

2021

Assessment of Psychological Functioning in Retired Firefighters

Jordana Simone Pepper

Nova Southeastern University, jordanasimone@gmail.com

Follow this and additional works at: https://nsuworks.nova.edu/cps_stuetd



Part of the [Psychology Commons](#)

Share Feedback About This Item

NSUWorks Citation

Pepper, J. S. (2021). Assessment of Psychological Functioning in Retired Firefighters. .
Available at: https://nsuworks.nova.edu/cps_stuetd/148

This Dissertation is brought to you by the College of Psychology at NSUWorks. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of NSUWorks. For more information, please contact nsuworks@nova.edu.

TITLE PAGE

**ASSESSMENT OF PSYCHOLOGICAL FUNCTIONING IN RETIRED
FIREFIGHTERS**

by

Jordana Simone Pepper

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

2020

DISSERTATION APPROVAL PAGE

This Dissertation was submitted by Jordana Simone Pepper 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.

08/17/2020

Date of Defense

Approved:

DocuSigned by:
Vincent Van Hasselt, PhD
6320837AF7FF49C...

Vincent Van Hasselt, Ph.D., Chairperson

DocuSigned by:
Barry Schneider, PhD
C692D125E4004B0...

Barry Schneider, Ph.D.

DocuSigned by:
Ryan Black, PhD
FE65CEB31CDA4A6...

Ryan Black, Ph.D

8/17/2020

Date of Final Approval

DocuSigned by:
Nathalie de Fabrique Stepp, PsyD
8905D8308C1F448...

Nathalie de Fabrique Stepp, Psy.D.

ACKNOWLEDGEMENTS

There are many people that I would like to acknowledge and thank for their help, kindness, and support during the preparation of this dissertation. First and foremost, I would like to thank my advisor, Dr. Vincent Van-Hasselt for his invaluable guidance, wisdom, and encouragement throughout this process. We began working on this project during my first year of graduate school, and under his tutelage it has grown into work that will hopefully benefit countless first responders in the future. I would also like to thank my other committee members, Dr. Black, Dr. Schneider, and Dr. Stepp for believing in the practical applications of this project, and for their support and guidance throughout the creation of this dissertation (especially in statistics!)

To my mom, dad, sister, Bubby, and Muzzy, there are no words to adequately describe how much I truly appreciate the years of support, love, and encouragement that have seen me through to the completion of my dissertation. Every major accomplishment is more special because of you all. Thank you for being my strength in life and for shaping me into the person that I am today. To my husband, Stephane, thank you for being my biggest source of support during graduate school, and for loving me enough to give me the space I need to shine. To my Uncle Scott, the man who inspired my dissertation topic and who bravely served his community for over 30 years as a firefighter, thank you for your unwavering support and encouragement. There is not a day that goes by that I do not feel privileged and blessed to have you in my life. Finally, I dedicate this dissertation to the person I carry with me in everything that I do: My Zayde, who is my strength, the voice in my head, and my most profound influencer. Though he is no longer with me, he drives every move that I make in my life, and I look upon my accomplishments with immeasurable joy at the thought of how proud he would be if he were still here. I love you Friend, always and forever.

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES	v
ABSTRACT	vi
CHAPTER I: STATEMENT OF THE PROBLEM	1
CHAPTER II: REVIEW OF THE LITERATURE	4
Mental Health of Firefighters: Stress and PTSD.....	4
Mental Health of Firefighters: Depression, Substance Abuse, and Sleep Problems.....	8
Firefighting and Suicide Risk.....	11
Self-Concept and Psychological Functioning	14
Retirement and Mental Health.....	17
Purpose of the Study.....	22
Hypotheses.....	23
CHAPTER III: METHODOLOGY.....	26
Participants	26
Measures	33
Design and Procedures.....	36
Statistical Analyses.....	37
CHAPTER IV: RESULTS	39
Descriptive Data	39
Correlation Analyses.....	43
Moderation Analyses.....	50
Mediation Analyses.....	61
CHAPTER V: DISCUSSION	68
Strengths and Limitations	73
Clinical Implications.....	74
Future Research.....	76
REFERENCES	77

LIST OF TABLES AND FIGURES

Table 1: Demographic profile of the sample - 27

Table 2: Descriptive data for measures and clinical scales - 42

Table 3: Correlations between independent variables and overall psychological functioning - 44

Table 4: Correlations between SCC, MCSDS, and clinical scales - 47

Table 5: Moderation analysis between SCC, financial stability, and psychological functioning - 54

Table 6: Moderation analysis between SCC, types of retirement, and psychological functioning - 57

Table 7: Moderation analysis between SCC, daily pain, and psychological functioning - 60

Table 8: Mediation analysis between SCC, years active, and overall psychological functioning - 63

Table 9: Mediation analysis between SCC, years retired, and overall psychological functioning - 65

Table 10: Mediation analysis between SCC, daily pain, and overall psychological functioning - 67

Figure 1: Proposed conceptual mediation model - 24

Figure 2: Proposed conceptual moderation model - 25

Figure 3: A simple moderation model - 51

Figure 4: A simple moderation model between SCC, financial stability, and overall psychological functioning - 53

Figure 5: A simple moderation model between SCC, types of retirement, and overall psychological functioning - 56

Figure 6: A simple moderation model between SCC, daily pain, and psychological functioning - 59

ABSTRACT

ASSESSMENT OF PSYCHOLOGICAL FUNCTIONING IN RETIRED FIREFIGHTERS

by

Jordana Simone Pepper

The past decade has witnessed a significant increase in clinical attention directed to mental health problems in firefighters. The basis for heightened activity in this area is the convergence of evidence indicating that firefighters demonstrate significantly high levels of psychological disorders such as depression and PTSD (Henderson et al., 2016). A previously unexplored risk factor for psychopathology in firefighters is active retirement. Retirement can lead to a decline in psychological functioning, as well as a decline in a person's self-concept clarity through group loss (Slotter, Winter & Soto, 2015). This loss has the potential to cause, or enhance, feelings of depression, anger, social isolation, and worthlessness. Therefore, it is increasingly important to examine self-concept clarity and its relationship to psychological functioning in retired firefighters to help decrease their risk of developing mental health problems that can lead to diminished functioning, self-harm, or even suicidality. The purpose of this study was to better understand prevalence rates of psychological disorders in retired firefighters, and to determine if significant associations exist between self-concept clarity in retirees and overall psychological functioning. Further analyses explored whether or not self-concept clarity mediated or moderated associations between antecedent variables and psychological functioning such

as length of time in retirement, daily pain level, and length of time served as a career firefighter. It was anticipated that this study would identify significant psychological problems faced by firefighters in retirement, which would ultimately help lead to the creation of both pre-retirement and retirement services focused on enhancing psychological wellbeing for retirees.

Statement of Original Work

I declare the following:

I have read the Code of Student Conduct and Academic Responsibility as described in the *Student Handbook* of Nova Southeastern University. This dissertation represents my original work, except where I have acknowledged the ideas, words, or material of other authors.

Where another author's ideas have been presented in this dissertation, I have acknowledged the author's ideas by citing them in the required style.

Where another author's words have been presented in this dissertation, I have acknowledged the author's words by using appropriate quotation devices and citations in the required style.

I have obtained permission from the author or publisher—in accordance with the required guidelines—to include any copyrighted material (e.g., tables, figures, survey instruments, large portions of text) in this dissertation manuscript.

Jordana Simone Pepper

Name

August 17th, 2020

Date

CHAPTER 1

Statement of the Problem

In almost any emergency, be it a fire, a school shooting, a child drowning, or a car accident, one of the first groups of people on the scene are firefighters. In fact, a firefighter's responsibilities have shifted from primarily dealing with fire suppression to include a broad range of emergency response operations (Jahnke et al., 2016). The present nature of the firefighter profession, namely, repeated exposure to painful and traumatic events, combined with the erratic sleep schedules inherent to shift work, pose a significant risk to firefighters' mental health (Stanley et al., 2017). Despite the fact that firefighters are remarkably resilient, a psychologically protective personality trait, research has shown that many still suffer negative psychological consequences as a result of their stressful, and often traumatic, occupational experiences (Jahnke et al., 2016). Although research on the psychological functioning of firefighters is limited, there is compelling extant evidence suggesting that firefighters experience higher rates of psychological problems, such as mood, stress-related, and substance use disorders, in comparison to the general population (Boxer & Wild, 1993; Del Ben et al., 2006; Jahnke et al., 2016). This is not surprising given the fact that firefighters are repeatedly exposed to high levels of occupational stress and trauma on an almost daily basis. It is important to note, however, that most of the research concerning the psychological functioning of firefighters has been conducted on active duty firefighters. At this time, no research is available examining the psychological functioning of firefighters once they retire from service. Further, no research has explicitly focused on how retirement itself impacts: (1)

the mental health of firefighters, (2) their self-concept, or (3) their risk for suicidality once they are no longer actively employed.

In the general population, unemployment or job loss, including the loss of a job through either voluntary or involuntary retirement, can lead to a decline in mental wellbeing, which can potentially lead to suicidal ideation (Duff & Chan, 2014). Indeed, research has shown that displaced workers are estimated to be twice as likely to die by suicide than actively employed individuals (Duff & Chan, 2014). With what we currently know about the elevated rates of depression, substance abuse, and posttraumatic stress disorder in firefighters (Jahnke et al., 2016), inferences can be made that retirees from this profession are at an even greater risk than their employed counterparts of developing more severe psychopathology including suicidality. Further, the more positively a person's profession is valued by society, the more that person will define him or herself by that profession (Teuscher, 2010). This makes retirement from firefighting a potentially profound disruptor of a firefighter's self-concept, namely a collection of beliefs about oneself (Campbell, 1990), and personal identity.

Research has shown that any disruption in self-concept (which includes strength of personal identity) correlates with higher levels of depression, anxiety, and poor psychological adjustment (Campbell, 1990; Campbell et al., 2003; Pilarska, 2016; Santos et al., 2009; Smith et al., 1996). This loss of identity after retirement further elevates firefighters' risk of developing severe psychological problems, including suicidality, once they are no longer working in the fire force. In fact, between 2005 and 2007 there were four retiree suicides carried out by firefighters retired from the Houston Fire Department, one of the largest fire agencies in the U.S. (Finney et al., 2015). It is unclear how many

more suicides in retirees were unreported from not only Houston, but other U.S. fire houses. These shocking statistics make research on this specific population of firefighters vital in terms of determining the impact retirement has on both the self-concept clarity and psychological functioning of retirees. Furthermore, it is important to identify additional variables that impact a retired firefighter's psychological functioning such as daily pain level and feelings of financial stability. Through a better understanding of a firefighter's psychological functioning and self-concept clarity in retirement, targeted pre-retirement behavioral and mental health interventions can be created to decrease both psychological suffering and suicide risk in this population.

CHAPTER II

Review of the Literature

Mental Health of Firefighters: Stress and PTSD

Firefighters are a subset of professional rescue workers who routinely experience traumatic events over the course of their careers (Lee et al., 2017). Moreover, firefighters often engage in activities that expose them to intense physical and psychological stress in the form of both human suffering and death (Psarros et al., 2018). According to the National Institute of Occupational Safety and Health (2001), firefighting is one of the most dangerous jobs in the world, having one of the highest injury rates of any group of workers. Not only are firefighters at risk of suffering from severe physical trauma, such as bodily injury from burning or collapsing buildings, they are also frequently exposed to psychological trauma such as witnessing death, injury, mass casualties, child drownings, and more (Wagner, McFee, & Martin, 2009). This ongoing contact with personal danger and emotionally distressing events makes firefighters vulnerable to developing psychological problems such as Posttraumatic Stress Disorder (PTSD; Psarros et al., 2018). PTSD is defined as a set of characteristic symptoms following exposure to one or more traumatic events such as actual or threatened death, serious injury, or sexual violence (American Psychiatric Association, 2013). Some of the more common work traumas and extreme stressors that firefighters encounter, and that frequently lead to the development of PTSD and other stress-related disorders, include hearing that children are trapped in a burning building, exposure to unknown toxins and infectious diseases, feeling responsible for other people's lives and deaths, experiencing a lack of support from city government, and feeling overutilized and understaffed (Boxer & Wild, 1993).

