiose narcissists (Kajonius & Björkman, 2018; Ng et al., 2014; Papageorgiou, 2019). It was therefore argued that those high in grandiose narcissism would experience decreased perceived stress in response to stressors. This hypothesis was not supported in Study 1 but was supported in the exploratory analyses in Study 2. Our results seem to align with the findings of other studies regarding the decreased perceived stress seen in those high in grandiose narcissism.

Vulnerable narcissism has been linked to increased perceived stress, likely due to the low self-esteem and anxious tendencies of vulnerable narcissists (Kajonius & Björkman, 2018; Ng et al., 2014; Papageorgiou, 2019). It was therefore argued that those high in vulnerable narcissism would experience increased perceived stress in response to stressors. However, this hypothesis was not supported in either study, suggesting that vulnerable narcissism has no significant influence on the stress appraisal process among nurses.

Psychopathy has been linked to increased perceived stress (Diedenhofen & Musch, 2015; (Wendt & Bartoli, 2019). This may be explained by the low tolerance for frustration seen in psychopathy; stressors are seen as more threatening to goal progress (frustrating), leading to increased perceived stress (Bettencourt et al., 2006; Blair, 2010). It was therefore argued that those high in psychopathy would experience increased perceived stress in response to stressors. This hypothesis was not supported in either study, suggesting that psychopathy has no significant influence on the stress appraisal process among nurses.

Machiavellianism has been linked to increased perceived stress, potentially due to the lack of positive affect and empathy seen in Machiavellianism, which are considered protective factors against perceived stress (Diedenhofen & Musch, 2015; Wendt & Bartoli, 2019; Egan et al., 2014; Kopala-Sibley et al., 2016). It was therefore argued that those high in Machiavellianism would experience increased perceived stress in response to stressors. However, this hypothesis was not supported by either study, suggesting that Machiavellianism has no significant influence on the stress appraisal process among nurses.

Finally, while the evidence on sadism and stress appraisal is sparse, some studies have linked sadism to increased negative affect and poor wellbeing, which is associated with perceived stress (Dinić et al., 2019; Womick et al., 2018; Yu et al., 2007). It was therefore argued that those high in sadism would experience increased perceived stress in response to stressors. However, this hypothesis was not supported in either study, suggesting that sadism has no significant influence on the stress appraisal process among nurses.

Given the sparse and conflicting findings in the literature regarding the influence of the Dark Tetrad personalities on perceived stress, our results can be interpreted in multiple ways. Our finding regarding grandiose narcissism aligns with studies linking narcissism to a longer life expectancy and more positive health outcomes as compared to the rest of the Dark Tetrad (Jonason et al., 2015). This difference in health outcomes might be explained by a more positive stress appraisal in grandiose narcissists (Birkás et al., 2016), as seen in our study. The lack of a significant influence of vulnerable narcissism, Machiavellianism, psychopathy, and sadism on perceived stress in our study could be explained by shared variance among the variables (as evidenced by most of the correlations between personality traits and variables in the mediation model being significant). It could also be explained by conflicting findings in the literature. For

instance, narcissism has been linked to greater perceived reactivity to threats in some studies (Hopwood et al., 2011; Campbell et al., 2010), but reduced reactivity (Birkas et al., 2016; Onley et al., 2013) and even no effect (Noser et al., 2014) in others. Similarly, Machiavellianism has been linked to increased perceived stress (e.g., Wendt & Bartoli, 2019), but other studies have found no relationship between Machiavellianism and perceived stress (Kajonius & Björkman, 2018; Noser et al., 2014). Psychopathy has been linked to both increased perceived stress (Diedenhofen & Musch, 2015) and decreased perceived stress (Kajonius & Björkman, 2018). Sadism has very sparse findings but has been associated with greater psychological distress, which might lend itself to greater perceived stress (Dinić et al., 2019). Therefore, our results contribute to the literature by suggesting that the Dark Tetrad personalities, with the exception of grandiose narcissism, do not have a significant positive or negative influence on the stress appraisal process in nurses. It may be that the DT personalities influence the stress appraisal process in both positive and negative ways, which cancel each other out and create a net nonsignificant finding, or it may be that the DT personalities have no influence on stress appraisal in nurses.

