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The Assessment of Burnout and Resilience in Firefighters

Bailee Schuhmann

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THE ASSESSMENT OF BURNOUT AND RESILIENCE IN FIREFIGHTERS

By

Bailee Schuhmann

A Dissertation Presented to the College of Psychology
of Nova Southeastern University
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

NOVA SOUTHEASTERN UNIVERSITY

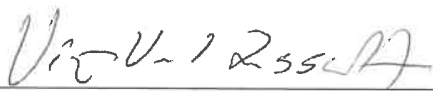
2022

APPROVAL PAGE

This Dissertation was submitted by Bailee Schuhmann under the direction of the Chairperson of the Dissertation committee listed below. It was submitted to the School of Psychology and approved in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Clinical Psychology at Nova Southeastern University.

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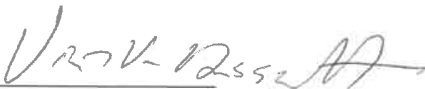


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Statement of Original Work

I declare the following:

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Bailee Schuhmann

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TABLE OF CONTENTS

LIST OF TABLES AND FIGURES.....	vi
ABSTRACT.....	1
CHAPTER I: STATEMENT OF THE PROBLEM.....	2
Stressors in the Fire Service.....	2
Consequences of Stress	4
Burnout.....	5
Burnout in the Fire Service.....	6
CHAPTER II: REVIEW OF THE LITERATURE.....	8
Resilience.....	8
Resilience in Firefighters.....	9
Relationship between Burnout and Resilience.....	9
Resilience Promoting Factors.....	10
Hope.....	11
Optimism.....	12
Social Support.....	13
Purpose of the Study.....	15
Hypotheses.....	15
CHAPTER III: METHODOLOGY.....	16
Participants.....	16
Measures.....	19
Demographics Questionnaire.....	19
Revised Hope Snyder Scale (HS-R2).....	19
Life Orientation Test- Revised (LOT-R).....	20
Multidimensional Scale of Perceived Social Support (MSPSS).....	20
Connor-Davidson Resilience Scale (CD-RISC).....	21
Maslach Burnout Inventory – General Survey (MBI-GS).....	22
Marlowe-Crowne Social Desirability Scale (MCSDS).....	24
Procedures.....	24
Data Analytic Plan.....	25
CHAPTER IV: RESULTS.....	29
Descriptive Data.....	29
Mediation Analyses.....	32
CHAPTER V: DISCUSSION.....	40
Limitations.....	43
Strengths.....	46
Clinical Implications.....	47
Future Research	48

REFERENCES..... 50

List of Tables of Figures

Table 1: Demographic Characteristics of the Sample	17
Table 2: Descriptive Statistics and Bivariate Correlations Between Study Variables....	31
Table 3: Model Coefficients for All Predictor Variables and Emotional Exhaustion with One Covariate.....	35
Table 4: Indirect Effects on Emotional Exhaustion.....	35
Table 5: Model Coefficients for All Predictor Variables and Cynicism with One Covariate	38
Table 6: Indirect Effects on Cynicism	39
Figure 1: Proposed Mediation Analyses.....	28
Figure 2: A Mediation Model evaluating the Relationship of three Antecedent (X) Variables (Hope, Optimism, and Social Support) to Burnout Domain Emotional Exhaustion, Through Resilience	34
Figure 3: A Mediation Model evaluating the Relationship of three Antecedent (X) Variables (Hope, Optimism, and Social Support) to Burnout Domain Cynicism, Through Resilience	37

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ABSTRACT

The occupational stress inherent to firefighting has consistently been associated in the literature with a number of adverse physiological and psychological risks. Several investigations have examined the dynamics of firefighter-related stress and job burnout. However, there is little research on strategies to promote resilience and reduce burnout in this population. Resilience refers to an individual's ability to "maintain relatively stable, healthy levels of psychological and physical functioning" when faced with adverse events and has been found to have a central role in coping with stressors and trauma (Bonanno, 2004, p.20). Extant research has identified factors such as hope, optimism and social support as being essential to the development of resilient responses to adversity and promoting overall well-being. The purpose of the present study was to identify factors that promote resilience in firefighters and examine their relationship to level of burnout. A series of six mediation analyses were conducted to evaluate whether resilience mediates the relationship between these individual, resilience-promoting factors (e.g., hope, optimism, and social support) and occupational burnout in a sample of 171 firefighters. Results revealed that resilience did not significantly mediate this relationship, however findings were directionally consistent with our hypotheses such that as hope, optimism and social support increase, individual resilience increases, in turn reducing burnout. Further, these results are likely influenced largely by our small sample size and high rates of socially desirable responding. This study highlights the importance of exploring positive psychology factors in understanding the reduction of job burnout among firefighters. By identifying personal factors associated with increased resilience and reduced burnout, more efficacious approaches can be implemented to improve stress management for firefighters. The implications of these findings including limitations and future directions are discussed.

CHAPTER I

Statement of the Problem

Firefighting has been acknowledged as one of the most stressful and dangerous occupations (Makara-Studzińska et al., 2019; Norwood & Rascati, 2012; Shantz, 2002). Firefighters are repeatedly exposed to traumatic and stressful events such as residential and commercial fires, death, and serious injury (Beaton et al., 1998). In addition, firefighters are often cross trained as emergency medical technicians (EMTs) or paramedics, requiring them to take on new responsibilities and permitting for greater exposure to traumatic events unrelated to fires, such as accidents, natural disasters, and medical emergencies (Skogstad et al., 2013; Straud et al., 2018). Given the variability in their responsibilities, as well as their inherent exposure to traumatic events, firefighters' psychological and physical health are significantly impacted (Makara-Studzińska et al., 2019; Sawhney et al., 2018; Steinkopf et al., 2016). Most notable are the indications of elevated rates of depression, sleep problems, alcohol abuse, and anxiety disorders in this population when compared to the general population (Carey et al., 2011; Steinkopf et al., 2016). In fact, research indicates the reported rate of posttraumatic stress disorder (PTSD) in firefighters ranges from 17% to 22% (Del Ben et al., 2006), while in the general population these rates are between 6.8% to 8% (American Psychiatric Association, 2013; Straud et al., 2018). While there are many regulations created for line-of-duty operations to promote safety and minimize injury in firefighters, the repeated exposure to traumatic events, and occupational and organizational stressors has contributed to adverse psychological reactions, including burnout (Smith et al., 2018).

Stressors in the Fire Service

The occupational environment of the fire service has been cited as an influential source of job-related stress (Beaton & Murphy, 1993). Occupational stressors can include fire-related emergencies, motor vehicle accidents, suicides, exposure to toxins, physical exertion, and excessive heat (Jahnke et al., 2012; Landrigan et al., 2004; Wagner & O'Neill, 2012). Rajabi et al. (2020) used a qualitative-descriptive study design to identify and prioritize occupational stressors in the fire service. After narrowing the selection to 27 stressors, they found that managerial domains of occupational stressors were reported to be the most impactful, more specifically, financial strain due to inadequate pay and a lack of attention paid to job safety by supervisors. Other highly rated stressors were fear of explosions and exposure to toxins on scene, problematic relationships among co-workers, and being criticized by peers and superiors.

Aside from occupational stressors, various organizational stressors in the fire service can impact a firefighter's health. Some organizational stressors identified in the literature include: shiftwork, overtime, excessive workload, departmental politics, lack of training, and conflicts with co-workers (Burna et al., 2018). While numerous studies have examined the impact of traumatic stressors, few have considered the impact organizational stressors can have on a firefighter's overall well-being (Sawhney et al., 2018). However, Brough (2004) found that organizational stressors predicted similar levels of psychological strain in firefighters when compared to traumatic stressors. This finding is conclusive with other literature investigating the impact of organizational stressors on individuals in the fire service (Armstrong et al., 2016; Haslam & Mallon, 2003; Meyer et al., 2012). In addition, chronic organizational stressors have also been shown to challenge the effectiveness of fire departments, as it can lead to high rates of

turnover, absenteeism, low production, job dissatisfaction, and loss of loyalty to the organization (Brough, 2004; Rajabi et al., 2020). Thus, emphasis should be also be placed on investigating the consequences of organizational stressors on the physical and mental health of firefighters.

Consequences of Stress

For first responders, occupational stress is inherent in their job; however, the effects of chronic stress can have detrimental effects on their wellbeing (Pignataro, 2013). Chronic stress can contribute to a deterioration of overall physical health with an increased risk of high blood pressure (Bautista et al., 2019; Lagraauw et al., 2015), headaches (Martin, 2016), gastrointestinal problems (Kolacz & Porges, 2018; Sexton et al., 2017), muscle tension (Wieckiewicz, et al., 2017), sleep disturbances (Straud, Henderson, Vega, Black, & Van Hasselt, 2018; Wolkow et al., 2015), weight fluctuation (Vicennati et al., 2009), metabolic syndromes (Garbarino & Magnavita, 2015), weakened immune system (Glaser & Kiecolt-Glaser, 2005), cancer (Prell et al., 2020), and cardiovascular disease (Brotman et al., 2007; Kivimäki & Kawachi, 2015). In fact, the risk of cardiovascular mortality is four times higher in professional firefighters than in other first responder groups, with reported rates reaching as high as 44% (Carey et al., 2011). Repeated exposure to critical incidents can also be a source for behavioral consequences. Irritability, aggression, impulsive behaviors, difficulty making decisions, poor concentration, and extreme sensitivity to criticism are commonly reported behavioral changes due to excessive stress (Rajabi et al., 2020). In 2015, the Federal Emergency Management Agency indicated that stress and overexertion accounted for 67% of firefighter fatalities the year prior (Sawhney et al., 2018). Despite the burgeoning

evidence demonstrating the negative effects of heightened stress in this population, very few resources exist to help firefighters cope with the stress of their occupational environment (Shantz, 2002), often leading to job burnout (Vlăduț & Kállay, 2010).