Compared to the general population, firefighters experience significantly higher likelihoods of developing PTSD over their lifetimes. Epidemiological research suggests that among firefighters, the prevalence rate of PTSD ranges from 17% to 22% (Straud et al., 2018) compared to the 6.8% lifetime prevalence rate of the disorder in civilians (Gawrych, 2010). A study conducted in Athens, Greece found that one month following a response to devastating wildfires, 18.6% of responding firefighters met full criteria for PTSD (Psarros et al., 2018); significantly higher than the prevalence rate found in civilian populations. While this investigation was not conducted on firefighters in the U.S., it is likely comparable results would be obtained as the nature of the firefighting profession is fairly consistent worldwide.

Corneil et al. (1999) found that the prevalence of self-reported posttraumatic symptomatology in firefighters was 15% to 18% higher than in civilian populations, consistent with findings of similar research examining PTSD in firefighters from the 1990s and early 2000s. More recent research, however, indicates that previous prevalence estimates were overly conservative due to underreporting. There are now indications that PTSD in firefighters occurs at rates as high as 37% (Stanley et al., 2018). It is difficult to get an accurate representation of the scope of PTSD in the fire service due to rate fluctuations across studies. This is primarily because of differences in the types of research participants used (firefighters only versus a mix of firefighters and other emergency responders), wide variations in sample sizes, and inappropriate selection of PTSD measures (Del-Ben et al., 2006). When studies focus solely on firefighters, as opposed to first responders as a whole, and when the sample sizes are reasonably large and measures are used that assess all of the cluster symptoms of PTSD (e.g. the PTSD

Checklist for DSM-5), prevalence rates of PTSD in firefighters have been found to be as high as 37% (Del-Ben et al., 2006).

When examining PTSD in firefighters, it is important to differentiate between the type of traumatic event that led to symptomology, namely, whether PTSD was caused by indirect or direct traumatic events. An example of an indirect traumatic event would be rescuing an injured child or arriving on the scene of a mass school shooting. An example of a direct traumatic event would be a personal injury sustained on duty, such as being physically attacked at the scene of a call. Lee et al. (2017) investigated both direct and indirect traumatic events that firefighters commonly face in the line of duty, and their relationship to the development of posttraumatic stress symptoms (PTSS). Results showed that indirect and colleague-related traumatic events (e.g. a coworker sustaining serious injuries or dying during a call) were significantly associated with PTSS, while direct traumatic events were not. These investigators also found that indirect traumatic events and colleague-related traumas caused the most severe peritraumatic suffering, or suffering occurring around the time of the trauma, such as dissociation or panic (Lee et al., 2017). It was hypothesized that these findings were a result of firefighters being more able to utilize positive coping and problem-solving when it came to their own direct experiences with trauma, as opposed to when they witnessed or learned about severe trauma inflicted upon others, including co-workers. There was significantly higher peritraumatic suffering in cases of indirect traumatic events that subsequently led to more severe posttraumatic stress symptomatology later on (Lee et al., 2017).

With the increased national focus on first responders and PTSD (as evidenced by states, such as Florida, passing legislation allowing for worker's compensation benefits

for first responders suffering from PTSD, even in the absence of any physical injuries), researchers have begun to investigate whether severe reactions to stress and trauma can be prevented. One such study looked specifically at an evidence-based program for the primary prevention of PTSD in firefighters called the Mental Agility and Psychological Strength (MAPS). MAPS was developed following both a consultation with key fire and emergency personnel in Western Australia and a systematic review of PTSD prevention literature. Skeffington et al. (2016) examined 45 career firefighters who were divided between intervention groups and a control group. Pre and post-intervention data were collected. Unfortunately, no evidence was found to suggest that the intervention, which consisted of psychoeducation regarding wellbeing and PTSD, as well as practical skill building such as cognitive restructuring and support seeking, was effective in the primary prevention of mental health issues in firefighters. Further, there was no indication that the approach led to any significant impact on social support or coping strategies (Skeffington et al., 2016). Other researchers have suggested that critical incident stress debriefings might better protect firefighters from stress-related disorders including PTSD (Harris, Baloglu, & Stacks, 2001). However, a study examining the relationship between debriefings and mental health variables (e.g. depression, PTSD, anxiety) in a sample of 852 firefighters found no significant relationship between debriefings and PTSD reduction (Harris et al., 2001).

Although research has yet to provide support for programs aimed at preventing stress-related disorders in firefighters, there is evidence that there are factors that aid in protecting these individuals from developing more severe symptomatology related to PTSD. For example, Stanley et al., (2018) examined the role of perceptions of

belongingness and social support in attenuating PTSD symptom severity in 1,040 firefighters. They found that greater belongingness and social support from family and friends were related to less severe PTSD symptomatology. Interestingly, results also revealed that social support from high ranking supervisors was significantly associated with lower overall PTSD symptom severity. While family and non-firefighter social supports are important in lessening the intensity of psychological responses to traumatic events in firefighters, more significant protection from symptom severity seems to come from support within the fire service.

Mental Health of Firefighters: Depression, Substance Abuse, and Sleep Problems

Although there is a modicum of research regarding psychological disorders in firefighters, there is a burgeoning body of evidence showing that depression, substance abuse, and sleep problems are common in this population (Abbasi et al., 2018; Boxer & Wild, 1993; Carey et al., 2011; Gulliver et al., 2018; Haddock et al., 2012; Stanley et al., 2015). In fact, firefighters often have comorbid psychiatric diagnoses with depression, sleep disturbances, and substance abuse being identified as the most likely disorders to co-occur with PTSD in both male and female firefighters (Carey et al., 2011, Gulliver et al., 2018; Smith et al., 2011; Straud et al., 2018). Research conducted on the psychological functioning of firefighters consistently shows that they experience higher rates of mood and stress-related disorders. The ongoing stress that firefighters encounter in the field most likely accounts for increased vulnerability to mental health conditions, which, in turn, influences their physical functioning, and can lead to a greater likelihood of serious medical conditions such as cardiovascular disease (Angleman, 2011; Eastlake et al., 2015; Plat et al., 2012; Smith et al., 2011; Soteriades et al., 2005).

Perhaps one of the more detrimental effects of the stress and trauma characteristic of the firefighting profession is sleep disturbances that are regularly observed in shift workers. In fact, shift work is one of the main causes of clinical sleep disorders (Abbasi et al., 2018). Literature pertaining to sleep problems in both first responders and civilians highlights the fact that they are often associated with both physical and psychological disorders such as depression, anxiety, substance abuse, and even obesity (Kaipust et al., 2019). Further research suggests that sleep disorders impact firefighters at significantly higher rates than that of civilians. Abbasi et al. (2018) examined sleep in 118 Iranian firefighters and found that 70% suffered from poor quality of sleep with comorbid musculoskeletal pain. A similar study of American firefighters showed that over 60% of 112 respondents suffered from sleep deprivation that caused significant distress (Carey et al., 2011). In the same study, fatigue, decreased alertness, and poor mood scores were widespread, especially among firefighters working night shifts.

Sleep is both restorative and regenerative; without sufficient amounts of sleep a person is at risk for developing symptoms commonly found in mood disorders, decreased mental performance, and increased daytime sleepiness (Carey et al., 2011). These factors have the potential to be dangerous for a firefighter who needs to function at high levels both cognitively and physically in order to perform his/her job satisfactorily. The limited research on sleep in firefighters has shown that poor quality of sleep increases the incidence of occupational accidents due to deficits in attention, cognition, and alertness (Abbasi et al., 2018). It is important to note that unlike overnight shift employees who typically work no more than eight hours at a time, firefighters often find themselves working 12 to 14 hours straight throughout the night (Kaipust et al., 2019). These longer

work hours, specifically during overnight shifts, combined with low sleep quality, are associated with greater on-duty injury in firefighters (Kaipust et al., 2019).

Long work hours and poor sleep quality also combine to increase the likelihood of firefighters suffering from various mood disorders. For example, current research on civilians and first responders highlights the high comorbidity between sleep disturbances and depression (Abbasi et al., 2018; Carey et al., 2011). Prevalence rates of depressive symptomatology in firefighters are substantially higher than what is seen in the general population of the U.S., which are typically less than 10% (Jahnke et al., 2016). As with PTSD, it is hypothesized that depression in firefighters is more pervasive due to persistent exposure to both trauma and high job stress (Kim, Park, & Kim, 2018). Data suggest that 22% of American firefighters meet criteria for clinical depression (Kim et al., 2018).

Firefighters are also likely to suffer from substance abuse problems at higher rates than civilians. Kim et al. (2018) analyzed 7,151 firefighters in a study on substance use in the fire service, and found that 50% of participants endorsed excessive drinking, defined as consuming three or more drinks on one occasion. Haddock et al. (2012) reported that a significant percentage of firefighters, both career and volunteer, engaged in binge drinking. In an examination of substance use in a sample of 1,913 female firefighters, Haddock et al. (2012) found that 39.5% of participants reported frequent episodes of binge drinking. This is well above the percentage of binge drinking reported by women in the general population which ranges from 12-15% (Haddock et al., 2012). Gilliver et al. (2018) evaluated the use of tobacco and alcohol in firefighters during their first three years of service. They found that the association between tobacco use and alcohol use

was strongest when firefighters experienced concurrent depressive symptoms. Similarly, firefighters who suffered from posttraumatic stress symptomatology reported higher alcohol use, with the amount of alcohol consumed being proportional to the severity of PTSD symptoms (Gulliver et al., 2018). Finally, firefighters who screened positive for problematic drinking were 42% more likely to report an occupational injury in the past year (Haddock et al., 2018). These findings continue to highlight the dangers associated with substance use in regard to a firefighter's ability to optimally and safely perform his/her professional duties.

Firefighting and Suicide Risk

Problematic alcohol and substance use, combined with high levels of depression, PTSD, and other psychological disorders, pose another serious risk to firefighters. Suicide is a leading cause of death worldwide in both civilian populations and first responder populations, with over 40,000 individuals dying by suicide each year (Center for Disease Control and Prevention [CDC], 2016). Trauma, depression, anxiety, substance use, and sleep problems all play a role in increasing the risk of suicidality in firefighters, who are more likely to die by suicide due to the nature of the stress and trauma that they are constantly exposed to, combined with poor coping mechanisms such as substance abuse. In fact, the National Fallen Firefighter Foundation reports that fire departments are three times more likely to experience a suicide than a line-of-duty death within a given year (National Fallen Firefighters Foundation, 2014). Furthermore, there is concern that widespread depression, as well as susceptibility to stress and substance abuse, might also increase the risk of suicidal behavior in firefighters (Carey et al., 2011).

Firefighters are more likely to both attempt and die by suicide than civilians. In a white paper commissioned by the Ruderman Family Foundation (2018), they found that there were at least 103 firefighters who died by suicide in 2017. In contrast, 97 firefighters died in the line of duty that same year. The Firefighter Behavioral Health Alliance (FBHA) estimates that only approximately 40% of firefighter suicides are reported, making the actual number of firefighter deaths by suicide in 2017 closer to 257 (Heyman, Dill, & Douglas, 2018). Current models of suicide risk suggest that exposure to painful and traumatic events inherent in firefighting may create conditions under which suicidal behaviors emerge, namely the lowering of one's fear of death and an elevation in one's pain tolerance (Stanley et al., 2015). According to Henderson et al. (2016), there is a growing body of evidence suggesting that firefighters are at an increased risk of attempting or dying by suicide compared with their civilian counterparts due to disturbingly higher rates of PTSD, mood disorders, and substance use disorders. Regarding suicide attempts, it is estimated that 1.9% to 8.7% of the general population have attempted suicide at least once in their lifetime (Nock et al., 2008b). Stanley et al. (2015) examined career prevalence and correlates of suicidal ideation and behaviors among 1,027 career and volunteer firefighters and found that 15.5% endorsed at least one suicide attempt during their career. It is entirely possible that this reported percentage is a conservative estimate of suicidality in firefighters due to a lack of reliable reporting. In the same study, they also found that 46.8% of participants reported experiencing suicidal thoughts since they began firefighting. Of those individuals, 19.2% reported a suicide plan, and 16.4% reported at least one previous suicide attempt.