The results of the two studies lead to theoretical implications in terms of the Griffin & Clarke (2011) integrated stress model. The model argues that stress is a dynamic process in which the person (personality, skills, etc.) and environment (stressors) interact to influence short-term dynamics (stress appraisal, stress response, and goal processes), which then influence long-term stress health and performance outcomes (Griffin & Clarke, 2011). The serial mediation pathway between stressors, perceived stress, emotion-focused coping (response), and depression (long-term stress outcome) was supported in Study 1, reinforcing the theoretical argument of the Griffin & Clarke (2011) model. Additionally, while no evidence was found for an influence of

vulnerable narcissism, Machiavellianism, psychopathy, and sadism on stress appraisal, evidence was found for an influence of grandiose narcissism on stress appraisal. This finding supports the argument that there is an interaction between person and environment (stressors) that influences appraisal processes, goal processes, and response processes in the Griffin & Clarke (2011) model.

Practical Implications

The results of the two studies lead to several practical implications. The first is that depression is in fact a long-term outcome of experiencing occupational stress in nursing. Depression is not only significantly detrimental to the wellbeing of individual nurses but is also costly to the organization in the form of absenteeism, decreased performance, and increased healthcare costs. Hospitals and other medical centers should therefore have a vested interest in decreasing the work stressors that lead to depression in their nurses. The findings of these studies suggest that there are several ways to do this. While some stressors such as exposure to death and illness are inherent to the occupation and therefore almost impossible to decrease, interpersonal stressors, such as conflict with doctors, can be decreased by changing the organizational culture or climate to increase harmony and collaboration.

Another way to decrease the risk of depression among nurses is by encouraging them to avoid emotion-focused coping strategies, as these are detrimental to wellbeing in the long-run (Cheng et al., 2024). Instead, nurses should be given training on using more effective coping strategies such as problem-focused coping (tackling the stressor directly), meaning-focused coping (finding purpose in the stressor by reframing it in a positive way), or social support.

The findings of these studies also suggest that healthcare organizations can decrease the risk of depression among nurses by decreasing their perceived stress. Interventions aimed at

influencing the stress appraisal process could be implemented to increase nurses' belief in their ability to handle the stressor, thereby decreasing perceived stress. Additionally, healthcare organizations could provide their nurses with resources that allow them to better handle the stressors, such as Employee Assistance Programs (EAPs) to promote psychological wellbeing and increased time off to engage in recovery activities. Not only would nurses benefit from these resources by being able to use them when their perceived stress is high, but knowledge of resource availability may increase nurses' perceived resource pool. According to the job demands-resources theory, this perception may then lend itself to greater confidence in nurses' ability to overcome the demands of the stressor, positively influencing stress appraisal (Bakker & Demerouti, 2007).

Strengths, Limitations, and Future Directions

The two studies have several strengths and weaknesses. Both studies use a repeated measures design (two timepoints for Study 1, six timepoints for Study 2). This design increases the strength of causal inferences, lending greater credibility to the causal relationships tested between stressors, perceived stress, emotion-focused coping, and depression. Another strength of the two studies is that they sampled nurses only. This creates a more homogeneous sample, which decreases the random effects present in other samples and thereby might decrease the risk of confounding variables influencing results (Bornstein et al., 2013). Additionally, the nursing occupation is not only exceptionally stressful but also presents unique work stressors such as dealing with death and dying patients. Thus, by sampling nurses only, we could make stronger recommendations for practitioners and researchers regarding understanding and managing occupational stress.

However, these two studies also have several weaknesses which indicate potential avenues for future research. The most notable weakness of both studies is sample size. Study 1 had a sample size of 163, which is just barely above the sample size of 162 needed to reach a power of .80 or higher. In Study 2, the original population was 173 Vanderbilt Oncology nurses, but the resulting sample size was 36, which is extremely small and runs the risk of not detecting significant relationships. This may be why the serial mediation pathway which was supported in Study 1 and much of the stress literature but was not found to be significant in Study 2. The study's small sample size also prevented us from successfully running a multilevel mediation analysis because the number of parameters exceeded the sample size. Future research should therefore test the same effects but with a significantly larger sample size to come to stronger conclusions regarding the Dark Tetrad's influence on the stress process.

Another weakness of the two studies is that they did not measure emotion-focused coping at all timepoints. This choice was made for two reasons: to keep the survey short and thereby increase participation, and to fall in line with the hypothesized causal order of the serial mediation. However, it limited the amount of data we had available to examine emotion-focused coping. Future studies should therefore measure emotion-focused coping at all timepoints in the study to allow for greater flexibility in analyses and more robust findings.