Burnout

Early research on burnout assisted in defining it as a psychological symptom to chronic exposure to work-related stressors, thereby normalizing the experience (Maslach & Schaufeli, 1993). As the understanding of burnout progressed, Maslach, Jackson, and Leiter (1996) went on to add, it is “a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishments that can occur among individuals who work with people” (p.4). Maslach’s (1993) earliest work on burnout focused primarily on human-service populations; however, the scope of this research eventually expanded to include other populations (Maslach et al., 1996). To accommodate the general population, the dimensions of burnout were altered to measure exhaustion, cynicism, and reduced personal efficacy. Exhaustion represents “the basic individual stress component,” (Maslach, 2005, p.100) and indicates a depletion or overextension of one’s personal resources. Building upon exhaustion, the second dimension, cynicism, refers to a detachment or negative attitude toward the job. Behaviorally, as one’s level of cynicism increases, the quality of their job performance typically decreases (Maslach, 2005). Finally, the reduced professional efficacy domain represents the self-evaluation component of burnout where an individual begins to experience feelings of incompetence, and lack of accomplishment or efficiency at work.

Burnout is thought to be a cycle: beginning with emotional exhaustion due to excessive efforts on coping with external demands, leading to behaviors of

depersonalization, and, lastly, ending with a reduced sense of personal accomplishment (Aronsson et al., 2017). An individual can exemplify these dimensions of burnout at work through their lack of energy to perform at work (e.g., exhaustion); diminished interest in maintaining an emotional connection with their work, workplace, or peers (e.g., depersonalization), and negative attitude towards recipients of their work (e.g., cynicism) (Smith et al., 2018). Feelings of exhaustion or fatigue begin to reach the level of burnout when an individual lacks the resources needed to bridge the gap between job demands and individual work capacity (Vinnikov et al., 2019).

In the general population of workers, prevalence of burnout ranges from 4 - 10% (Shirom, 2005) and affects an extensive range of professions including, but not limited to, teachers (Yu et al., 2015), police officers (Basinska et al., 2014), and health care workers (Martini et al., 2004; Oyeleye et al., 2013; West et al., 2018). High-risk occupations (i.e., surgeons) have observed rates of burnout as high as 75% (Martini et al., 2004; Pulcrano et al., 2016). High levels of burnout have consistently demonstrated negative impacts on the individual (e.g., depression, sleep disorders, anxiety, substance use), and the organization (e.g., increased absenteeism, decline in performance, low job satisfaction, high turnover) (Vladut & Kallay, 2010).

Burnout in Firefighters

Job burnout in firefighters has not only been associated with increase fatigue, diminished safety behaviors, increase in work-related injury, familial discord, PTSD, higher rates of absenteeism, and turnover (Basinska & Wiciak, 2012; Halbesleben et al., 2006; Katsavouni et al., 2016; Smith et al., 2018; Smith et al., 2020), but is experienced at rates comparable to or exceeding their first responder counterparts including police

officers and military personnel (Kaplan et al., 2017; Mitani et al., 2006). In a recent study, researchers found nearly 50% of US firefighters reported experiencing high rates of burnout on at least one of the three domains (e.g., emotional exhaustion, depersonalization, and personal accomplishment) (Wolkow, 2019). Additionally, the authors' noted firefighters with a sleep disorder, depression, anxiety or PTSD were at greater risk of experiencing higher levels of burnout.

Further, findings from Smith et al. (2018) indicated high rates of burnout negatively impacted firefighters' compliance to safety procedures. Specifically, the authors noted that firefighters were less likely to communicate their concerns regarding their personal safety, use protective equipment correctly, and follow through with procedures safely when burnt out. Consequently, increasing their risk of experiencing line-of-duty injuries. While a number of investigations have examined the dynamics of firefighter-related stress and job burnout, there is little research on burnout reduction in this population.

CHAPTER II

Review of the Literature

Resilience

In psychological research, resilience has been defined as “the process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances” (Masten et al., 1990, p. 426), and has emerged as a significant construct in explaining how humans cope with adversity. Resilience refers to an individual’s ability to “maintain relatively stable, healthy levels of psychological and physical functioning” when faced with adverse events (Bonanno, 2004, p. 20; Connor & Davidson, 2003), and has been found to play an important role in coping with stressors and trauma (Almedom, 2005; Austin et al., 2018; Bartone, 2006; Bonanno, 2004; Bonanno, et al., 2006; Honig & Sultan, 2004). Individuals with greater levels of resiliency typically report high levels of positive emotions, greater levels of internal locus of control, and better physical and mental health (Bonanno, 2004; Burns & Anstey, 2010; Connor & Davidson, 2003; Hu et al., 2015).

Further, one’s level of resilience can be thought of on a continuum. Thus, can be learned, and has been found to protect individuals against job-burnout and related conditions (Bartone, 2006). Research indicates relevant cognitive and behavioral mechanisms underlying resilience include optimism, social support, and cognitive flexibility, as well as engaging in active coping skills and physical activity (Iacoviello & Charney, 2020). Factors such as optimism, social support, and hope have been identified as significant contributors to psychological wellbeing and individual resilience (Masten, 2001; Reivich et al., 2011).

Resilience in Firefighters

Recent research has examined resilience in the fire service. One study found that greater resilience was associated with lower levels of depression, anxiety, and sleep disturbance, which, in turn, led to reduction of posttraumatic stress symptoms (PTSS) in a sample of 125 full-time firefighters in South Florida (Straud et al., 2018). Additionally, it has been found that social support from one's supervisor and coworkers positively influences resilience indirectly through employee health. Further, it was noted that social support was related to firefighters' resilience by means of energy and identification processes; meaning the firefighter felt motivated to work as a result of feeling a part of an organization (Bernabé, & Botia, 2016). Also, lack of social support has been found to negatively impact firefighter resilience. It was observed that actions denoting support, recognition, and social companionship from people in leadership positions were especially important to firefighters (Bernabé, & Botia, 2016). Bernabé, & Botia (2016) also observed intense emotional demands have an impact on resilience such that perceived social support from supervisors was important to subordinates at highly emotionally demanding times.

Relationship between burnout and resilience

Research has shown resilience is linked to the reduction of burnout through the alleviation of stress (Hao et al., 2015; Kaplan et al., 2017). Resilient individuals share a set of characteristics that allow them to cope and recover from experiencing stressful or traumatic situations, thereby minimizing the incidence of burnout (Iacoviello & Charney, 2020; Kaplan et al., 2017; Straud et al., 2018). Further, research has focused on the role of resilience in the prevention of psychiatric disorders. In fact, studies have found that

resilience can moderate the effects of chronic stressors or adverse events, including symptoms of PTSD (Iacoviello & Charney, 2020; Lee et al., 2014). Previous studies indicate that not all individuals exposed to traumatic or adverse situations will experience a trauma reaction (Agaibi & Wilson, 2005; Hodge et al., 2007). These findings highlight the relevance of resilience, or adaptation to adversity, as a protective factor (Lee et al., 2014).

Resilience Promoting Factors

To further aid in the development of resilience, it is important to identify personal characteristics that foster an adaptive stress response to better understand the attributes that contribute to variation in individual reactions to identical situations (Luthar & Cicchetti, 2000; Newman, 2005; Sarkar & Fletcher, 2017). By identifying such factors and processes that promote resilience, we can provide a structure for relevant and effective interventions to bolster resilience.

Resilient individuals have demonstrated certain attributes (e.g., positive emotion, high self-esteem and self-efficacy, positive self-image, optimism, sense of control, hope, active coping strategies, increase social support), that are associated with resilient responses to adversity (Balmer et al., 2014; Southwick & Charney, 2012; Torres & Gulliver, 2020). Additionally, these factors have been associated with positive work-related qualities across various occupations including perceived control in one's work environment and greater success (Luthans, Lebsack, & Lebsack, 2008), as well as greater engagement on the job (Bakker et al., 2006; Mache et al., 2014). More specifically, hope, optimism, and social support have been repeatedly cited as important contributing factors to increased resilience (Lee et al., 2013; Rushton et al., 2015; Southwick & Charney,

2012). Indeed, Martínez-Martí and Ruch (2017) found evidence to reinforce social support, optimism, and hope as predictors of resilience, with hope showing one of the largest correlations with resilience.