Hom et al. (2018) conducted a study investigating help-seeking behaviors in women firefighters with a career history of suicidality. In a sample of 119 women, they found that approximately 73% of the firefighters who endorsed suicidality were, in fact, seeking some form of mental health treatment. These results were consistent with prior research on male firefighters who had suicidal thoughts, plans, or previous attempts (Hom et al., 2018). While it is encouraging that more firefighters are seeking help for psychological problems, few of these men and women discuss their suicidal thoughts with mental health providers, or even initiate treatment due to suicidal thoughts. In fact, Hom et al. (2018) found that only 13.4% of females in their study reported seeking services specifically because of their suicidal ideation. It is likely that stigma surrounding suicide in the fire service is preventing firefighters from revealing their ideation to mental health providers. Hom et al., (2018), examined attitudes toward suicide and their relationship to suicide attempts in a sample of 818 firefighters. They found that more stigmatizing attitudes towards suicide were associated with greater self-reported future suicide attempt likelihood. Stigma surrounding suicide in the fire service is not only predictive of future suicide attempts (Hom et al., 2018); it is leaving clinicians unaware of the true reasons why a firefighter is seeking treatment. It is also leaving firefighters vulnerable to act on their ideation without the opportunity for appropriate treatment.

An additional risk factor for suicidal behavior in firefighters is exposure to others' suicide attempts and deaths (Kimbrel et al., 2016). Firefighters are routinely exposed to life-threatening situations. Yet, little research focuses on the impact this exposure has on the firefighters developing their own suicidality post-exposure. In an exploration of the association between exposure to suicide in others as a risk factor for suicidal behavior in

firefighters, Kimbrel et al. (2016) found that rates of suicidality were elevated in firefighters who had prior exposure to other people's suicide attempts and deaths. Specifically, they reported that in firefighters who had witnessed at least one suicide attempt or death, 41% endorsed lifetime suicidal ideation, 11% endorsed suicidal ideation during the past year, 8% endorsed a lifetime suicide plan, and 12% screened positive for being at significant risk for completing suicide. While research on firefighting and suicidality is in the early stages, public awareness on the subject is growing. It is also clear that there is an epidemic within first responder populations that needs to be addressed to prevent fatalities in the future. It warrants attention that all of the aforementioned studies regarding prevalence rates and statistics were conducted on active duty firefighters. However, many of the problems faced by firefighters may be amplified when they are no longer working in the fire service. No studies currently exist assessing the prevalence rates of suicidality in firefighter retirees.

Self-Concept and Psychological Functioning

The clarity of one's self-concept has been widely defined in social psychology as the extent to which the contents of an individual's self-concept are clearly and confidently defined, internally consistent, and temporally stable (Campbell, 1990). Self-concept clarity has also been found to be related to both identity commitment and sense of identity, meaning that how a person truly sees him/herself plays a significant role in their own self-concept clarity (Pilarska, 2016). When self-concept clarity is strong and intact, there is co-occurring high self-esteem and increased life satisfaction and contentment (Suszek et al., 2018). However, a weak clarity of self-concept has been associated with neuroticism, anxiety, and depression (Suszek et al., 2018). Further,

Campbell, Assanand, and Paula (2003) explain that people who are high in self-concept clarity possess numerous specialized identities (e.g. father, executive, husband, friend) that allow them to respond flexibly to a change in their social circumstances leading to different social roles. On the other hand, weak self-concept clarity does not allow for the same flexible response to changes in social roles, such as the social status changes brought about by retirement.

It is important to note that much of the literature on self-concept clarity points to the fact that the greater unity in the structure of a person's self-concept, the more likely they are to have enhanced feelings of psychological wellbeing (Campbell et al., 2003; Campbell, 1990). While the relationship between self-concept clarity and negative affect is in the early stages of exploration, evidence suggests a clear connection between low self-concept clarity and depression (Campbell et al., 2003). It is important to note, however, that this correlation between low self-concept clarity and diminished psychological wellbeing has never been examined in first responder populations. Yet, firefighters are subjected to prolonged exposure to stress. And, the existing literature on self-concept clarity highlights the fact that any type of prolonged exposure to stressful events, or appraisal of stressful events as being unmanageable, can lead to the development of poor self-concept, which is a risk factor for depression (Willis & Burnett Jr., 2016). Recent research also provides evidence that people with low self-concept clarity may be vulnerable to both anxiety and stress-related disorders (Smith, Wethington, & Zhan, 1996).

Examinations of self-concept clarity have also shown that an individual's group affiliations and relationships influence their self-concepts (Slotter et al., 2015). Therefore,

group membership loss has the potential to dramatically reduce self-concept clarity and decrease psychological wellbeing (Slotter et al., 2015). The experience of belonging to a very specific and personal group is central to firefighters who eat, sleep, and work alongside their fellow brothers and sisters several days a week (Stanley et al., 2018). In fact, the concept of brotherhood as social bonding and connection is deeply rooted among firefighters; and brotherhood has been defined by firefighters as “a historical, traditional, and universal idea characterized by inherent dedication, love, respect, and support for one another, living by a code of unspoken duty, trust, honor, and loyalty, and the establishment of members and close relationship, connection, and bonds” (Carey et al., 2011, p. 53).

Having strong group relationships not only provides firefighters with positive self-regard while reducing uncertainty about the self, it also influences and strengthens their self-concept clarity (Slotter et al., 2015). This intrinsic need for firefighters to belong to their affiliated group can have disastrous consequences on both physical and psychological health when the need is not met, for example, when he or she retires and no longer feels connected to his or her former professional environment (Baumeister & Leary, 1995). When that loss of connection is combined with diminished self-concept clarity, a retired firefighter’s psychological wellbeing may further suffer as research demonstrates that low self-concept clarity correlates with negative, passive coping styles, reduced mental wellness, unstable self-views, and increased depression and anxiety (Smith, Wethington & Zhan, 1996).

Self-concept clarity has also been linked in research to suicidal behaviors. While correlation does not equal causation, there is evidence suggesting that a relationship

between low self-concept clarity and suicidality exists (Santos et al., 2009; Wetzel, 1975). Wetzel (1975), reported that lowered self-concept clarity is frequently reported in suicidal individuals, and found that changes in self-rated suicide risk were detectable by change in self-concept clarity. In an examination of suicidal ideation, behavior, and attempts in 100 adolescents, Rutter and Behrendt (2004) found that negative self-concept was one of four factors that were important in determining overall suicide risk. In fact, poor self-concept clarity indicated both self-loathing and a higher likelihood of seriously considering suicide in the cohort of adolescents studied. Lower self-concept clarity has also been positively correlated with a greater likelihood of engaging in parasuicidal and self-harming behaviors, which can often lead to future active suicide attempts (Santos, Saraiva & DeSousa, 2009). In a group of individuals like retired firefighters, who are already vulnerable to disorders that decrease mental wellbeing, such as depression and PTSD, it is important to explore the role that self-concept clarity plays in the relationship between retirement and psychological functioning while also exploring the role it plays in firefighter suicide risk.

Retirement and Mental Health

Retirement is defined as an individual's exit from the workforce, which accompanies decreased psychological commitment to, and behavioral withdrawal from, work (Wang & Shi, 2013). Retirement marks a substantial shift in a person's everyday life and can bring about a change in both a person's self-concept clarity and their identity. Retirement also signifies a symbolic transition to older adulthood that can be psychologically challenging for many people. Indeed, retirement has frequently been conceptualized as a major life crisis (Sharpley & Layton, 1998), with numerous studies

showing that retirees of all ages are more likely to have mental health problems than actively employed persons (Gill et al., 2006; Sharpley & Layton, 1998). Mental health may be particularly sensitive to life changes at retirement, with previous research revealing significant associations between both retirement and greater psychological distress, and retirement and decreased life satisfaction (Olds et al., 2018). According to Lindwall et al. (2017), the act of retirement itself is one that requires coping and adaptation in which psychological health may be profoundly challenged and compromised.

Although there are numerous studies showing clear links between retirement and a decline in psychological functioning, there are also investigations revealing increased psychological wellbeing post-retirement (Gill et al., 2006; Gorry et al., 2018; Latif, 2011). This conflicting evidence is likely due to research with small sample sizes and methodological problems (Latif, 2011). Latif (2011) sought to rectify these methodological shortcomings by examining a large Canadian sample using a longitudinal design to determine the impact of retirement on psychological adjustment. Results showed that retirement had a positive effect on the participants' mental wellbeing. One of the reasons for this finding was a theme that is common in the retirement literature: pre-retirement resources and their moderating effect on retirement and mental wellness. Kubicek et al. (2011) discuss the fact that adjustment to retirement is contingent on available resources, both financial and psychological. The greater the resources, the easier one can adjust to the role of retiree.

While many of these studies offer insights into how retirement affects the psychological functioning of the general population, the nature of a first responder's

career makes it difficult to generalize these results to firefighters. When retirement studies are carried out on civilians, the theoretical framework often used to conceptualize retirement is the Continuity Theory (Latif, 2011). This theory suggests that retirement may not necessarily have negative consequences on psychological wellbeing because individuals occupy multiple roles; and, for most people, the work role may not be their most central. There is, however, a second theoretical framework that more likely applies to firefighters going through retirement. According to Latif (2011) that is the Role Theory perspective of retirement. Role Theory views work and employment to be the primary sources of an individual's self-respect and identity. The act of retirement brings this identity and self-respect to an end which can result in significant psychological upset to the retiree.

Anecdotally, firefighters often describe themselves as firefighters first and everything else second. When they are no longer firefighters, they risk their identity becoming fragmented, their self-concept clarity declining, and they are left susceptible to degeneration of their psychological wellbeing. Further, firefighters are generally viewed favorably by society, and it has been hypothesized that the more positively a person's profession is valued by their communities, the more likely they are to define themselves in terms of their profession (Teuscher, 2010). Firefighters believe that their work is meaningful, and many of them feel that they positively contribute to the communities in which they live (Wagner et al., 2009). Their high job satisfaction is likely due to the belief that they are valued by society as individuals who make a difference in the lives of others (Wagner et al., 2009). This makes it all the more difficult for a retired firefighter who no longer has a loved and valued profession playing an active role in their life.

When that professional piece of a firefighter's identity is taken away, it is possible that many retirees will suffer psychological consequences due to the fact that they are no longer able to view themselves as, what they consider, productive members of society who make a significant difference in people's lives.

Given what we know about the traumatic nature of the fire service, and what research has shown regarding workers experiencing an increase in mental wellness post-retirement, it may seem counterintuitive to suggest that firefighters suffer psychologically post-retirement. After all, it seems logical that an abrupt cessation of exposure to extreme stress and trauma would be psychologically protective for firefighters in retirement, especially since research has shown that active firefighting is a risk factor for a variety of negative physical and mental health problems. However, because we assume that firefighters already suffer from a number of psychological problems ranging from depression to PTSD as they approach retirement, and because retirement both alters their identity and significantly limits their level of social support, one may hypothesize that retirement worsens a firefighter's psychological functioning.

While research on first responder retirement is scarce, some studies have examined the effects of retirement on law enforcement officers. For example, in an evaluation of pre-retirement mental health training for police officers, Sunderland (2014) explained that relinquishment of the badge, uniform, and authority associated with their positions often leads to a substantial loss of personal identity. In a group of individuals like firefighters, who are strongly connected to their profession, this loss of identity can be detrimental to their mental wellbeing. Extant research on police retirement illustrates that retirement does, in fact, intensify many of the psychological issues faced by first

responders through promoting a sense of identity loss (Slotter et al., 2015). In addition, work-family conflicts, often faced by firefighters due to conflict between the demands of their professional and familial roles, likely also contribute to diminished emotional wellbeing post-retirement. An informal interview with a retired firefighter revealed that many firefighters see their work as “a haven” from stressful home environments. Interestingly, they often prefer to rely on fellow firefighters for support as opposed to family, friends, or other members of the non-firefighter community (Coursolle et al., 2010).

According to Sunderland (2014), first responder culture often narrows the world of the firefighter to the point where he or she solely relies on other first responders as sources of social support. Retirement, however, limits access to this support system which can leave them feeling disconnected and abandoned. Strong social support creates an atmosphere of safety and stability that allows individuals to engage in emotional processing of challenges from minor frustrations to traumatic stimuli or events (Farnsworth & Sewell, 2011). However, if firefighters lose their primary social supports in retirement, they may find that their mental wellbeing decreases due to the loss of an environment that previously provided safety and stability in their lives. Indeed, thwarted belongingness likely increases the risk of suicidality in firefighters (Chu et al., 2016). Chu et al. (2016) contend that when the constructs of thwarted belongingness and perceived burdensomeness co-occur, suicidal desires arise and potential for active suicidal ideation emerges. Suicidality and psychopathology in retirees may also be triggered by a shift in a firefighter’s self-concept clarity and group identity, which can

often lead to deleterious consequences on mental health in an already vulnerable group of individuals.