While the repeated measures design of the two studies did lend itself well to causal inferences, the timeframe of the studies was relatively short (one weekend for Study 1, five weeks for Study 2). The outcome of interest for both studies was depression, which develops and manifests over a longer time frame (e.g., months or years of repeated stressor exposure). Future research should therefore use a longer time frame to better capture changes in depression. Additionally, nurses were chosen as the population of interest in these studies due to the high

levels of stress and burnout in the nursing occupation (Nursing World, 2024). While this is not necessarily a limitation of the study, future research should explore the stress process and the influence of the Dark Tetrad on perceived stress in other working populations to determine if the findings of these studies generalize to other populations.

Conclusion

The purpose of these two studies was to examine how stressors contribute to depression through perceived stress and emotion-focused coping in nurses. They also explored whether the Dark Tetrad personality traits influence stress appraisal in nurses. Study 1 supported the proposed serial mediation model, but Study 2 did not, likely due to its small sample size. Across both studies, grandiose narcissism was the only Dark Tetrad trait to show an effect, reducing perceived stress in response to stressors. These findings contribute to the understanding of workplace stress in nursing by reinforcing the importance of stress appraisal and coping strategies in risk of depression. They also suggest that traits like grandiose narcissism—often viewed negatively in organizations—may have protective effects against stress. For healthcare organizations, these findings highlight the need to reduce workplace stressors, implement coping interventions, and provide resources that support nurses' mental health.

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APPENDICES

Appendix A

Dark Tetrad at Work Scale (DTW; Thibault & Kelloway, 2020)

Please rate your agreement or disagreement with each item:

Machiavellianism

1. I do not trust others at work.
2. At work, you always have to look out for yourself.
3. At work, people backstab each other to get ahead.
4. At work, people are only motivated by personal gain.

Psychopathy

1. I don't care if my work behavior hurts others.
2. I have been told I act rashly at work.
3. When I'm at work, I don't tend to think about the consequences of my actions.
4. I like to mooch off my coworkers.
5. I'm rather insensitive at work.
6. I don't care if I accidentally hurt someone at work.

Sadism

1. I love to watch my boss yelling at my coworkers.
2. I can dominate others at work using fear.
3. It's funny to watch people make mistakes at work.
4. I never get tired of mocking my coworkers.
5. I would laugh if I saw someone get fired.
6. I have daydreams about hurting people I work with.

Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree

Appendix B

Super-short form of the Five-Factor Narcissism Inventory (FFNI-SSF; West et al., 2021)

Please rate your agreement with each of the following items. There are no right or wrong answers. Describe yourself honestly and state your opinions as accurately as possible

Antagonism

1. When someone does something nice for me, I wonder what they want from me.
2. I don't worry about others' needs.
3. I'm pretty good at manipulating people.
4. I hate being criticized so much that I can't control my temper when it happens.
5. I will try almost anything to get my "thrills".
6. I do not waste my time hanging out with people who are beneath me.
7. It may seem unfair, but I deserve extra (i.e., attention, privileges, rewards).
8. I'm willing to exploit others to further my own goals.

Agentic extraversion

1. I am comfortable taking on positions of authority.
2. I often fantasize about having lots of success and power.
3. I aspire for greatness.
4. I love to entertain people.

Neuroticism

1. When people judge me, I just don't care.*
2. I feel ashamed when people judge me.
3. I wish I didn't care so much about what others think of me.

*Reverse-coded

Scale: 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*)

Appendix C

Brief Nursing Stress Scale (BNSS; Sansó et al., 2021)

Please indicate how frequently you encounter...

1. Situations involving the process of dying or death of patients
2. Situations involving conflicts with doctors
3. Situations involving lack of support
4. Situations involving conflict between nurses
5. Situations involving high workload
6. Situations involving the uncertainty of the treatment

Scale: 4-point Likert-type scale (1 = *never, 4 = almost always*)

Appendix D

Perceived Occupational Stress Scale (POS; Marcatto et al., 2021)

Thinking about your work over the past week, please indicate your agreement with the following statements:

1. My work is stressful.
2. Thinking about my work makes me feel tense.
3. At work I feel under pressure.
4. My work has negative effects on my health.

Scale: 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*)

Appendix E

Brief COPE Scale (Carver, 1997)

This questionnaire asks you to indicate what you generally do and feel when you experience stressful work events. Obviously, different events bring out somewhat different responses but think about what you usually do when you are under a lot of stress at work.