Hope

Hope has been defined as, “a cognitive set that is based on a reciprocally derived sense of successful (a) agency (goal-directed determination) and (b) pathways (planning of ways to meet goals)” (Snyder et al., 1991, p. 571). In 2002, Snyder revised his hope theory to include goals as the “cognitive component that anchors hope theory,” (p.250) providing a target for the mental processes. Research supports that reported higher levels of hope allow individuals to appraise their goals as challenging, while still allowing for the potential of success and positive outcomes. Thus, these individuals are capable of taking effective action in order to achieve a greater number of goals without perceiving it as a difficult (Snyder et al., 1991).

Moreover, hope has been recognized as an important protective factor and allows for individuals to present as confident when faced with stressful or adverse situations (Snyder, 1999; Snyder et al., 1991). Hope has also been attributed to lower levels of depression, having a positive outlook, higher levels of self-esteem, physical and psychological well-being, and resilience (Synder, 1999; Snyder, 2002; Karairmak, 2007). Satici (2016) identified hope as mediator in the relationship between resilience and reported well-being. Thus, higher levels of hopeful thoughts were associated with increased resilience and more affirmative evaluations of self. Further studies have emphasized the importance of hope in establishing resilience in assisting with the mitigating the effects of stress and increasing life satisfaction (Werner, 1993; Wu, 2011).

And, just as high levels of hope are associated with positive outcomes, low levels of hope are linked to lower levels of resilience in both younger and adult populations (Gooding et al., 2012).

Optimism

Two of the most cited theoretical conceptualizations influencing the definition of optimism are learned optimism (Seligman, 1998, 2006) and dispositional optimism (Carver & Scheier, 1998). Seligman (1998) describes learned optimism as an explanatory style where negative events are attributed to temporary, external, and unstable causes. On the other hand, Carver and colleagues (2010) defined dispositional optimism as, “an individual difference variable that reflects the extent to which people hold generalized favorable expectancies for their future” (p. 879) leading to the experience of more positive emotion regardless of adversity. Further, some literature suggests optimism is a stable trait (Carver et al., 2010), while other research has indicated it is a more malleable characteristic (Carver & Scheier, 2014; Seligman, 2006).

Optimism is associated with positive mood, effective coping, less distress, high morale, improved social functioning, and positive mental outcomes (Carver et al., 2010; Gillham et al., 2001; Srivastava, Bartol, & Locke, 2006; Vollman, Antoniw, Hartung, & Renner, 2011). In addition to improving psychological outcomes, increased optimism has been associated with improved health outcomes, such as decreased risk of cardiovascular disease and all-cause mortality (Rozanski et al., 2019).

While much of the research to date has focused on the relationship between optimism and physical and psychological well-being, a limited amount of research has focused on the role of optimism in settings such as the workplace. One study found

individuals that feel more optimistic about work showed had more positive attitudes about work, and more positive behaviors at work (Kluemper, 2009). Moreover, optimism has been cited as a protective factor against burnout in athletes (Chen et al., 2008) and associated with reduced burnout in medical students (Hojat et al., 2015).

Social Support

Social support is known to moderate stress, regulate emotions, and build engagement with others during times of stress (Bernabé & Botia, 2016; Zimet et al., 1988). It is seen as “an exchange of resources between at least two individuals perceived by the provider or the recipient to be intended to enhance the well-being of the recipient” (Shumaker & Brownell, 1984, p.13). An individual’s social support can vary by structure (i.e., persons included, the size of the social network), frequency (i.e. how often support is sought out), and function (i.e., providing emotional, instrumental, or informational support) (Kelly et al., 2017; Sippel et al., 2015). The benefit of social support has been noted across the literature. It has been found to reduce a number of psychological syndromes, including stress (Feeney & Collins, 2015); depressive symptoms (Pietrzak et al., 2010); and posttraumatic stress disorder (PTSD) symptoms (Zang et al., 2017). Moreover, individuals with a greater number of relationships perceived as supportive and gratifying demonstrate enhanced mental health and subjective well-being, as well as lower levels of mortality rates (Cohen, 2004; Uchino, 2009). Wilks & Spivey (2010) identified social support as being positively associated with resilience in a sample of undergraduate social work students.

Fire service organizations, including the International Association of Firefighters (IAFF) and International Association of Fire Chiefs (IAFC), have promoted the

establishment of peer support programs with the intent of having firefighters advocating mental wellness for one another (Stanley et al., 2019). Support received from co-workers has shown to improve the environment of a workplace by enhancing the self-perception of peers, encouraging the use of problem-solving skills, and diminishing feelings of ineffectiveness (Lambert et al., 2010). Perceived social support from peers has also shown to be beneficial among fire service members. Lee (2019) found that greater reports of perceived social support indicated lower self-reported intrusive rumination and PTSD symptoms in a firefighter sample.

Summary

Prior research has concentrated on identifying occupational and situational stressors that contribute to burnout, such as workload, role stress, and role conflict. Much of this research has specifically focused on those in helping professions (e.g., health care, social services, teaching, and childcare). However, far less information has been presented regarding personal characteristics or emotional profiles related to burnout, as well as how the relationship of occupational stress and burnout is presented in workers of other industries, including the fire service (Herbert, 2011). There is evidence to support that the relationship between workplace stressors and adverse psychological health can be mediated through factors such as social support, self-efficacy, coping strategies, and resilience (Duran et al., 2018). However, little research exists examining associations between resilience, potential underlying mechanisms (i.e., hope, optimism and social support), and burnout in firefighters. While many aspects of one's work environment may be difficult to change, protective factors such as hope, optimism and social support are modifiable and can be changed to increase one's resilience. Given the extensive

emotional, physical and occupational toll of burnout, investigation of these personal factors are warranted as they relate to resilience and burnout in firefighters.

Purpose of the Study

This project has three intertwined research objectives:

1. To determine whether optimism, social support, and hope have a negative association with burnout in firefighters.
2. To determine whether the association between optimism, social support, hope and reduced burnout is mediated by resilience.
3. To make recommendations and suggestions to the fire service and other researchers as to the needs of firefighters.

Hypotheses

Consistent with past research examining the relationship between personal factors, resilience, and burnout in correctional officers (Klinoff, 2018), our hypotheses are as follows:

H1: Hope, optimism and social support will have a negative indirect effect on the burnout domain of emotional exhaustion, which will be mediated by resilience above and beyond effects of social desirability.

H2: Hope, optimism, and social support will have a negative indirect effect on the burnout domain of cynicism, which will be mediated by resilience above and beyond effects of social desirability.

CHAPTER III

Methodology

Participants

The present study included 171 adult career ($n = 168$) and volunteer ($n = 2$) firefighters from various fire departments across states in the Southeastern United States including Florida, Texas, and Georgia. The study was inclusive of all active-duty firefighter personnel and no exclusionary criteria were applied. Demographic characteristics of the sample are presented in Table 1. According to Data USA (2019), males made up 95.8% of the fire service and 79.9% of firefighters in the United States were Caucasian in 2019. Demographic breakdowns of the current sample showed similar patterns with males (89.5%) and Caucasians (76.0%) being the gender and ethnicity most greatly represented. The age of participants ranged from 23 to 63 ($M = 42.08$, $SD = 9.66$). Further, the majority of the sample identified as married (70.2%). On average, participants had 16.09 years of service ($SD = 10.04$), making a large portion of the sample mid-career firefighters, with the overall range being from less than one year to 48 years. Over three-fourths (76.6%) of participants endorsed working in departments with an annual call volume over 10,000. Regarding rank, most respondents reported being a Firefighter (37.7%), followed by Lieutenant (19.3%), and then Driver/Engineer (16.4%). Additionally, the vast majority of the sample reported they were a certified Paramedic (83.6%). Further, most of the sample reported having either some college (31.6%) or an associate degree (32.7%).

Table 1.

Demographic Characteristics of Participants (N = 171)

Characteristic	n/M	%/SD
<u>Gender</u>		
Male	153	89.5
Female	18	10.5
<u>Age</u>	42.08	9.66
<u>Years of Service</u>	16.09	10.04
<u>Ethnicity</u>		
White/Caucasian	130	76.0
Hispanic	32	18.7
Black/African American	4	2.3
Asian	1	.6
Native Hawaiian or Other Pacific Islander	1	.6
Other	3	1.8
<u>Rank</u>		
Firefighter	64	37.4
Driver/Engineer	28	16.4
Lieutenant	33	19.3
Captain	22	12.9
Battalion Chief	14	8.2
Chief Officer	5	2.9
Other	5	2.9
<u>Highest Level of Medical Certification/Licensure</u>		

EMT Basic	16	9.4
EMT Intermediate	9	5.3
Paramedic	143	83.6
RN, MICN, or Other Nurse	2	1.2
Other	1	0.6

Department Annual Call Volume

Less than 1,000	2	1.2
1,001-5,000	10	5.8
5,001-10,000	28	16.4
Over 10,000	131	76.6

Marital Status

Married	120	70.2
Single	28	16.4
Divorced	13	7.6
Engaged	7	4.1
Separated	1	0.6
Other	2	1.2

Highest Education Level Completed

High School	9	5.3
Some College	54	31.6
Associates Degree	56	32.7
Bachelor's Degree	44	25.7
Master's degree	8	4.7

Measures

Demographic Questionnaire

A demographics questionnaire was used to collect sociodemographic characteristics such as gender, age, race, education, and marital status. Additional information relating to time in the fire service, rank, department call volume, military history, and health and medical information was collected. The demographic measure was used to describe the sample.