Purpose of the study

Despite the current knowledge regarding the challenges faced by active first responders in terms of their mental health and psychological functioning, and despite what we know about the effects of retirement on mental health in civilian populations, little is known about the psychological functioning of firefighters once they are actively retired from the fire force. Beyond a limited number of studies on retirement in police officers, no investigations have been conducted to ascertain the impact of retirement on firefighters, or to highlight the psychological issues faced by actively retired firefighters. Further, while research on the relationship between self-concept clarity and psychological functioning is robust and informative, no studies to date have examined the role self-concept clarity plays in the psychological functioning of retired firefighters. The current study attempted to expand the literature regarding the psychological functioning of retired firefighters and sought to determine whether or not a significant relationship exists between self-concept clarity and overall psychological functioning in retirees. Additionally, the study investigated whether self-concept clarity moderated and/or mediated the relationships between psychological wellbeing and other predetermined personal factors such as the number of years spent as a career firefighter, the number of years actively retired, access to adequate, affordable health insurance, and daily levels of physical pain.

In essence, the tripartite purpose of this investigation was to; (a) determine prevalence rates of psychological disorders in retired firefighters and to see which

personal variables significantly related to increased or decreased psychological functioning in these retirees; (b) ascertain whether a significant relationship between self-concept clarity and psychological functioning existed, and evaluate whether or not self-concept clarity mediated or moderated the relationship between psychological functioning and variables such as length of time in full-time retirement, levels of daily pain, or feelings of financial stability; and (c) provide heuristic avenues of future research to address the needs of retired firefighters and other retired first responders.

Hypotheses

1. Retired firefighters will demonstrate poor psychological functioning, as shown by clinically significant score elevations ($s > .90$) on measures of depression, panic, psychosis, substance use, suicidal ideation, violence, mania, sleep problems, social conflict, work functioning, sexual functioning, quality of life, and PTSD ($s \geq 33$).
2. Retired firefighters will score in the “low” range on a measure of self-concept clarity ($s \leq 46$).
3. There will be a significant association between scores on each of the psychological functioning scales and the overall score of self-concept clarity.
4. Type of retirement, feelings of financial stability, and daily pain will significantly relate to the overall psychological functioning of retired firefighters and will be moderated by self-concept clarity.
5. Daily pain, number of years retired, and number of years in active service will have a significant indirect effect on the overall psychological functioning of retired firefighters, which will be mediated by self-concept clarity.

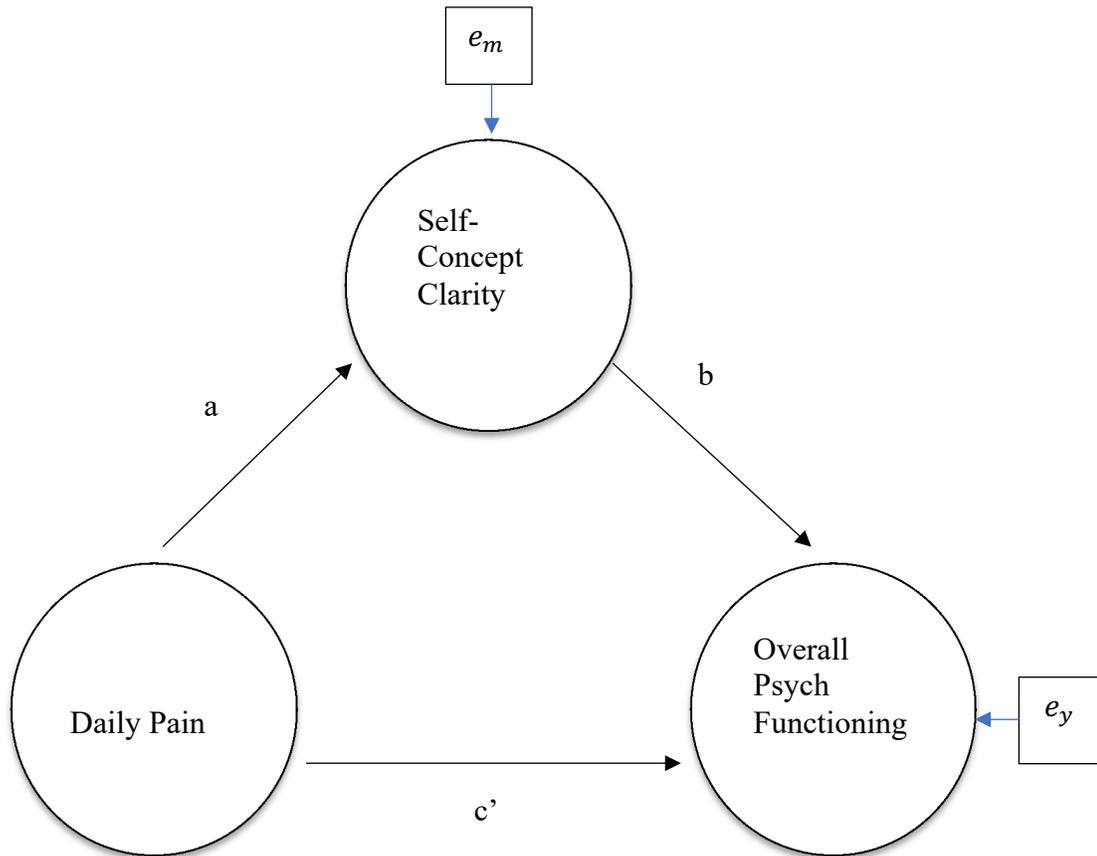


Figure 1. A proposed conceptual model where self-concept clarity mediates the relationship between daily pain and overall psychological functioning in retired firefighters

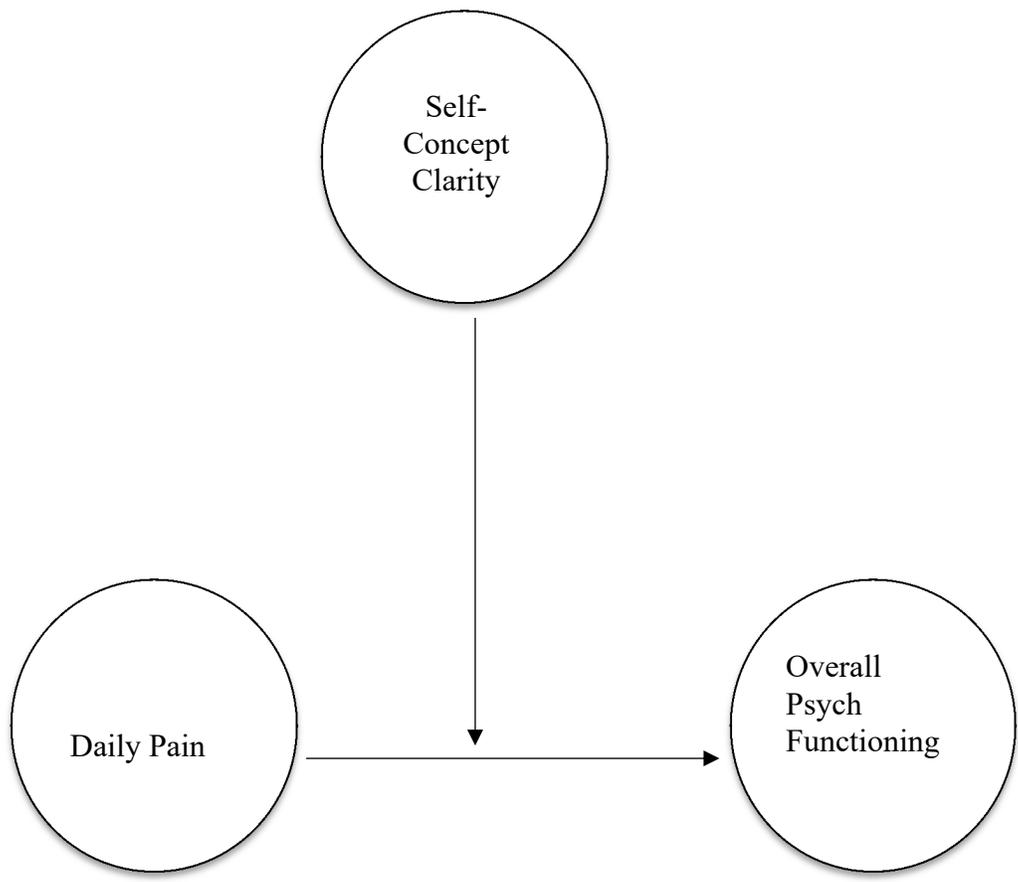


Figure 2. A proposed conceptual model where self-concept clarity moderates the relationship between daily pain and overall psychological functioning in retired firefighters

CHAPTER III

Methodology

Participants

The present study included 315 participants who were recruited through both social media and email. Inclusion criteria consisted of being a former career firefighter and being actively retired from the fire force. According to Data USA (<https://datausa.io/profile/soc/firefighters>), in 2018 males made up 95.8% of the fire force, and 83.5% of all United States firefighters were Caucasian. Similarly, demographic breakdowns of the current sample showed that the majority of participants were both male (87.9%) and Caucasian (93.6%). The age of participants ranged from 39 to 81 ($M = 63.20$, $SD = 7.26$), with the majority of respondents' ages being between 61 and 70 (50.6%). Participants' number of years in service ranged from 6 to 48 years ($M = 30.56$, $SD = 6.25$), with the highest percentage of participants serving 31 to 40 years (46.0%). Number of years participants have been retired ranged from 1 month to 35 years ($M = 10.04$, $SD = 7.02$), with the highest percentage of participants being retired for 0 to 10 years (34.9%). Regarding type of retirement, 78.4% of participants voluntarily retired from the fire force, while 21.6% of participants were either forced into retirement for medical or other reasons unspecified. Approximately 96% of participants identified as heterosexual, and 76.8% of respondents endorsed being married. Combined family income ranged from \$10,000 per year to over \$200,000 per year, with 46.7% of respondents reporting a combined family income of \$100,000 – \$200,000 per year. The highest rank of each participant ranged from Firefighter/Paramedic to Fire Chief. Demographic characteristics of the sample are presented in Table 1.

Table 1

Demographic Profile of the Sample

Variable	N	Percentage
<u>Gender</u>		
Male	277	87.9
Female	37	11.7
Other	1	0.3
<u>Ethnicity</u>		
Caucasian/White	294	93.6
Asian	1	0.3
African American/Black	1	0.3
Hispanic/Latino	8	2.5
East Indian	1	0.3
Other	9	2.8
<u>Religion</u>		
Catholic	89	28.3
Jewish	7	2.2
Protestant	56	17.8
Other Christian	76	24.1
No Religion	67	21.3
Other	20	6.3
<u>Age</u>		

39 – 50	9	2.8
51 – 60	97	31.4
61 – 70	157	50.6
71+	47	15.2

Living Situation

Living Alone	43	13.7
Living with Children	18	5.7
Living with Other Relatives	5	1.6
Living with Parent(s)	1	0.3
Living with Partner	241	76.8
Other	6	1.9
Missing	1	0.3

Highest Degree

High School	53	16.8
Business/Trade School	35	11.1
Two-year College	128	40.6
Four-year College	70	22.2
Masters	20	6.3
Doctorate	3	1.0
Other	6	1.9

Employment Status

Full Time	22	7.0
-----------	----	-----

Part Time	34	10.8
Retired	256	81.3
Unemployed/Not Looking	1	0.3
Working not for Money (Homemaker)	2	0.6

Rank

Firefighter/Paramedic	46	14.6
Driver Engineer	53	16.8
Lieutenant	39	12.4
Captain	88	27.9
Battalion Chief	46	14.6
Assistant Chief	12	3.8
Fire Chief	14	4.4
Other	17	5.4

Years of Active Duty

0 – 10	3	0.9
11 – 20	19	5.9
21 – 30	134	42.5
31 – 40	145	46.0
41 – 50	13	4.0
Missing	1	0.3

Years Retired

0 – 5	110	34.9
6 – 10	62	19.7

11 – 15	76	24.2
16 – 20	44	14.0
21 – 25	12	3.9
26 – 30	5	1.6
31 – 35	4	1.2
Missing	2	.6

Type of Retirement

Voluntary Retirement	247	78.4
Forced Medical Retirement	53	16.8
Forced Retirement for another Reason	15	4.8

Military Service

Yes	81	25.7
No	234	74.3

Sexual Orientation

Heterosexual	303	96.5
Gay/Lesbian	3	1.0
Bisexual	4	1.3
Other	1	0.3
Decline to Answer	3	1.0
Missing	1	0.3

Marital Status

Single	22	7.0
Married	242	77.1

Divorced	36	11.5
Widowed	10	3.2
Separated	4	1.3
Missing	1	0.3

Number of Marriages

Zero	12	3.8
One	175	55.7
Two	82	26.1
Three	32	10.2
More than Three	13	4.0
Missing	1	0.3

Number of Children

Zero	40	12.7
One	39	12.4
Two	109	34.6
Three	60	19.0
Four	37	11.7
Five	18	5.7
More than Five	7	2.2
Missing	5	1.0

Income Bracket

None – 10k	1	0.3
10 – 20k	1	0.3

20 – 30k	1	0.3
30 – 40k	2	0.6
40 – 50k	10	3.2
50 – 75k	45	14.3
75 – 100k	60	19.0
100 – 200k	147	46.7
Over 200k	41	13.0
Missing	7	2.2

**Some percentages may not add to 100 due to rounding

**Total N values varied due to missing responses

Measures

A **Demographics Form** was used to gather information on 16 different categories: sex, age, rank, number of years spent in active service, number of years spent in active retirement, whether retirement was forced or voluntary, previous military service, current marital status, total number of marriages, total number of children, daily physical pain scale, religion, salary bracket, feelings of financial stability, medical illnesses, and access to adequate health insurance.