Using this scale, respond to the following:
1 = Not at all
2 = Little bit
3 = Medium amount
4 = Doing a lot

1. I've been turning to other activities to take my mind off things.
2. I've been saying to myself "this isn't real."
3. I've been refusing to believe that it has happened.
4. I've been criticizing myself.
5. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
6. I've been blaming myself for things that happened.

Appendix F

Mental Health Inventory (MHI-3; Yamazaki et al., 2005)

Over the past week or weekend, how often have you...

1. felt downhearted and blue?
2. felt so down in the dumps that nothing could cheer you up?
3. been a happy person?*

*Reverse-coded

Scale: all of the time (1 point), most of the time (2 points), a good bit of the time (3 points), some of the time (4 points), a little of the time (5 points), or none of the time (6 points).

Appendix G

R Script for Multilevel Model and Exploratory Analyses of Study 2

```
########################################
## LOADING THE DATA AND THE LIBRARIES ##
########################################
setwd("/Users/mzeinab/Downloads/Thesis/Van Data Analysis") ## update to your filepath as
appropriate ##
myd<-read.csv("Vanderbilt long data.csv")
summary(myd)
attach(myd)

library(dplyr)
library(nlme)
library(lme4)
library(MASS)
library(boot)
library(car)
library(lattice)
library(ggplot2)
library(multcomp)
library(stringr)
library(sjPlot)
library(sjmisc)
library(lavaan)
library(mlma)
library(manymome)
library(semTools)
library(magrittr)

##############################################
## Centering the Predictors and Mediators ##
##############################################
myd<- myd %>%
  group_by(day) %>%
  mutate(
   stressors.c = stressors - mean(stressors, na.rm = TRUE),
    Mach.D1.Avg.c = Mach.D1.Avg - mean(Mach.D1.Avg, na.rm = TRUE),
    Psych.D1.Avg.c = Psych.D1.Avg - mean(Psych.D1.Avg, na.rm = TRUE),
    Sadism.D1.Avg.c = Sadism.D1.Avg - mean(Sadism.D1.Avg, na.rm = TRUE),
    GN.D1.Avg.c = GN.D1.Avg - mean(GN.D1.Avg, na.rm = TRUE),
    VN.D1.Avg.c = VN.D1.Avg - mean(VN.D1.Avg, na.rm = TRUE),
    perceived.stress.c = perceived.stress - mean(perceived.stress, na.rm = TRUE),
    emotion.coping.c = emotion.coping - mean(emotion.coping, na.rm = TRUE)
  ) %>%
  ungroup()
```

```
centered_means <- myd %>%
        group_by(day) %>%
        summarise(
        mean.stressors = mean(stressors.c, na.rm = TRUE),
        mean.mach = mean( Mach.D1.Avg.c, na.rm = TRUE),
        mean.psycho = mean(Psych.D1.Avg.c, na.rm = TRUE),
        mean.sadism = mean(Sadism.D1.Avg.c, na.rm = TRUE),
        mean.gn = mean(GN.D1.Avg.c, na.rm = TRUE),
        mean.vn = mean(VN.D1.Avg.c, na.rm = TRUE),
        mean.perceivedstress = mean(perceived.stress.c, na.rm = TRUE),
        mean.coping = mean(emotion.coping.c, na.rm = TRUE)  )
        # Print centered means
        print(centered_means)

#### Create interaction terms ###

myd$stressors.Mach <- myd$stressors.c * myd$Mach.D1.Avg.c
myd$stressors.Psych <- myd$stressors.c * myd$Psych.D1.Avg.c
myd$stressors.Sadism <- myd$stressors.c * myd$Sadism.D1.Avg.c
myd$stressors.GN <- myd$stressors.c * myd$GN.D1.Avg.c
myd$stressors.VN <- myd$stressors.c * myd$VN.D1.Avg.c


#### Multilevel model test ###
## note that this does not converge. There are too many model parameters and too few people
and observations###

model1 <- '
level:1
# Define the relationships for a single stressor -> perceived stress -> emotion coping ->
depression
depression ~ b1*emotion.coping.c + b2*perceived.stress.c + b3*stressors.c + b4*stressors.Mach
+ b5*stressors.Psych + b6*stressors.Sadism + b7*stressors.GN + b8*stressors.VN
emotion.coping.c ~ e1*perceived.stress.c
perceived.stress.c ~ e2*stressors.c + e3*stressors.Mach + e4*stressors.Psych +
e5*stressors.Sadism + e6*stressors.GN + e7*stressors.VN

level:2
# Level 2: Include personality traits interacting with stressors to predict perceived stress
depression ~ c1*emotion.coping.c + c2*perceived.stress.c + c3*stressors.c + c4*stressors.Mach
+ c5*stressors.Psych + c6*stressors.Sadism + c7*stressors.GN + c8*stressors.VN
            + c9*Mach.D1.Avg.c + c10*Psych.D1.Avg.c + c11*Sadism.D1.Avg.c +
c12*GN.D1.Avg.c + c13*VN.D1.Avg.c

emotion.coping.c ~ d1*perceived.stress.c
```

```
perceived.stress.c ~ d2*stressors.c + d3*stressors.Mach + d4*stressors.Psych +
d5*stressors.Sadism + d6*stressors.GN + d7*stressors.VN
            + d8*Mach.D1.Avg.c + d9*Psych.D1.Avg.c + d10*Sadism.D1.Avg.c +
d11*GN.D1.Avg.c + d12*VN.D1.Avg.c

# Random intercepts for stressors and personality traits at Level 2
stressors.c ~~ stressors.c
perceived.stress.c ~~ perceived.stress.c
emotion.coping.c ~~ emotion.coping.c


# Indirect effects within Level 1
L1.stressor_ps_coping := e2 * e1 * b1
L1.total := b1 + (e2 * e1 * b1)

# Indirect and total effects between Level 2
L2.Mach.ps := e3 * c9
L2.Psych.ps := e4 * c10
L2.Sadism.ps := e5 * c11
L2.GN.ps := e6 * c12
L2.VN.ps := e7 * c13

L2.total1 := c9 + (e3 * c9)
L2.total2 := c10 + (e4 * c10)
L2.total3 := c11 + (e5 * c11)
L2.total4 := c12 + (e6 * c12)
'

# Fit the model with lavaan
fit1model1 <- sem(model1, data = myd, cluster = "participant.number")
summary(fit1model1, nd = 5L, fit.measures = TRUE)
lavInspect(fit1model1, "icc")



## Serial mediation that works!!! no interaction variables##

model1 <- '
# Level 1 relationships (serial mediation)
depression ~ b1*emotion.coping.c + b2*perceived.stress.c + b3*stressors.c
emotion.coping.c ~ e1*perceived.stress.c
perceived.stress.c ~ e2*stressors.c

# Covariances
stressors.c ~~ stressors.c
perceived.stress.c ~~ perceived.stress.c
```

```
emotion.coping.c ~~ emotion.coping.c

# Indirect effects
L1.indirect := e2 * e1 * b1  # stressor -> perceived stress -> coping -> depression
L1.total := b1 + b2 + b3 + L1.indirect  # Total effect of stressor on depression
'

# Fit the model
fit1model1 <- sem(model1, data = myd, cluster = "participant.number")
summary(fit1model1, nd = 5L, fit.measures = TRUE)
lavInspect(fit1model1, "icc")
```