Revised Snyder Hope Scale (HS-R2)

The Revised Snyder Hope Scale (HS-R2; Shorey, Little, & Rand, 2009) is an 18-item revision of Snyder's (1991) Trait Hope Scale (THS). This instrument assesses an individual's hope as defined by one's perceived ability to: (a) adaptively formulate goals, (b) generate *pathways* to those goals, and (c) produce successful *agency* to use those pathways in the goal pursuit process. Several improvements were made in the revised version including, "(a) the new three-factor model maps more directly onto Snyder's (2002) definition of hope, (b) there are more items per subscale resulting in uniformly high reliabilities, (c) many items are now reverse scored to reduce positive response bias, and (d) items have lower overlap" (Shorey et al., 2009, p. 27). Respondents are asked to rate how well each item describes themselves on an 8-point Likert scale (1 = *Definitely False* to 8 = *Definitely True*). Sample items include, "I have trouble getting what I want in life," "I clearly define the goals that I pursue," and "I can think of many ways to get out of a jam." Total scores produced from the HS-R2 demonstrated good internal consistency reliability with alphas ranging from .88 to .91 in four independent samples of college students (Shorey et al., 2009). Given the addition of items to the HS-R2, it is not

surprising reliability estimates are higher than the THS. Cronbach's α in the present study was .87.

Life Orientation Test-Revised (LOT-R)

The Life Orientation Test-Revised (LOT-R; Scheier et. al., 1994) is a 10-item revised measure of the Life-Orientation Test by Scheier and Carver (1985), which assesses for optimism by inquiring about one's positive expectancy. Respondents are asked to indicate the extent of their agreement with statements such as "In uncertain times, I usually expect the best," and "I rarely count on good things happening to me." Items are rated using a 5-point Likert scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). Of note, only 6 of the 10 items on the LOT-R are used to calculate an optimism score. Four items are fillers, thus not used in scoring. Three of the 6 items are keyed in a positive direction, and 3 are keyed in a negative direction. Negatively worded items are reversed scored and then added with the positively worded items to compute an overall optimism score, ranging from 0 to 24, with higher scores being reflective of greater optimism. Cronbach's alpha for the 6 items used in scoring the LOT-R was .78. Test-retest reliability was examined using four samples of college students that were re-administered the LOT-R at the following time points: 4 months, 12 months, 24 months and 28 months. Test-retest correlations were .68, .60, .56 and .79, respectively. Convergent and discriminant validity was established by examining the strength of correlations between similar constructs including, neuroticism, self-mastery, self-esteem, trait anxiety and the original LOT (Scheier et. al., 1994). Cronbach's α in the present study was .82.

Multidimensional Scale of Perceived Social Support (MSPSS)

The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) is a 12-item scale that measures the perceived adequacy of support from the following three sources: family, friends, and significant other. Questions such as, “I have a special person who is a real source of comfort to me,” are rated on a 7-point scale ranging from *very strongly disagree* (1) to *very strongly agree* (7) (Zimet et al., 1988). Cronbach’s alpha for the significant other, family, and friends subscales were .91, .87, and .85, respectively. Additionally, the test-retest reliability for the significant other, family, and friends subscales were $r = .72, .85, \text{ and } .75$, respectively. Total scale scores produced from the MSPSS demonstrated good internal reliability ($\alpha = .88$) and adequate stability over time ($r = .85$; Zimet et al., 1988). This scale also demonstrated moderate construct validity as evidenced by the inverse relationships between MSPSS scores and scores on measures of anxiety and depression and has been utilized in previous research with firefighters and demonstrated high internal consistency reliability ($\alpha = .94 - .96$; Streeb et al., 2019). Cronbach’s α in the present study was .96

Connor-Davidson Resilience Scale (CD-RISC)

The Connor-Davidson (CD-RISC; Connor & Davidson, 2003) is a 25-item measure, which assesses level of stress coping ability over the past month (Connor & Davidson, 2003). Each item is rated on a 5-point scale (0 = *Not true at all* to 4 = *True nearly all of the time*), with higher scores reflecting greater resilience. Sample items include, “I am able to adapt when changes occur,” and “I tend to bounce back after illness, injury, or hardships.” The CD-RISC has been tested in the general population, as well as in clinical samples, and demonstrates sound psychometric properties. Cronbach’s alpha for full-scale scores was .89, with item-total correlations ranging from .30 to .70.

Additionally, test-retest reliability evaluations produced an interclass correlation coefficient of 0.87. CD-RISC scores were significantly correlated with measures of hardiness, and negatively correlated with measures stress, demonstrating significant convergent validity. No significant correlation was observed between CD-RISC scores and scores on the Arizona Sexual Experience Scale (ASEX), indicating adequate discriminant validity (Connor & Davidson, 2003). Cronbach's α in the present study was .95.

Maslach Burnout Inventory-General Survey (MBI-GS)

The Maslach Burnout Inventory – General Survey (MBI-GS; Schaufeli et al., 1996) is a 16-item measure that assesses a respondents' relationship with their work on a continuum from engagement to burnout. Respondents are asked to rate how frequently they experience each item, using a 7-point Likert scale (0 = *Never* to 6 = *Everyday*). Sample items include, "I feel emotionally drained from work," and "I doubt the significance of my work." This measure was created after the Maslach Burnout Inventory for human service populations, (MBI-HSS; Maslach & Jackson, 1981) which focuses on burnout as it relates to the service relationship (e.g., "I don't really care what happens to some recipients."). The MBI-GS was designed as an adaptation to be more general in nature for occupations without direct personal contact with service recipients or with only casual contact with people. Thus, the MBI-GS relates burnout to "a crisis in one's relationship with work, not necessarily a crisis in one's relationships with people at work" (Maslach, & Jackson, 1986, p.20). The sources of burnout in firefighters include other occupational factors (e.g., shift work, safety concerns, conflict with administration; Beaton & Murphy, 1993; Halbesleben, 2009; Smith et al., 2019) and transcend beyond

interactions with patients and/or victims. Thus, the MBI-GS was selected over the MBI-HSS for the purposes of this study.

The MBI-GS contains three subscales: Exhaustion, Cynicism, and Professional Efficacy. One study of the South African Police Service found internal consistency reliabilities to be the following: $\alpha = .88$ for exhaustion, $\alpha = .78$ for cynicism, and $\alpha = .79$ for professional efficacy (Storm & Rothmann, 2003). Other studies have documented similar results with Cronbach's alpha ranging from .84 to .91 for exhaustion, .77 to .84 for cynicism, and .73 to .78 for professional efficacy (Leiter & Schaufeli, 1996). Scores are calculated for each of the subscales by taking the average rating across the items within each subscale resulting in scores ranging from 0-6. Higher scores on cynicism and emotional exhaustion scales reflect greater burnout, whereas lower scores on the professional efficacy scale indicate greater levels of burnout.

Consistent with previous research and for purposes of this study, only the emotional exhaustion and cynicism subscales were utilized to quantify burnout, as they have been found to be the fundamental components of burnout (Green, Walkey, & Taylor, 1991; Schaufeli & Salanova, 2002, 2007; Schaufeli & Taris, 2005). Maslach & Leiter (1999) proposed that positive scores on professional efficacy would represent engagement, a construct intended to signify the opposite of burnout. However, some researchers have argued that engagement is independent of burnout, rather than its direct opposite (Leiter & Maslach, 2017) as evidenced by low correlations between the emotional exhaustion and cynicism dimensions (Halbesleben & Demerouti, 2005; Lee & Ashworth, 1996). Cronbach's α in the present study was .91 for emotional exhaustion and .82 for cynicism.

Marlowe-Crowne Social Desirability Scale (MCSDS)

The Marlowe-Crowne Social Desirability Scale (MCSDS; Crowne & Marlowe, 1960) is a 33-item measure examining the tendency to present oneself in an unrealistically favorable light. This measure was included because it has been found that first responder populations often under report difficulties (Coman & Evans, 1991; Sewell, 1981) and, therefore, are susceptible to a social desirability bias when answering self-report measures in research. Examples of items on this measure are, “I have never intensely disliked someone,” and “There have been occasions when I have taken advantage of someone.” Of the 33 items, 18 are keyed true and 15 false. Scores range from 0-33, with higher scores reflecting a tendency toward greater social desirability. Crowne and Marlowe (1960) reported a Kuder-Richardson-20 internal consistency coefficient of .88 and a test-retest reliability of .89 utilizing a sample of undergraduate students. Validation data for 39 undergraduates include correlations of .40 and .54 with the Minnesota Multiphasic Personality Inventory (MMPI) Correction and Lie scales, respectively. Further, a significant, positive correlation of .35 was found between MCSDS scores and the Edwards Social Desirability Scale scores (Crowne & Marlowe, 1960). In the present study, the MCSDS will be used as a covariate in the proposed meditation analyses to control for effects of socially desirable responding. Cronbach’s α in the present study was .81.