The **PTSD Checklist for DSM-5 (PCL-5)** (Blevins et al., 2015) is a 20-item self-report measure that assesses the 20 symptoms of PTSD. This instrument was designed to screen individuals for PTSD and is often used with veterans and military personnel. Items are rated from 0 to 4 (0 = not at all; 4 = extremely) and are summed for a Total Severity score. Psychometric evaluations of the PCL-5 have found the measure to have high internal consistency in samples of both veterans and civilians ($\alpha = .95$; Wortmann et al., 2016). Further, the PCL-5 showed a high degree of agreement in identifying PTSD cases in a sample of U.S. Army soldiers (Wortmann et al., 2016). Wortmann et al. (2016) also found strong convergent validity between the PCL-5 and the clinician-administered measure of PTSD. The assessment asks each respondent to indicate how much they have been bothered by specific problems in the past month. Sample problems include: “Repeated, disturbing dreams of the stressful experience”, “Loss of interest in activities that I used to enjoy”, and “Irritable behavior, angry outbursts, or acting aggressively”.

The **Treatment Outcome Package** (TOP; Kraus, Seligman, & Jordan, 2005) is a multidimensional routine progress and outcome measure that was designed in 2005 by Behavior Health Laboratories and is primarily used to track behavioral health treatment

progress outcomes (Boswell & Kraus, 2015). The measure has been used to assess more than 600,000 clients in the past 12 years (Kraus & Castonguay, 2012). Each of the 58 items that comprise the TOP load onto 12 scales measuring a broad range of issues and symptomatology: depression, panic, psychosis, substance use, suicidal ideation, violence, mania, sleep, social conflict, work functioning, sexual functioning, and quality of life. Because of the wide range of areas measured by the TOP, it is a useful instrument to determine baseline levels of psychopathology in research participants (Youn, Kraus & Castonguay, 2012). Also, it is often utilized to promote patient-centered care and program evaluation (Boswell & Kraus, 2015). Kraus et al. (2005) reported that the measure has an excellent factor structure, promising initial convergent and discriminant validity, and measures a full range of pathology on each scale. Convergent validity was determined by comparing the TOP to measures such as the Beck Depression Inventory (BDI), The Brief Symptom Severity Inventory (BSI), The Minnesota Multiphasic Personality Inventory-2 (MMPI-2), the BASIS 32, and the SF-36. Correlations were as high as .92 with the BDI, -.90 with the BSI, -.84 with the Basis 32, and -.73 with the MMPI (Kraus et al., 2005). All reliabilities for subscales were good ranging from .87 to .94 (Youn et al., 2012). Expert clinical and client review in the development process also ensured adequate face validity (Kraus et al., 2005).

The **Self-Concept Clarity Scale** (Campbell et al., 1996) is a 12-item self-report assessment that measures the strength of a person's self-concept clarity. Validation studies show that it has an average alpha reliability coefficient of .86, and that each of the 12 items yields strong evidence of a single, general factor (Campbell et al., 1996). Test-retest studies also showed high levels of temporal stability with test-retest correlations of

.79 and .70 respectively (Campbell et al., 1996). Finally, the self-concept clarity scale was highly correlated with measures of self-esteem ($r = .61$), significantly negatively correlated with measures of neuroticism ($r = -.64$) and demonstrated a strong inverse correlation with measures of rumination ($r = -.52$), thus showing high convergent validity (Campbell et al., 1996). Sample items include, “My beliefs about myself often conflict with one another,” and “Sometimes I feel that I am not really the person that I appear to be.” Scores range from 1 (*strongly disagree*) to 5 (*strongly agree*).

The **Marlowe-Crowne Social Desirability Scale** (Crowne & Marlowe, 1960) is a 33-item self-report measure that is widely used to assess and control for response bias in self-report research (Barger, 2002). Research has shown that the long form of the measure has sound psychometric properties including adequate internal reliability ($\alpha = .88$), and a strong test-retest coefficient ($r = 0.89$; Barger, 2002). According to Barger (2002), convergent and discriminant validity for the Marlowe-Crowne Social Desirability Scale was evaluated against the MMPI clinical and validity scales. Because the measure correlated less strongly with the clinical scales, and more strongly with the validity scales, there was success in creating a measure free from psychopathological content. Validation data include correlations of .40 with the MMPI Correction scale and .54 with the MMPI Lie scale (Crowne & Marlowe, 1960). Crowne and Marlowe (1960) also reported a Kuder-Richardson internal consistency coefficient of .88, and a test-retest reliability of .89. Respondents indicate whether a statement is true or false and are then given a score of either 0 or 1 based on that response.

Design and Procedures

This study was observational with a cross-sectional design, meaning that the study took place at a single point in time, did not involve the manipulation of variables, and allowed the researcher to examine numerous characteristics at once (Kazdin, 1998). Participants were recruited for this study through email and social media. Criteria for participation included being fully retired from the fire force and being a previous career firefighter. Retired volunteer firefighters and active duty firefighters were excluded from this study. There were no gender or geographic restrictions for participation within the United States. International firefighters were not included in this study.

The study was approved by Nova Southeastern University's Institutional Review Board (IRB) on February 18th, 2020 (45 CFR 46.101(b) Exempt). Five measures were used to gather data pertaining to demographic information, psychological functioning, PTSD symptomology, self-concept clarity, and bias in self-report. The chosen measures were selected for this study due to their brevity and sound psychometric properties. Each measure was converted into an online survey through Qualtrics, and the survey link was shared with potential participants through social media and email. The study guaranteed each participant anonymity, and no information was collected that could identify or be traced back to any respondent. Potential participants were informed of the general purpose of the present study, the expected duration of participation, the voluntary nature of participation, the anonymous and confidential nature of the study, and were informed that refusal to participate, or discontinuation at any time, would result in no penalty to the participant. 315 surveys were completed and downloaded from the Qualtrics survey hosting site, scored, and entered into a corresponding data set.

Statistical Analyses

Data analyses consisted of three statistical methods: (1) Correlation analyses were used to evaluate the strength of an association between two quantitative variables; (2) moderation analyses were used to evaluate whether a third variable, or “moderator variable”, affected the strength of an association between a dependent and independent variable; and (3) mediation analyses were used to facilitate a better understanding of the association between a dependent and independent variable. All analyses were conducted using IBM’S statistical software SPSS version 26 (IBM Corps, 2013). The macro PROCESS (Hayes, 2013) in SPSS (IBM Corp, 2013) was utilized to evaluate direct and indirect effects, and conditional effects, across variables of interest. Using a regression-based approach, PROCESS (Hayes, 2013) evaluated these effects in models that included both moderating and mediating variables.

A moderation model seeks to determine whether or not a specific variable influences the size of one variable’s effect on another (Hayes, 2017). Essentially, the effect of X on some variable Y is moderated by W if its size, sign, or strength depends on, or can be predicted by, W (Hayes, 2017). A mediation model, on the other hand, is a statistical method used to test hypotheses about how some causal antecedent variable X transmits its effect on a consequent variable Y (Hayes, 2017). In essence, a simple mediation model is any causal system in which at least one causal antecedent X variable is proposed as influencing an outcome Y though a single intervening variable M (Hayes, 2017). All effects were evaluated at a significance level of $\alpha = .05$, and two decimal points were reported unless more decimal points were needed to show the first non-zero integer (American Psychological Association, 2010).

To test hypotheses one and two, scores on both the TOP and Self-Concept Clarity Scale were analyzed to determine which participants had clinically significant score elevations. The results were then used to create an overview of prevalence rates among retired firefighters. To test hypothesis three, correlations were calculated between Self-Concept Clarity scores and scores on each of the 12 TOP clinical scales to determine whether or not significant associations existed. To test hypothesis four, moderation analyses were conducted to determine whether or not self-concept clarity significantly interacted with type of retirement, feelings of financial stability, and severity of daily pain to influence overall psychological functioning. Finally, to test hypothesis five, mediation analyses were conducted to examine the indirect effects of severity of daily pain, number of years retired, and number of years on active duty on psychological functioning through self-concept clarity.

CHAPTER IV

Results

Descriptive Data

The sample used in this study consisted of retired career firefighters (N = 315). Approximately 88% of participants were male, while 11.7% identified as female, and .3% identified as “other”. The ages of participants ranged from 39 to 81 with the mean age being 63.2 years (SD = 7.26). The number of years each firefighter served on active duty ranged from six to 48 years with the mean amount of time served being 30.6 years (SD = 6.25). The length of time each participant has been actively retired ranged from one month to 35 years, with the mean amount of time being 10 years (SD = 7.02). Rank breakdowns were as follows: 14.6% of participants retired as firefighters/paramedics, while 16.8% retired as driver/engineers, 12.4% retired as lieutenants, 27.9% retired as captains, 14.6% retired as battalion chiefs, 3.8% retired as assistant chiefs, 4.4% retired as fire chiefs, and the remaining 5.4% retired with “other” ranks such as fire marshal. The majority of participants (78.4%) voluntarily retired from the fire force, while 16.8% were forced into retirement for medical reasons, and the remaining 4.8% were forced into retirement for “another reason” not specified. Approximately 26% of participants had previous military service. Refer to Table 1 for demographic breakdowns of the entire sample.

Each participant was asked to complete a battery of assessments to evaluate their psychological functioning on various scales such as depression, anxiety, PTSD, suicidality, and overall life quality. Their level of social desirability was also measured to ascertain potential response bias in self-report. Finally, each participant was measured on

the strength of their self-concept clarity. Descriptive data for each assessment scale and measure is presented in Table 2. A majority of participants (61.7%) scored between 20 and 33 on a measure of social desirability indicating that many retired firefighters are highly concerned about social approval. This suggests that the obtained and reported scores are likely an underestimation of the true nature of psychological functioning in retired firefighters. Similarly of note, almost half of all respondents (48.9%) scored in the low range on a measure of Self-Concept Clarity ($S \leq 46$) suggesting a weak sense of personal identity.

When interpreting each clinical scale, with the exception of PTSD, scores were divided into four categories. Scores ranging from $.90 \leq x \leq 1.50$ indicated a “questionable” score meaning that the respondent likely suffers from clinically significant issues related to the specific clinical scale. Scores ranging from $1.51 \leq x \leq 1.99$ indicated that the respondent was suffering from mildly significant issues related to the specific clinical scale. Scores ranging from $2.00 \leq x \leq 2.99$ indicated that the respondent was suffering from moderately significant issues related to the specific clinical scale. Finally, scores above 3.00 indicated that the respondent was suffering from extremely significant issues related to the specific clinical scale. This scoring and interpretation system was developed and implemented by the test creators specifically for use with the TOP assessment (Kraus, Seligman, & Jordan, 2005).