Appendix H

Letter of IRB Approval

Office of Research Compliance
2269 Middle Tennessee Blvd.
Sam H. Ingram Bldg (ING) Room 010A
Box 124
Murfreesboro, TN 37132
www.mtsu.edu/irb

Date: November 5, 2024
PI: Zeinab Mostafa
Department: Middle Tennessee State University, Psychology
Re: Initial - IRB-FY2025-37
Nurse Recovery and Well-Being Study

The Middle Tennessee State University Institutional Review Board has rendered the decision below for the above referenced study.

Decision: Exempt
Category: Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects;

Findings:
Research Notes:

Please note that even though your proposed study is deemed exempt from further IRB review, the following apply to your approved study:

1. In accordance with 45 CFR 46.110, expiration dates do not apply to research eligible for Exempt Review under the Common Rule, and continuing review is not required by the IRB.
2. Any unanticipated harm to participants or adverse events must be reported to the Office of Compliance.
3. All modifications to the approved study must be submitted for review through Cayuse IRB for approval before their implementation. Adding new researchers constitutes a modification to the protocol. Per MTSU Policy, a researcher is defined as anyone who handles the data or interacts with participants. Everyone meeting this definition for this project must have completed the required CITI training and received IRB approval prior to becoming actively involved in the project.
4. Closure of the study must be submitted within Cayuse when the study ends or when personal identifiers are removed from the data and all codes and keys are destroyed.
5. All research materials must be retained by the PI for at least three (3) years after study completion and then destroyed in a manner that maintains confidentiality and anonymity.

Sincerely,

The Middle Tennessee State University Institutional Review Board