Procedures

Cross-sectional data were collected from various fire rescue departments across the southeastern region of the United States. In total, nine fire rescue departments and two firefighter organizations were initially contacted via telephone or email to recruit potential firefighter participants. Contacts were given an explanation of the study and its

procedures, informed of voluntary participation, the opportunity for compensation, and the secure survey link to Qualtrics electronic platform with instructions for completion. Of the nine departments contacted, six agreed to distribute the survey to its members.

Participating firefighters received an email containing a brief description of the study and a secure link to access the survey via Qualtrics electronic platform. Upon clicking the link, participants were directed to the Informed Consent page, which outlined all aspects of the study including purpose of the study, potential harm and benefit, voluntary participation, compensation, and duration of participation. Those who did not wish to participate had the option to indicate (by clicking ‘No’) that they did not wish to participate. Participants who indicated that they were interested in participating (by clicking ‘Yes’) were directed to complete the battery of demographic, resilience, and burnout questionnaires. Participants were given the option to receive compensation by entering their email address to receive a \$20 Amazon gift card upon completion of the survey. Further, ten validation questions, such as, “please select always if you are paying attention,” were scattered throughout the survey to ensure retention of valid responses for the analysis of the data. To maintain participants’ anonymity, all data were de-identified. This study was approved by the Institutional Review Board (IRB) of Nova Southeastern University.

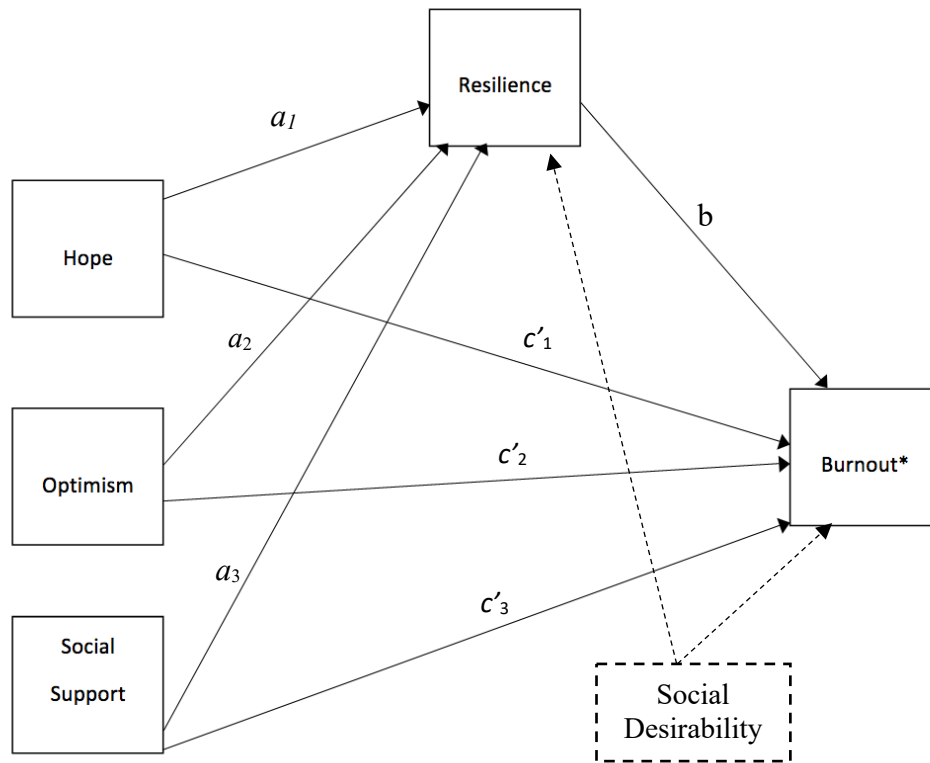
Data Analytic Plan

The following analyses were replicated from a previous study examining resilience and burnout in correctional officers (Klinoff, 2018). First, data were examined for missingness and random responding, as indicated by answering 80% of the ten validation questions correct (Berry et al., 2019; Niessen et al., 2016; Meade & Craig,

2012). Individuals' surveys that did not meet the 80% threshold were excluded from analyses. Missing data was handled via listwise deletion. Descriptive statistics were used to describe the sample's demographic and firefighter-specific characteristics. Normality checks were conducted and correlations between study variables were evaluated. Next, a series of six mediational analyses were employed using a nonparametric bootstrapping approach through PROCESS (Hayes, 2022) with hope, optimism, and social support serving as predictor variables, resilience as the mediating variable, and burnout domains (e.g., emotional exhaustion and cynicism) as the outcome variable (see Figure 1). Social desirability was included as a covariate in all analyses given the demonstrating the propensity for first responders' to present themselves in a more favorable light when asked about mental health and work (Tommasi et al., 2021). Further, predictors variables not of primary interest in the particular model were entered as a covariate to account for their effects (e.g., when examining effect of hope, optimism and social support were entered as covariates in the model to control for overlapping effects). Ten thousand bootstrap samples were used to estimate 95% confidence intervals (CI).

A mediation analysis is a statistical method used to test hypotheses about a causal system in which a predictor variable (X) is proposed to affect an outcome variable (Y) through an intervening, or mediating, variable (M). In such a model, X may influence Y through both direct and indirect pathways. The direct pathway examines the relationship of X to Y without passing through M. Whereas, the indirect effect is determined by the product of two relations: the impact of the antecedent X to consequent M, or the "a" path, and the effect of the mediator M to outcome Y after controlling for the antecedent, or the "b" path (Hayes, 2022). Indirect effects are interpreted as significant if the 95% CI do not

include zero. All analyses were conducted using SPSS version 28 and were evaluated at the .05 alpha level for significance.

Figure 1*Proposed Mediation Analyses*

Note. *Burnout as measured by emotional exhaustion and cynicism subscales of the MBI.

CHAPTER IV

Results

Descriptive Statistics

Descriptive data and correlations for each of the assessment measure scores are presented in Table 2. A total of 267 responses were recorded. Responses that did not answer 80% of the embedded validation questions were removed from the analysis to control for random responding. After removal, a total of 171 valid responses remained. Of the 171, 2 responses had some degree of missing data and were excluded from the analysis if they were missing data on measures of interest.

The mean value of the participants on the resilience measure (CD-RISC) was similar to means obtained from previous research on resilience in firefighter samples from the same region ($M = 77.93$, $SD = 12.39$; Straud et al., 2018) ($M = 75.15 - 79.48$, $SD = 11.36 - 14.38$; Denkova et al., 2020). Scores on hope (HS-R2) in our sample were relatively similar to correctional officer's scores on the same scale in prior research ($M = 6.66$, $SD = 0.67$; Klinoff et al., 2018). The mean of the participants' responses on perceived social support (MSPSS) in the present study is consistent with recent investigations examining perceived social support among Canadian firefighters ($M = 5.46$, $SD = 1.12$; Brais et al., 2022). The sample mean on the measure of optimism (LOT-R) was similar to a population of German adults ($M = 15.2$, $SD = 3.8$; Glaesmer et al., 2012) and career US firefighters ($M = 16.23$, $SD = 3.74$; Landen & Wang, 2010), however slightly lower than Polish police officers ($M = 18.06$, $SD = 4.64$; Oginska-Bulik, 2005). Participants in our sample scores higher on assessments of social desirability (MCSDS) than the normative group of college students ($M = 16.82$, $SD = 5.5$; Crowne &

Marlowe, 1960) and a sample of correctional officers ($M = 16.13$, $SD = 8.63$; Klinoff et al., 2018). The participants' mean burnout scores on the emotional exhaustion domain (MBI-GS Emotional Exhaustion) was comparable to that of a Canadian military norm group ($M = 2.05$, $SD = 1.23$; Maslach et al., 1996) correctional officers in the United States ($M = 1.98$, $SD = 1.65$; Klinoff et al., 2018), however higher than firefighters in Kazakhstan ($M = 0.6$; Vinnikov et al., 2019). Further, mean scores for the cynicism domain (MBI-GS Cynicism) were consistent with the aforementioned military normative group ($M = 1.63$, $SD = 1.35$; Maslach et al., 1996), correctional officers ($M = 2.07$, $SD = 1.54$; Klinoff et al., 2018), and firefighters from Kazakhstan ($M = 1.2$; Vinnikov et al., 2019).

Table 2*Descriptive statistics and bivariate correlations between study variables (N=171)*

	Hope	Optimism	Social Support	Resilience	Cynicism	Emotional Exhaustion	Social Desirability
1. HS-R2 Total ^a	-						
2. LOT-R Total ^b	.551**	-					
3. MSPSS Total ^c	.450**	.279**	-				
4. CD-RISC Total ^d	.712**	.451**	.534**	-			
5. MBI Cynicism ^e	-.307**	-.377**	-.170*	-.243**	-		
6. MBI Emotional Exhaustion ^f	-.255**	-.279**	-.116	-.216**	.593**	-	
7. MCSDS Total ^g	.451**	.335**	.168*	.354**	-.364**	-.350**	-
Mean	6.43	15.68	5.58	72.71	1.71	1.87	20.12
SD	0.89	4.13	1.27	17.60	1.41	1.47	5.44
Range	1-8	0-24	1-7	0-100	0-6	0-6	0-33

Note. * $p < .05$, ** $p < .01$; *SD*=standard deviation; ^aRevised Snyder Hope Scale total score; ^bLife-Orientation Test-Revised total score; ^cMultidimensional Scale of Perceived Social Support total score; ^dConnor-Davidson Resilience Scale total score; ^eMaslach Burnout Inventory-General Survey (Cynicism) subscale score; ^fMaslach Burnout Inventory-General Survey (Emotional Exhaustion) subscale score; ^gMarlowe-Crowne Social Desirability Scale total score.