Breakdown of score elevations on the TOP clinical scales were as follows: 21.9% of respondents had clinically significant elevations on the depression scale; 23.5% of respondents had clinically significant elevations on the life satisfaction scale; 16.2% of respondents had clinically significant elevations on the mania scale; 16.3% of

respondents had clinically significant elevations on the anxiety scale, which encompasses panic; 21.6% of respondents had clinically significant elevations on the psychosis scale which captures symptoms related to impaired reality testing including both psychosis and PTSD such as nightmares and hypervigilance; 11.1% of participants met full criteria for a diagnosis of PTSD; 27.3% of respondents had clinically significant elevations on the substance abuse scale; 17.1% of respondents had clinically significant elevations on the social functioning scale; 21.5% of respondents had clinically significant elevations on the sexual functioning scale; 37.8% of respondents had clinically significant elevations on the sleep scale; 11.4% of respondents had clinically significant elevations on the suicide scale; 8.6% of respondents had clinically significant elevations on the violence scale; and 5.1% of respondents had clinically significant elevations on the work functioning scale.

Table 2

Descriptive Data for Measures and Clinical Scales

Measure/Scale	N	M	SD	Min	Max
Depression	315	0.19	1.29	-1.04	5.12
Life Satisfaction	315	-0.01	1.31	-1.59	3.96
Mania	315	-0.06	0.87	-1.19	2.30
Anxiety	313	0.08	1.03	-0.62	6.48
Psychosis	315	0.26	1.23	-0.65	7.96
Substance Abuse	315	0.83	2.35	-0.34	14.42
Social Functioning	315	-0.14	1.20	-1.15	4.66
Sexual Functioning	312	0.17	1.15	-0.80	4.29
Sleep	315	.69	1.42	-1.06	4.63
Suicide	315	.22	1.10	-0.20	8.85
Violence	315	-0.02	.95	-2.80	6.46
Work Functioning	314	-0.75	.75	-1.12	3.77
Overall Psychological Functioning	315	1.46	9.34	-10.04	44.24
Self-Concept Clarity	315	46.27	9.60	15	60
Marlowe-Crowne	313	20.66	5.64	3	32
PTSD	315	12.61	14.13	0	66

**N values varied due to missing responses

Correlation Analyses

Correlation analyses were used to examine associations between overall psychological functioning (measured by adding up the scores of each TOP clinical scale) and 12 preselected variables: age, length of time on active duty, length of time retired, type of retirement (voluntary or forced), military service, marital status, number of marriages, income bracket, feelings of financial stability, daily pain scale, access to adequate/comprehensive/affordable health insurance, and highest degree obtained. Results indicated that age ($r(308) = -.30, p < .001$), length of time on active duty ($r(312) = -.13, p = .02$), and length of time retired ($r(311) = -.16, p < .01$) each had statistically significant negative correlations with overall psychological functioning. In other words, the higher the age, the longer length of time served on active duty, and the longer a participant was retired was significantly related to a lower overall psychological functioning score indicating better overall psychological functioning. Daily pain was positively correlated to overall psychological functioning ($r(313) = .36, p < .001$), meaning that the more pain a participant experiences on a daily basis the higher their score of overall psychological functioning indicating worse psychological functioning. Finally, feelings of financial stability ($r(313) = .34, p < .001$), type of retirement ($r(313) = .21, p < .001$), and access to adequate/comprehensive health insurance ($r(313) = .35, p < .001$) all significantly correlated with overall psychological functioning. All correlations are presented in table 3.

Table 3

Correlations between 12 independent variables and overall psychological functioning

		Overall Psychological Functioning
Overall Psychological Functioning	Pearson Correlation	1
	Sig. (2-tailed)	
	N	315
Age	Pearson Correlation	-.304**
	Sig. (2-tailed)	.000
	N	310
Active Years	Pearson Correlation	-.128*
	Sig. (2-tailed)	.023
	N	314
Retired Years	Pearson Correlation	-.160**
	Sig. (2-tailed)	.004
	N	313
Type of Retirement	Pearson Correlation	.207**
	Sig. (2-tailed)	.000
	N	315
Military	Pearson Correlation	.058
	Sig. (2-tailed)	.305
	N	315
Marital Status	Pearson Correlation	.105
	Sig. (2-tailed)	.063

	N	314
Number of Marriages	Pearson Correlation	-.049
	Sig. (2-tailed)	.385
	N	314
Income Bracket	Pearson Correlation	-.088
	Sig. (2-tailed)	.124
	N	308
Feelings of Financial Stability	Pearson Correlation	.337**
	Sig. (2-tailed)	.000
	N	315
Pain Scale	Pearson Correlation	.364**
	Sig. (2-tailed)	.000
	N	315
Adequate Health Insurance	Pearson Correlation	.348**
	Sig. (2-tailed)	.000
	N	315
Highest Degree Earned	Pearson Correlation	.051
	Sig. (2-tailed)	.363
	N	315

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Additional correlation analyses were conducted to determine whether a significant association exists between participants' scores on a measure of Self-Concept Clarity and their scores on each clinical scale, and to determine whether a significant association exists between scores on the Marlowe-Crowne Social Desirability Scale (MCSDS) and each clinical scale. Results indicated that Self-Concept Clarity had significant negative correlations with each clinical scale except for mania (see Table 4), meaning that the lower the participant's score on Self-Concept Clarity the higher the score on all but one clinical scale indicating worse overall psychological functioning. Results of the correlation analysis between the Marlowe-Crowne and each clinical scale showed that there were significant negative correlations between the MCSDS and each of the clinical scales, meaning that the higher the MCSDS score the lower the score on each clinical scale suggesting better psychological functioning (see Table 4). This was taken into account when interpreting all results, as elevated scores on the MCSDS point to participants who are highly concerned with appearing socially desirable through their self-report responses. The scope of this study did not include controlling for social bias. The correlations between Self-Concept Clarity, MCSDS, and each clinical scale are presented in Table 4.

Table 4

Correlations between SCC, MCSDS, and clinical scales

		Self-Concept Clarity	Marlowe- Crowne
Self-Concept Clarity	Pearson Correlation	1	.396**
	Sig. (2-tailed)		.000
	N	315	313
Marlowe-Crowne	Pearson Correlation	.396**	1
	Sig. (2-tailed)	.000	
	N	313	313
Depression Scale (TOP)	Pearson Correlation	-.644**	-.472**
	Sig. (2-tailed)	.000	.000
	N	315	313
Life Satisfaction Scale (TOP)	Pearson Correlation	-.531**	-.338**
	Sig. (2-tailed)	.000	.000
	N	315	313
Mania Scale (TOP)	Pearson Correlation	-.054	-.134*
	Sig. (2-tailed)	.342	.018
	N	315	313
Anxiety Scale (TOP)	Pearson Correlation	-.307**	-.227**
	Sig. (2-tailed)	.000	.000
	N	313	311
Psychosis Scale (TOP)	Pearson Correlation	-.437**	-.290**
	Sig. (2-tailed)	.000	.000

	N	315	313
Substance Abuse Scale (TOP)	Pearson Correlation	-.326**	-.320**
	Sig. (2-tailed)	.000	.000
	N	315	313
Social Functioning Scale (TOP)	Pearson Correlation	-.488**	-.436**
	Sig. (2-tailed)	.000	.000
	N	315	313
Sexual Functioning Scale (TOP)	Pearson Correlation	-.377**	-.305**
	Sig. (2-tailed)	.000	.000
	N	312	310
Sleep Scale (TOP)	Pearson Correlation	-.399**	-.273**
	Sig. (2-tailed)	.000	.000
	N	315	313
Suicide Scale (TOP)	Pearson Correlation	-.446**	-.223**
	Sig. (2-tailed)	.000	.000
	N	315	313
Violence Scale (TOP)	Pearson Correlation	-.226**	-.224**
	Sig. (2-tailed)	.000	.000
	N	315	313
Work Functioning Scale (TOP)	Pearson Correlation	-.310**	-.246**
	Sig. (2-tailed)	.000	.000
	N	314	312
Overall Psychological Functioning	Pearson Correlation	-.612**	-.472**

	Sig. (2-tailed)	.000	.000
	N	315	313
<hr/>			
PTSD (PCL-5)	Pearson Correlation	-.669**	-.413**
	Sig. (2-tailed)	.000	.000
	N	315	313

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Moderation Analyses

Moderation analyses, using the macro PROCESS 2.15 (Hayes, 2013), were conducted to test the hypothesis that self-concept clarity moderates the association between feelings of financial stability and overall psychological functioning, type of retirement and overall psychological functioning, and daily pain and overall psychological functioning. Type 1 error was set at the .05 level. The statistical model constructed to address this hypothesis is defined as follows:

$$Y = i_1 + (b_1 + b_3M)X + b_2M + e_y$$

Where i_1 is the intercept, b_1 is the regression coefficient for X (feelings of financial security, type of retirement, daily pain scale), b_2 is the regression coefficient for M (self-concept clarity), b_3 is the regression coefficient for the product of X and M, and e_y equals standard error. The regression coefficients estimate the effect of X when $M = 0$ and the effect of M when $X = 0$ respectively (Hayes, 2013). See Figure 3.

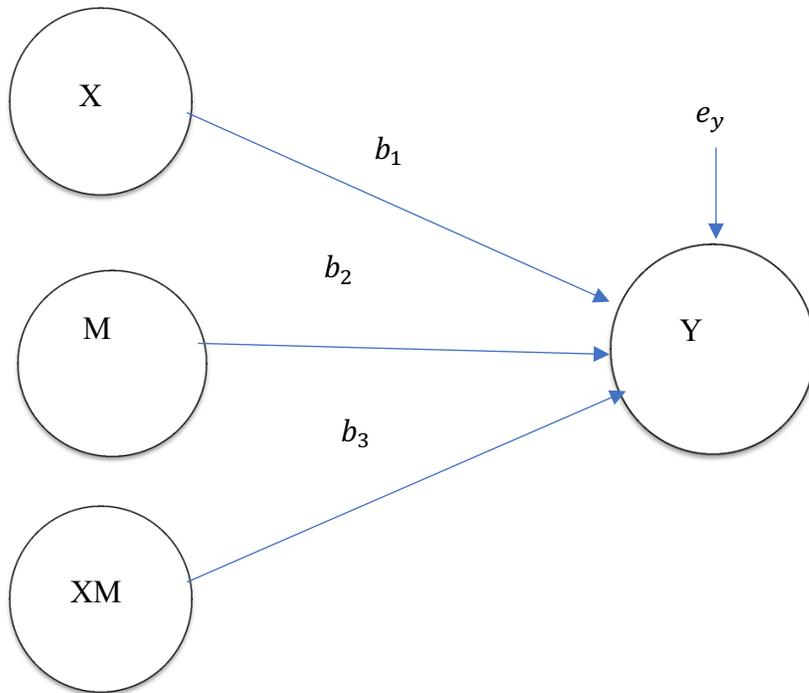


Figure 3: A simple moderation model depicted as a statistical diagram

Results of the first analysis to determine whether or not self-concept clarity moderates the association between feelings of financial stability and overall psychological functioning showed that b_1 is positive ($b_1 = 9.61$) meaning that those who endorsed a higher value on feelings of financial stability (indicating feelings of financial instability) were estimated to have worse overall psychological functioning as evidenced by higher values on their scores of overall psychological functioning. When the moderating variable, self-concept clarity, was added into the regression analyses, results showed that the interaction between self-concept clarity and feelings of financial stability was statistically significant ($F(1, 300) = 4.78, \beta = -.19, p = .03$). This confirms that self-concept clarity moderates the association between feelings of financial stability and overall psychological functioning such that at lower values of SCC, a stronger and more significant association exists between feelings of financial stability and overall psychological functioning. In contrast, at higher values of SCC, a weaker and less significant association exists between the two variables. See figure 4 and table 5.