Mediation Analysis

Assumptions underlying linear regression were examined and found to be tenable as evidenced by a random scattering of the standardized residuals against standardized predicted values (Pituch & Stevens, 2015). Furthermore, there was no evidence of excess multicollinearity among predictors (variance inflation factors [VIF] < 2.4; Pituch & Stevens, 2015). Mediation analysis using percentile bootstrap methodology (generating 10,000 reiterations of the sample) were utilized to examine the direct and indirect influence of hope, optimism, and social support on burnout domains (i.e., emotional exhaustion, cynicism) through their influence on resilience. A series of six mediation analyses were conducted using PROCESS version 4.1 (Hayes, 2022) in SPSS. The seed was set to a random integer (278057) generated by the lead investigator when performing all bootstrap analyses so as to guarantee the replicability of results. Level of significance was set at $\alpha=.05$.

Indirect Effects of Hope, Optimism, and Social Support on Emotional Exhaustion as Mediated by Resilience

A mediation analysis, using ordinary least squares path analysis, revealed there was not a significant indirect effect of hope on emotional exhaustion through its effect on resilience ($ab = -.020$; 95% CI [-.260, .193]). Further, there was not a significant direct effect of hope on emotional exhaustion ($c' = -.064$, $p = .737$).

In addition, it was found that indirect effect of optimism on emotional exhaustion through its relationship with resilience was non-significant ($ab = -.0004$; 95% CI [-.014, .006]). Furthermore, there was no evidence that optimism influenced emotional exhaustion independent of its effect on resilience ($c' = -.052$, $p = .096$).

Lastly, there was not a significant indirect effect of social support via resilience on emotional exhaustion ($ab = -.007$; 95% CI $[-.076, .074]$). Additionally, social support did not significantly influence emotional exhaustion independent of its effect on resilience ($c' = -.012$, $p = .896$). See Figure 2 for a schematic representation of the mediation model, Table 3 for model coefficients and p values, and Table 4 for the unstandardized and standardized indirect effects and confidence intervals.

Figure 2.

A Mediation Model evaluating the Relationship of three Antecedent (X) Variables (Hope, Optimism, and Social Support) to Burnout Domain Emotional Exhaustion, Through Resilience.

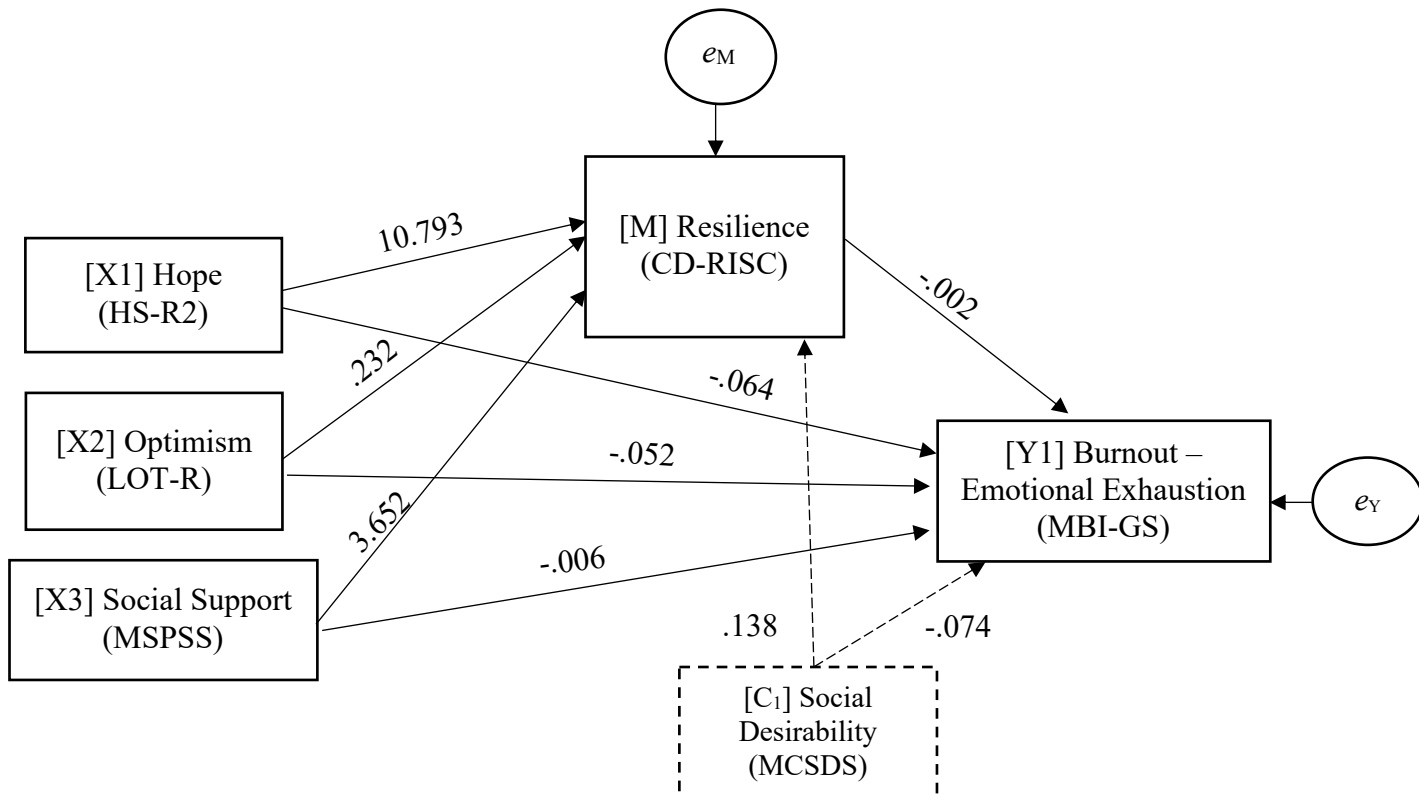


Table 3*Model Coefficients for All Predictor Variables and Emotional Exhaustion with One Covariate*

Predictor	Outcome							
	Resilience (<i>M</i>)				Emotional Exhaustion (<i>Y</i>)			
	Coefficient	<i>SE</i>	<i>p</i>		Coefficient	<i>SE</i>	<i>p</i>	
Hope (<i>X</i> ₁)	<i>a</i>	10.793	1.393	<.001**	<i>c'</i>	-.064	.191	.737
Optimism (<i>X</i> ₂)	<i>a</i>	.232	.266	.385	<i>c'</i>	-.052	.031	.096
Social Support (<i>X</i> ₃)	<i>a</i>	3.652	.797	<.001**	<i>c'</i>	-.006	.099	.956
Resilience (<i>M</i>)	—	—	—	—	<i>b</i>	-.002	.009	.843
Constant	<i>i</i> ₁	-23.533	6.695	<.001**	<i>i</i> ₂	4.739	.815	<.001**
<i>C</i> ₁ (Social Desirability)	<i>a</i>	.138	.187	.461	<i>b</i>	-.074	.022	.001*
Overall Model: $R^2 = .570$ $F(4, 164) = 54.405, p < .001$				Overall Model: $R^2 = .151$ $F(5, 163) = 5.788, p < .001$				

Note: * $p < .05$. ** $p < .001$.

Table 4*Indirect Effects on Emotional Exhaustion*

Predictor	Outcome: Emotional Exhaustion							
	<i>ab</i>	<i>SE</i>	CI		<i>ab</i> ^a	<i>SE</i> ^a	CI	
			LL	UL			LL ^a	UL ^a
Hope	-.020	.114	-.260	.193	-.012	.069	-.157	.120
Optimism	-.0004	.005	-.014	.006	-.001	.013	-.040	.016
Social Support	-.007	.038	-.076	.074	-.006	.033	-.063	.069

Note. ^a Completely standardized effects and confidence intervals

Indirect Effects of Hope, Optimism, and Social Support on Cynicism as Mediated by Resilience

Mediation analysis revealed there was not a significant indirect effect of hope via resilience on cynicism ($ab = .015$; 95% CI [-.196, .227]). There was no evidence that hope influenced cynicism independently of its effect on resilience ($c' = -.057$, $p = .749$).

In addition, it was found that that indirect effect of optimism on cynicism through its relationship with resilience was non-significant ($ab = .0003$; 95% CI [-.011, .007]). However, there was a significant direct effect of optimism on cynicism independent of its effect on resilience ($c' = -.092$, $p = .002$).

Lastly, there was not a significant indirect effect of social support via resilience on cynicism ($ab = .005$; 95% CI [-.059, .085]). Additionally, there was no evidence that social support influenced cynicism independently of its effect on resilience ($c' = -.046$, $p = .616$).

Of note, all six analyses partitioned out the two other independent variables when examining the indirect effects. In addition, the analyses controlled for potential effects of socially desirable responding by including the MCSDS measure as a covariate. (See Figure 3 for a schematic representation of the mediation model, Table 5 for model coefficients and p values, and Table 6 for the standardized indirect effects and confidence intervals.)