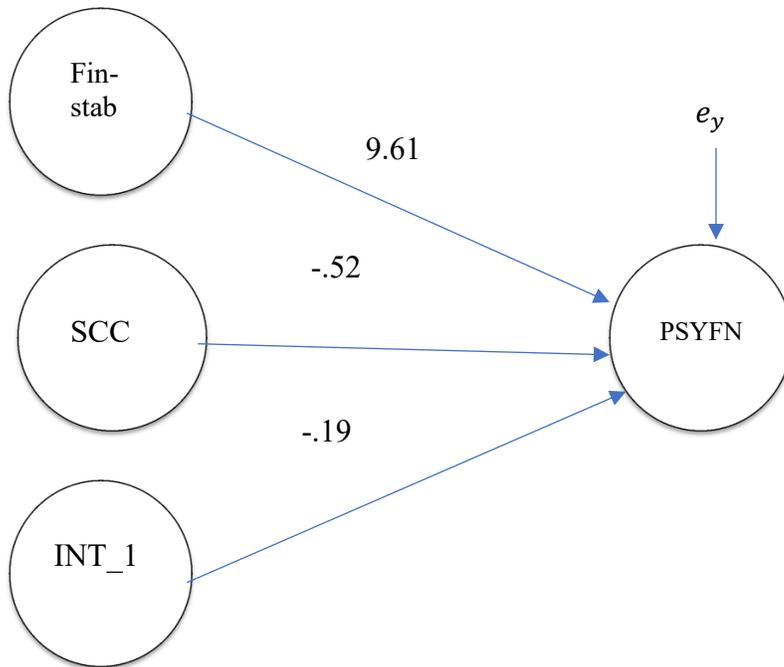


Figure 4: A simple moderation model evaluating whether or not SCC moderates the association between feelings of financial stability and overall psychological functioning

Table 5

Self-Concept Clarity as a Moderator between Psychological Functioning and Financial Stability

	Coeff	se	t	p	LLCI	ULCI
Constant	25.2005	2.2127	11.3892	.000	20.8462	29.5549
Financial Stability	9.6092	3.2433	2.9628	.0033	3.2267	15.9918
Self-Concept Clarity	-.5247	.0460	-11.4019	.0000	-.6153	-.4341
Int_1	-.1861	.0851	-2.1872	.0295	-.3536	-.0187

Product term key:

Int_1: Financial Stability x Self-Concept Clarity

Test(s) of higher order unconditional interactions:

	R2-chng	F	df1	df2	p
X*W	.0093	4.7840	1.0000	300.0000	.0295

Conditional effects of the focal predictor at values of the moderator(s):

SCC	Effect	se	t	p	LLCI	ULCI
36.6826	2.7375	.8524	3.2114	.0015	1.0600	4.4150
46.2730	.9591	1.1865	.8084	.4195	-1.3758	3.2941
56.8634	-.8192	1.8469	-.4435	.6577	-4.4538	2.8154

**Level of confidence for all confidence intervals in output = 95.00

**W values in conditional tables are the mean and +/- SD from the mean

Similarly, results of the second analysis to determine whether self-concept clarity moderates the association between type of retirement and overall psychological functioning found that at higher values of X (indicating forced retirement of some kind), participants scored higher on overall psychological functioning suggesting worse overall functioning ($b_1 = 13.98$). When the moderating variable, self-concept clarity, was added into the regression analysis, results showed that the interaction between self-concept clarity and type of retirement was statistically significant ($F(1, 311) = 7.46, \beta = -.26, p = .01$). This confirms that self-concept clarity moderates the association between type of retirement and overall psychological functioning such that at lower values of SCC, a stronger and more significant association exists between the type of retirement and overall psychological functioning. In contrast, at higher values of SCC, a weaker and less significant association exists between the two variables. See figure 5 and table 6.

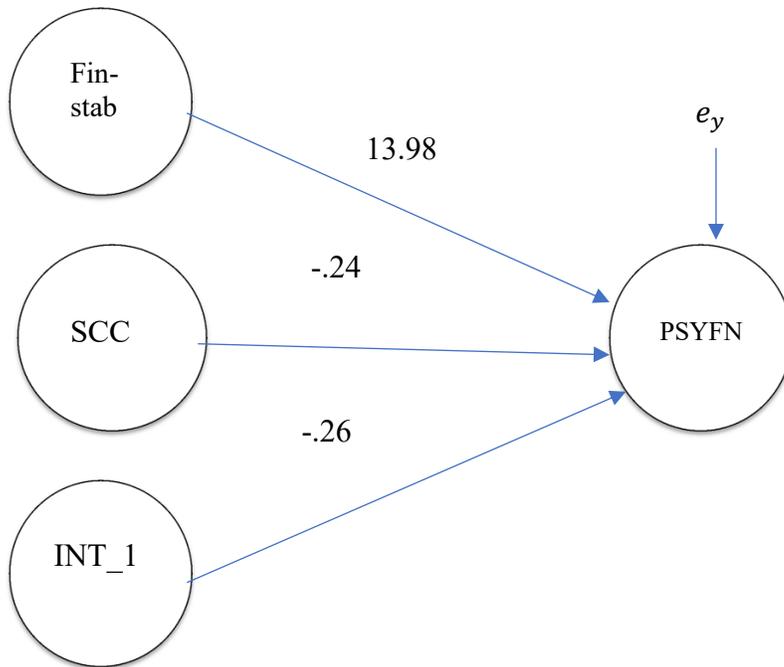


Figure 5: A simple moderation model evaluating whether or not SCC moderates the association between types of retirement and overall psychological functioning

Table 6

Self-Concept Clarity as a Moderator between Psychological Functioning and Type of Retirement

	Coeff	se	t	p	LLCI	ULCI
Constant	9.6774	6.1055	1.5850	.1140	-2.3359	21.6907
Retirement Type	13.9836	4.2716	3.2736	.0012	5.5787	22.3885
Self-Concept Clarity	-.2370	.1307	-1.8139	.0707	-.4942	.0201
Int_1	-.2568	.0940	-2.7318	.0067	-.4418	-.0718

Product term key:

Int_1: Type of Retirement x Self-Concept Clarity

Test(s) of higher order unconditional interactions:

	R2-chng	F	df1	df2	p
X*W	.0144	7.4630	1.0000	311.0000	.0067

Conditional effects of the focal predictor at values of the moderator(s):

SCC	Effect	se	t	p	LLCI	ULCI
36.6826	4.5636	1.2319	3.7045	.0003	2.1397	6.9875
46.2730	2.1008	1.0321	2.0355	.0427	.0700	4.1316
56.8634	-.3620	1.4961	-.2420	.8090	-3.3058	2.5818

**Level of confidence for all confidence intervals in output = 95.00

**W values in conditional tables are the mean and +/- SD from the mean

Finally, results of the last analysis to determine whether self-concept clarity moderates the association between daily pain and overall psychological functioning found that at higher values of X (higher levels of daily pain), participants scored higher on overall psychological functioning indicating worse overall functioning ($b_1 = 3.38$). When the moderating variable, self-concept clarity, was added into the regression analysis results showed that the interaction between self-concept clarity and daily pain was statistically significant ($F(1, 311) = 8.14, \beta = -.05, p < .01$). This confirms that self-concept clarity moderates the relationship between daily pain and overall psychological functioning such that at lower values of SCC, a stronger and more significant association exists between levels of daily pain and overall psychological functioning. In contrast, at higher values of SCC, a weaker and less significant association exists between the two variables. See figure 6 and table 7.

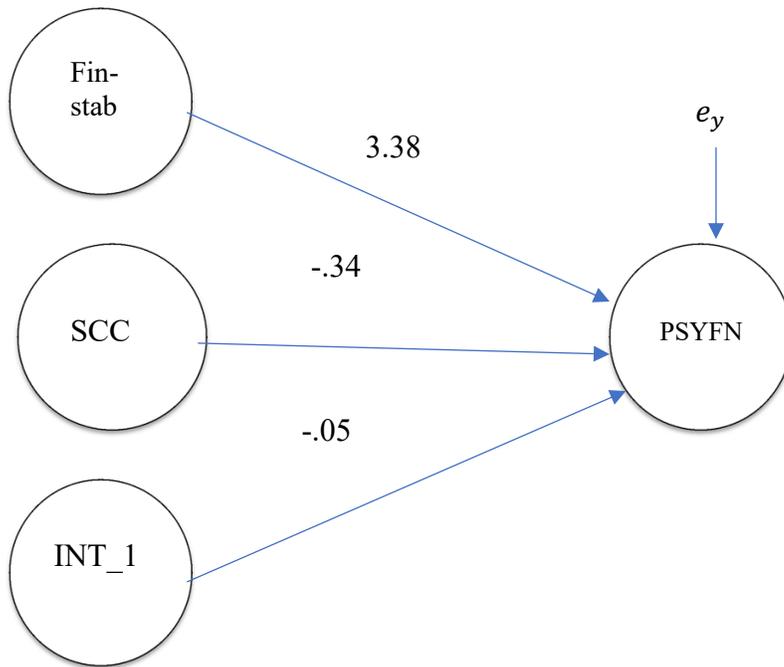


Figure 6: A simple moderation model evaluating whether or not SCC moderates the association between daily pain and overall psychological functioning

Table 7

Self-Concept Clarity as a Moderator between Psychological Functioning and Daily Pain Score

	Coeff	se	t	p	LLCI	ULCI
Constant	13.7747	4.0325	3.4159	.0007	5.8402	21.7091
Daily Pain	3.3838	.8738	3.8727	.0001	1.6646	5.1031
Self-Concept Clarity	-.3397	.0827	-4.1079	.0001	-.5024	-.1770
Int_1	-.0530	.0186	-2.8527	.0046	-.0896	-.0164

Product term key:

Int_1: Daily Pain Score x Self-Concept Clarity

Test(s) of higher order unconditional interactions:

	R2-chng	F	df1	df2	p
X*W	.0147	8.1381	1.0000	311.0000	.0046

Conditional effects of the focal predictor at values of the moderator(s):

SCC	Effect	se	t	p	LLCI	ULCI
36.6826	1.4397	.2487	5.7883	.0000	.9503	1.9292
46.2730	.9315	.1778	5.2399	.0000	.5817	1.2813
56.8634	.4232	.2546	1.6623	.0975	-.0777	.9242

**Level of confidence for all confidence intervals in output = 95.00

**W values in conditional tables are the mean and +/- SD from the mean

Mediation Analyses

Mediation analysis using bootstrap methodology was used to examine the relationship, including direct and indirect effects, between years active, years retired, daily pain and overall psychological functioning through the influence of self-concept clarity. Three mediation analyses were conducted using PROCESS 2.15 (Hayes, 2013) in SPSS (IBM Corps, 2013). Type 1 error was set at the .05 level. The seed was set to a random integer generated by the lead investigator when performing all bootstrap analyses so as to guarantee the replicability of results. The statistical models constructed to address the mediation analyses are defined as follows:

$$Y = i_1 + c'X + bM + e_y$$

$$M = i_2 + aX + e_m$$

Where M = Self-Concept Clarity, Y = overall psychological functioning, i_1 , i_2 = intercepts, a , b , and c' = residual coefficients given to antecedent variables in estimation of consequents, X = the independent variable (years active, years retired, daily pain), and e = standard error. Refer to figure 1 for representation of the proposed model.

When examining whether or not self-concept clarity mediates the relationship between years in active service and overall psychological functioning, the first part of the output shows the results of the simple regression of self-concept clarity predicted from the number of years a firefighter served on active duty. The data show that years active does not significantly predict self-concept clarity: $b = .06$, $t = .72$, $p = .47$. The second part of the output shows the results of the regression of overall psychological functioning predicted from both self-concept clarity and years active. The results show that years active significantly predicts overall psychological functioning when self-concept clarity

is included in the regression model: $b = -.16$, $t = -2.40$, $p = .02$. Self-concept clarity also significantly predicts overall psychological functioning: $b = -.52$, $t = -11.97$, $p < .01$. The negative coefficient for self-concept clarity shows that as self-concept clarity goes up, the score for overall psychological functioning declines indicating better overall psychological functioning. The negative coefficient for years active shows that as the number of years on the fire force increase the score for overall psychological functioning decreases indicated better overall psychological functioning. The final part of the output, which shows the indirect effect of years in active service on overall psychological functioning through self-concept clarity, was examined to determine whether self-concept clarity mediates the association between years in active service and overall psychological functioning. Based on the output, results show that the true b value for the indirect effect falls between $-.14$ and $.07$. Since the range between the lower and upper level confidence intervals includes zero, there was no significant indirect effect. In conclusion, self-concept clarity is not a mediator of the association between years on active duty and overall psychological functioning. See Table 8.