Figure 3.

A Mediation Model evaluating the Relationship of three Antecedent (X) Variables (Hope, Optimism, and Social Support) to Burnout Domain Cynicism, Through Resilience.

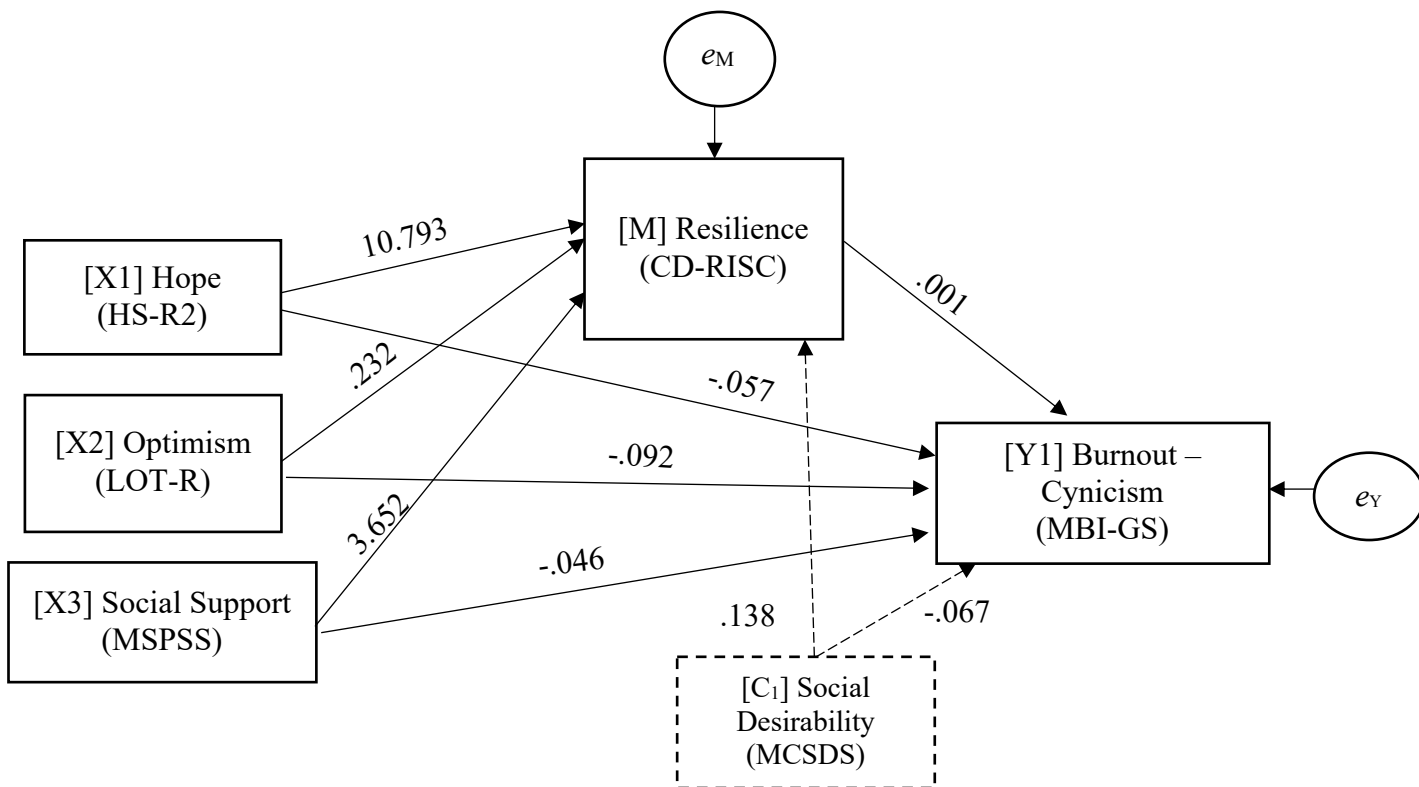


Table 5*Model Coefficients for All Predictor Variables and Cynicism with One Covariate*

Predictor	Outcome							
	Resilience (<i>M</i>)				Cynicism (<i>Y</i>)			
	Coefficient	<i>SE</i>	<i>p</i>		Coefficient	<i>SE</i>	<i>p</i>	
Hope (<i>X</i> ₁)	<i>a</i>	10.793	1.393	<.001**	<i>c'</i>	-.057	.178	.749
Optimism (<i>X</i> ₂)	<i>a</i>	.232	.266	.385	<i>c'</i>	-.092	.029	.002*
Social Support (<i>X</i> ₃)	<i>a</i>	3.652	.797	<.001**	<i>c'</i>	-.046	.093	.616
Resilience (<i>M</i>)	—	—	—	—	<i>b</i>	.001	.009	.873
Constant	<i>i</i> ₁	-23.533	6.695	<.001**	<i>i</i> ₂	5.020	.759	<.001**
<i>C</i> ₁ (Social Desirability)	<i>a</i>	.138	.187	.461	<i>b</i>	-.067	.021	.001*
Overall Model: $R^2 = .570$ $F(4, 164) = 54.405, p < .001$				Overall Model: $R^2 = .209$ $F(5, 163) = 8.602, p < .001$				

Note: * $p < .05$. ** $p < .001$.

Table 6*Indirect Effects on Cynicism*

Outcome: Cynicism								
Predictor	<i>ab</i>	<i>SE</i>	CI		<i>ab</i> ^a	<i>SE</i> ^a	CI	
			LL	UL			LL ^a	UL ^a
Hope	.015	.107	-.196	.227	.009	.068	-.119	.147
Optimism	.000	.004	-.011	.007	.001	.012	-.031	.021
Social Support	.005	.037	-.059	.085	.005	.034	-.050	.083

Note. ^a Completely standardized effects and confidence intervals (i.e., removes scaling from X and Y and expresses effects in terms of standard deviations in Y between two cases that differ by one standard deviation in X) (Hayes, 2022)

CHAPTER V

Discussion

Firefighters are unique group that are exposed to traumatic incidents daily, therefore at greater risk for developing negative mental health sequelae. Additionally, occupational stressors such as exposure to toxin, intense physical exertion, inadequate equipment, and administrative conflict contribute to the overall buildup of stress (Jahnke et al., 2012; Landrigan et al., 2004; Rajabi et al., 2020; Wagner & O'Neill, 2012). An abundance of research has focused on identifying risk factors for various mental health disorders in firefighters (Chamberlin & Green, 2010), however there is a paucity of research examining resilience promoting factors, particularly in the firefighter population. Previous literature has established positive relationships between individual factors such as hope, optimism, and social support, and resilience (Gallagher et al., 2019; Ong et al., 2018; Segovia et al. 2012; Torres & Gulliver, 2020), and the mediating role of resilience on decreasing burnout (Duarte et al., 2022; Klinoff, 2018). However, to date, no study has examined how resilience influences the relationship of these personal strength factors and burnout. The purpose of this study was to (1) determine whether optimism, social support, and hope have a negative association with burnout in firefighters, (2) determine whether the association between optimism, social support, hope, and reduced burnout is mediated by resilience, and (3) provide avenues for future research to address firefighter burnout and overall wellness. It was hypothesized that the relationship between individual resilience-promoting factors (e.g., hope, optimism, and social support) and domains of burnout (e.g., emotional exhaustion and cynicism) would be mediated by resilience. The study aims is to increase knowledge regarding the structure of individual

strength in burnout reduction of firefighters through the novel conceptual model previously applied to correctional officers (Klinoff et al., 2018).

Findings from this research did not support our hypotheses. On the contrary, results indicated that the effects of hope, optimism, and social support on burnout through resilience were not statistically different from zero. Although results did not reach significance, they were directionally consistent with the hypothesis such that hope, optimism and social support had positive effects on resilience, which, in turn, reduced emotional exhaustion in firefighters. Similarly, an increase in hope, optimism, and social support led to an increase in resilience, which, in turn, led to a decrease in cynicism. The findings from this study are inconsistent with prior literature examining the relationship between hope, optimism, social support, resilience and burnout in other first responder groups (e.g., correctional officers; Klinoff, 2018). This may be, in part, due to the relatively small sample size in the current study. Previous research has found mediational effects at samples sizes of 300 (Klinoff, 2018), thus our analyses may not have been adequately powered to detect a significant effect, resulting in Type II error of failing to reject the null hypothesis when effect is actually present in the population.

Another possible explanation into these findings is highlighted by a recent statement made by Dr. Maslach (2022), where she states, “Burnout is often mistakenly labeled a problem of individual health care providers, leaving the underlying systemic and cultural problem unaddressed” (slide 3). The model examined did not account for any organizational factors influencing resilience and burnout in fire rescue personnel. This may be of particular importance in this population given the cohesion of their work environment (i.e., 24-hour work shift, conducting work responsibilities as a unit, and

structure of the fire house). Maslach (2022) goes on to comment that traditional approach to assist employees in coping with ongoing stressors is not sufficient to address the syndrome of burnout. However, one should focus on the match between the person and the job. It is possible that for firefighters, organizational factors, rather than individual, have a larger influence on their overall burnout levels, or rather an interaction of work-setting characteristics along with personal characteristics (Bolzon & Nalmasy, 2021; Burke & Greenglass, 1995; Cherniss, 1980). Future research would benefit from examining the person-to-job fit for this occupation.

Further, extant research has identified several additional individual, situational and organizational factors that influence resilience in firefighters beyond hope, optimism and social support (Torres & Gulliver, 2020). It is possible that other factors identified in the literature have greater influence on the development of resilience and reduction of burnout in firefighters than the ones identified in the present study. Indeed, there are several differences between firefighters and correctional officers that may explain the inconsistencies in our findings from previous work (Klinoff, 2018). Tracy and Scott (2006) describe the occupational role difference between firefighters and correctional officers as, “America’s Heros” and the “Scum of Law Enforcement” (p.6), alluding to the perceived difference in a savior/helper role, versus punisher role. While both occupations face situations that are both psychically and socially unattractive, firefighters have the luxury of public admiration and being idealized. “Although officers must navigate disdainful societal perceptions that they are sadistic purveyors of cruelty, firefighters appreciate a ‘status shield’ that essentially protects them from tainted characterizations of their work. This image allows them to focus on the ways children idolize them, rather

than on the everyday dirt in their job” (Tracy & Scott, 2006, p.18) Thus, their cognitive appraisals of their meaning of work may influence the relationship between resilience and burnout beyond the variables captured in our model.

Limitations

There are several limitations in the present study that should be noted. First, as mentioned above, a major limitation of the current investigation is the sample size. Data were collected during covid, thus impacted recruitment efforts, and investigators did not hit the target sample size for this study. As such, it is possible that our analyses were not adequately powered to detect a true effect in the population. While we did not achieve significance in our results, the direction of our findings were consistent with our hypotheses. It would be valuable for future researchers to replicate this model in a larger sample of firefighters.

Another limitation that warrants mention is the influence of social desirability on participant’s responses. In the current study, social desirability (MCSDS) scores were significantly correlated with all study variables (ranging from $-.34$ to $.45$), suggesting participant’s responses were potentially influenced by the desire to respond in a socially favorable manner. Scores on hope, optimism, social support, and resilience were significantly, positively correlated to scores on social desirability, suggesting that participants may be overestimating their level of these psychological attributes. However, scores of burnout (emotion exhaustion and cynicism) were significantly, negatively correlated with social desirability scores, indicating participants may be under reporting their true level of burnout. This finding highlights that social desirability is strongly impacting research and consistent with observations in prior research with firefighters

(Schuhmann et al., 2022; Tomassi et al., 2021). Future studies would likely benefit from incorporating measures detecting tendencies to respond in socially favorable ways into research with first responders. It also may warrant future efforts examining methods and conditions that reduce the propensity for this bias in responding such as online versus paper and pencil surveys, source of survey distribution, and types of measures utilized.

Third, this study utilized a cross-sectional design which does not allow for explicitly establishing the causal ordering of the relationship between variables observed. This study assumed a direction of causal mediation such that individual protective factors lead to greater levels of resilience, which then leads to reduced burnout on domain of emotional exhaustion and cynicism. Alternatively, it is possible that individuals with higher level of resilience develop positive psychology factors, and in turn, experience reduction in burnout. However, Hayes (2022) states, “We don’t use statistical methods to make causal inferences. Establishing cause and effect is more a problem in research design and logical analysis than one in data analysis,” and argues that temporal precedence can be, and is often, established through theoretical foundations, making mediational analyses appropriate for use in cross-sectional studies (p.17). Despite the analyses themselves being unable to provide temporality of the variables examined, the proposed order and relationship have been established from extensive theoretical research as previously cited.

Finally, participants were recruited from a convenience sample. The fire rescue departments contacted were chosen due to the feasibility of collecting participants given the principal investigator’s previous working relationship with the departments or word of mouth. This may have implications for generalizability of results to the population as a

whole (Kazdin, 2017). Albeit, our sample represented a wide range of ages, ethnicities, rank, years of service, and was consistent with the demographic breakdown of the fire service nationally.

Strengths

Although there were several limitations to this study, there were also many strengths that deserve mention. To our knowledge, this is the first study examining the relationship between personal strength variables, resilience and occupational burnout in firefighters, an understudied population. This provides a new framework for prevention and intervention that shifts from risk factors, vulnerabilities, or deficits, to enhancing personal strengths and bolstering protective factors. This is of particular importance in an occupational culture where mental health has historically been stigmatized and services underutilized (Henderson et al., 2016). By approaching mental health concerns from a positive psychology perspective, we dispel myths that mental health problems are a sign of weakness, failure or personal defect and barriers to engaging with mental health resources and programs can be reduced. This research extends beyond previous literature citing the correlational or cause and effect associations between positive variables and burnout by placing the relationship between these variables within a new model that highlights one mechanism (e.g., resilience) through which these positive variables impact occupational burnout.

Additionally, while face valid, self-report measures are susceptible to response bias, our study included validation questions scattered throughout the survey in an effort to control for these effects of random responding. Additionally, efforts were made to

control for the influence of socially desirable responding through inclusion of the Marlowe-Crowne Social Desirability Scale.

Clinical Implications

The findings from this study have broad implications for clinical prevention and intervention programs. Currently, there are very few behavioral health and wellness programs available to firefighters. As it stands, many departments rely on Employee Assistance Programs (EAPs) to refer their members to mental health services. However, firefighters have reported limited use of “in house” services such as EAPs due to concerns of confidentiality, clinician understanding of fire culture, and potential negative perceptions of being “weak” (McMahon, 2010; Schuhmann et al., 2021). In addition to EAPs, Critical Incident Stress Management (CISM) has been utilized as a first-line approach to targeting firefighter behavioral health. CISM is a “package” of crisis intervention tactics intended to mitigate the impact of traumatic exposure, aid in the natural recovery for individuals experiencing a normal response to an abnormal event, and restore adaptive functioning at individual, and group and organizational levels, and identify folks who may benefit from further referral (Mitchell, 2020). CISM has garnered inconclusive support in the literature with some studies citing its benefits, and some positing its potentially harmful effects (Gulliver et al., 2018). In recent years, larger departments have turned to the use of peer support teams in an attempt to attenuate the impact of occupational stressors, exposure to traumatic events, and promote resilience (Cnapich et al., 2022; Feuer, 2021). However, empirical support for such programs is at its infancy and a wider effort to design evidence-based prevention and intervention programs that integrate resilience promoting factors is needed.

In consideration of the present results and extant literature, it is recommended that resilience-promoting factors be introduced into recruit training and discussed during refresher trainings throughout the career span of a firefighter in an effort to improve resilience. Programs and trainings should aim to foster hope, optimism, and social support through various techniques including: (a) identifying unhelpful thinking styles common across the occupation, (b) challenging thoughts to develop a more balanced appraisal of adversity, (c) providing adequate outlets for expression of emotion (e.g., CISD), (d) engage in problem-solving strategies to improve agency and pathway to achieving one's goals and desired outcomes when dealing with stressors, and (e) promoting social interaction through both the structure of the work environment (i.e., inviting communal space, living quarters that deter isolation) and inclusion of families/significant others into station life when applicable (Deppa & Saltzberg, 2016). By incorporating positive psychology factors into behavioral health and wellness programs in the fire service, it helps shift the focus from "pathology and deficit" to "personal strengths" which may result in greater willingness to engage with mental health resources (Klinoff, 2018).

Conclusion and Future Directions

In conclusion, firefighters are unique group that are exposed to traumatic incidents daily, therefore at greater risk for developing negative mental health sequelae. Additionally, occupational stressors may be contributing to increased stress. An abundance of research has focused on identifying risk factors for various mental health disorders in firefighters (Chamberlin & Green, 2010), however there is a little research examining resilience promoting factors, particularly in the firefighter population.

Through the study of psychological resilience, we will be able to better understand why some individuals are able to withstand – or even thrive on – the pressure they experience in their lives. Of note, resiliency is not a stable trait. Rather, resilience is a malleable and can be better or worse depending on the circumstance (Luther & Cicchetti, 2000).

Therefore, these skills are teachable. By understanding factors that contribute to increased resilience and reduced burnout, we can help firefighters mitigate negative stress reactions before they occur. It was anticipated the results of this study would serve as an important step in identifying strategies to protect fire rescue personnel from job stress, burnout, and related problems. Although our expected findings were not fully supported, this study highlights the need for mental health practitioners and fire rescue agencies to collaborate in building the scientific literature to better understand the relationship between individual factors, resilience and job burnout as this has implications for the costs, outcomes and effectiveness of prevention and intervention programs for this population.

Future research in this area would benefit from expanding the research question to test more complex models that include additional variables associated with resilience. It would also be useful for future investigations to explore the interaction of individual factors, and organizational factors into the understanding of the association between resilience and burnout as well as examine factors that influence person-to-job fit. It is recommended that future researchers go beyond the cross-sectional design and conduct longitudinal studies that allows the establishment of temporal order underlying the relationship between various variables involved in firefighter burnout. Moreover,

replication of the current model in a larger sample of firefighters may yield alternative results, adding meaningful contributions to the literature.

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