Table 8

Self-Concept Clarity as a mediator between years active and overall psychological functioning

Outcome Variable: SCC

Model:

	Coeff	se	t	p	LLCI	ULCI
Constant	45.32	3.18	14.27	.0000	39.07	51.57
yrsactv	.06	.09	.72	.47	-.11	.23

Outcome Variable: Psychological functioning

Model:

	Coeff	se	t	p	LLCI	ULCI
Constant	29.15	3.14	9.27	.0000	22.96	35.33
yrsactv	-.16	.07	-2.40	.02	-.29	-.03
SCC	-.52	.04	-11.97	.0000	-.61	-.44

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
-.16	.07	-2.40	.02	-.29	-.03

Indirect Effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
SCC	-.03	.05	-.14	.07

**Seed set at 28374839

When examining whether or not self-concept clarity mediates the association between years retired and overall psychological functioning the results of the simple regression of self-concept clarity predicted from the number of years retired shows that years retired does, in fact, predict self-concept clarity: $b = .27$, $t = .08$, $p < .01$. The second part of the output shows the results of the regression of overall psychological functioning predicted from both self-concept clarity and years retired. The results show that years retired significantly predicts overall psychological functioning when self-concept clarity is in the regression model: $b = -.16$, $t = -2.73$, $p = .01$. As was previously reported, self-concept clarity also significantly predicts overall psychological functioning: $b = -.52$, $t = -11.97$, $p < .01$. The negative coefficient for years retired shows that as the number of years retired increases, the score for overall psychological functioning decreases indicating better overall psychological functioning. Results from the final part of the output show the indirect effect of number of years in retirement on overall psychological functioning through self-concept clarity. Based on the output, results show that the true b value for the indirect effect falls between $-.24$ and $-.06$. Since the range does not include zero there is likely to be a genuine indirect effect, and self-concept clarity can be interpreted as a significant mediator in the association between number of years retired and overall psychological functioning. See table 9.

Table 9

Self-Concept Clarity as a mediator between years retired and overall psychological functioning

Outcome Variable: SCC

Model:

	Coeff	se	t	p	LLCI	ULCI
Constant	45.32	3.18	14.27	.0000	39.07	51.57
yrsrtrd	.27	.08	3.52	.001	.12	.42

Outcome Variable: Psychological functioning

Model:

	Coeff	se	t	p	LLCI	ULCI
Constant	29.15	3.14	9.27	.0000	22.96	35.33
yrsrtrd	-.16	.06	-2.73	.01	-.28	-.05
SCC	-.52	.04	-11.97	.0000	-.61	-.44

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
-.16	.06	-2.73	.01	-.28	-.05

Indirect Effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
SCC	-.14	.05	-.24	-.06

**Seed set at 28374839

Finally, when examining whether or not self-concept clarity mediates the association between daily pain and overall psychological functioning, the results of the simple regression of self-concept clarity predicted from the daily pain score shows that daily pain, in fact, predicts self-concept clarity: $b = -1.07$, $t = -4.65$, $p < .01$. The second part of the output shows the results of the regression of overall psychological functioning predicted from both self-concept clarity and daily pain. The results show that daily pain significantly predicts overall psychological functioning when self-concept clarity is in the regression model: $b = .93$, $t = 5.13$, $p < .01$. As was previously reported, self-concept clarity also significantly predicts overall psychological functioning: $b = -.52$, $t = -11.97$, $p < .01$. The positive coefficient for daily pain shows that as the score of daily pain increases, the score for overall psychological functioning also increases indicating worse overall psychological functioning. Results from the final part of the output show the indirect effect of daily pain on overall psychological functioning through self-concept clarity. Based on the output, results show that the true b value for the indirect effect falls between .32 and .81. Since the range does not include zero there is likely to be a genuine indirect effect, and self-concept clarity can be interpreted as a significant mediator in the association between number of years retired and overall psychological functioning. See table 10.

Table 10

Self-Concept Clarity as a mediator between daily pain and overall psychological functioning

Outcome Variable: SCC

Model:

	Coeff	se	t	p	LLCI	ULCI
Constant	45.32	3.18	14.27	.0000	30.07	51.57
pain	-1.07	.23	-4.65	.0000	-1.52	-.61

Outcome Variable: Psychological functioning

Model:

	Coeff	se	t	p	LLCI	ULCI
Constant	29.15	3.14	9.27	.0000	22.96	35.33
pain	.93	.18	5.13	.0000	.58	1.29
SCC	-.52	.04	-11.97	.0000	-.61	-.44

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
.93	.18	5.13	.0000	.58	1.29

Indirect Effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
SCC	.56	.13	.32	.81

**Seed set at 28374839

CHAPTER V

Discussion

The tripartite purpose of this study was to (1) better understand the nature of psychological disorders in retired firefighters and to determine which personal variables significantly related to increases or decreases in their overall psychological functioning; (2) to ascertain whether an association between self-concept clarity and psychological functioning exists and to determine whether or not self-concept clarity mediates or moderates the association between overall psychological functioning and independent variables such as daily pain, number of years active and retired, and access to affordable health insurance; and (3) to provide heuristic avenues of future research to address the needs of retired firefighters. This study also sought to build specific population prevalence findings of common psychological disorders faced by retired firefighters. The current study addresses a gap in the literature of first responder psychology by investigating the psychological functioning of firefighters in retirement, a previously unstudied group of first responders, and by providing a novel conceptual model that describes the mechanisms by which the psychological wellbeing of a retired firefighter increases through the strength of their self-concept clarity.

Results of our population prevalence findings showed that 21.9% of participants suffer from clinically significant depressive symptoms. This finding suggests that retired firefighters are more than twice as likely to suffer from depression than someone in the general population where prevalence rates of depression are typically less than 10% (Jahnke et al., 2016). Interestingly, the prevalence of anxiety disorders appears to diminish over the course of adulthood, with prevalence rates dropping to about 15.3% in

adults 60 years or older (Carmin & Ownby, 2010). Our study, where the majority of participants were aged between 51 and 80, found that 16.3% of participants experienced clinically elevated levels of anxiety, with symptoms ranging from panic to racing hearts and trouble swallowing, exhibiting only slightly higher rates than found in the general population. Research has shown that the prevalence rates for substance use disorders in the general population is about 12% for alcohol and 2-3% for illicit drugs (Merikangas & McClair, 2012). Our study found that 27.3% of participants suffered from clinically significant issues related to substance abuse, including tolerance and dependency, which is a significantly higher percentage than prevalence rates found in the general population.

Themes in the current research regarding first responder psychology typically deal with issues related to Posttraumatic Stress Disorder and suicidality. This study found that 11.1% of participants met full criteria for PTSD while 21.6% of respondents had clinically significant elevations on the TOP (Kraus, Seligman, & Jordan, 2005) psychosis scale which captured symptoms related to impaired reality testing including common PTSD symptoms such as nightmares and hypervigilance. These rates are slightly higher than prevalence rates of PTSD in the general population which are approximately 6.8% (Gawrych, 2010). Regarding suicidality, prevalence rates in the general population are reportedly between 1.9% and 8.7% (Nock et al., 2008b). This study found that 11.4% of respondents endorsed active suicidal ideation. Additionally, this study found that 23.5% of participants had significant issues with life satisfaction such as problems with mood and relationships with others, 16.2% of participants had clinically significant issues with problematic manic and hypomanic symptoms including impaired judgment and decreased need for sleep, 17.1% of participants had significant issues with social functioning

including extreme conflict within interpersonal relationships, 21.5% of respondents had clinically significant problems with sexual functioning including emotional problems related to sex and a lack of desire for sexual activity, and 37.8% of respondents had clinically significant issues with sleep including difficulty falling and staying asleep.

Correlation analyses revealed that age, length of time on active duty, and length of time retired each had significant negative associations with overall psychological functioning, meaning that the older the firefighter, the longer the firefighter has been retired, and the longer the firefighter was on active duty correlated with better overall psychological functioning. This is consistent with findings in previous studies that show younger firefighters as having significantly more psychological problems than their older counterparts, including increases in suicidal ideation (Stanley et al., 2015). Stanley et al. (2015) also reported that retirees were less likely to report suicidal ideation, and individuals with fewer years of service as a firefighter were more likely to report career suicidal ideation. This is consistent with our findings that the longer a firefighter is retired, and the more time they served on the fire force, the better their overall psychological functioning.

Unsurprisingly, the association between daily pain and overall psychological functioning was also significant, with participants who reported higher daily pain levels experiencing worse psychological functioning. Finally, participants who were forced into retirement, those who felt financially unstable, and those who felt they did not have access to adequate, affordable, and comprehensive health insurance all suffered from significantly worse overall psychological functioning than participants who voluntarily

retired, those who felt financially stable, and those who felt they had adequate, affordable health insurance.

Research has shown that self-concept clarity, a social psychological phenomenon related to a sense of identity and how a person truly sees him/herself, is related to psychological functioning in that the lower a person's self-concept clarity the more likely they are to be depressed, anxious, and have poor psychological adjustment (Campbell, 1990; Campbell et al., 2003; Pilarska, 2016; Santos et al., 2009; Smith et al., 1996). Research has also shown that weak self-concept clarity prevents flexible responses to changes in social roles, and when self-concept clarity is low there is an increase in neuroticism, anxiety, and depression (Suszek et al., 2018). Our study found that self-concept clarity had a significant negative association with overall psychological functioning, and significantly related to each of the psychological scales we assessed for with the exception of mania. This negative association indicates that the lower an individual's self-concept clarity the worse their psychological functioning as evidenced by significantly higher scores on each clinical scale.

Our study sought to gain further understanding of the importance self-concept clarity plays in the association between overall psychological functioning and other assorted variables. We explored this through the employment of simple mediation and moderation analyses. Results showed that self-concept clarity significantly moderated the association between overall psychological functioning and feelings of financial stability, overall psychological functioning and type of retirement (voluntary vs. forced), and overall psychological functioning and daily pain levels. When self-concept clarity was low in respondents, the association between overall psychological functioning and each

of the three previously mentioned independent variables was both significant and strong. As self-concept clarity increased in strength the relationship between overall psychological functioning and the previously mentioned independent variables became weak and non-significant. This showed that strong self-concept clarity acts as protection in retirees from worse psychological functioning even at higher levels of daily pain, forced retirement, and feelings of financial instability.

Results of the mediation analyses showed that self-concept clarity significantly related to both daily levels of pain and number of years retired. Indirect effects were then analyzed to show that overall psychological functioning was significantly related to both daily levels of pain and number of years retired through self-concept clarity, confirming that self-concept clarity acts as a significant mediator in the relationship between overall psychological functioning and both daily levels of pain and number of years retired. Specifically, lower levels of daily pain and higher number of years retired increased self-concept clarity which, in turn, reduced scores on overall psychological functioning suggesting better overall psychological functioning. Self-concept clarity, however, was not found to mediate the relationship between overall psychological functioning and number of years on active duty, and there were no significant direct effects between self-concept clarity and number of years on active duty, nor were there significant indirect effects of number of years on active duty on overall psychological functioning through self-concept clarity. Results of this study support themes in social psychology that when self-concept clarity is strong and intact there is increased contentment, life satisfaction, and overall feelings of wellbeing (Suszek et al, 2018).

Ultimately, this study showed that retired firefighters have significantly higher prevalence rates of many major psychological disorders than those found in the general population. The majority of retirees in our study also endorsed low levels of self-concept clarity which has been shown to correlate with worse overall psychological functioning especially in the wake of both a change in social roles and a loss of group identity. Results of our study also indicated that being equipped with a strong, stable sense of self-concept not only allows for flexible responses to changes in social roles and status, such as those experienced during retirement, but also protects from poor psychological functioning in the face of significant life challenges such as challenges of high levels of daily pain, feelings of financial insecurity, and limited access to affordable and comprehensive health insurance.

Strengths and Limitations

This study has several strengths to note. To our knowledge this is the first study conducted to examine the psychological functioning of retired firefighters. It is also the first study to look at moderating and mediating effects of self-concept clarity on the relationship between overall psychological functioning and personal variables such as levels of daily pain in retired firefighters. The nature of the cross-sectional design not only provided us with informative descriptive analyses useful for generating hypotheses to inform treatments and interventions, but also enabled us to measure prevalence rates for multiple disorders which is important in assessing the burden of psychological issues found in this specific population of first responders. Furthermore, understanding the role that self-concept clarity plays in the dynamics between personal variables and overall psychological functioning will ultimately help enhance the possibilities for preventative

and interventional measures to combat serious psychological problems in retired firefighters.

This study had several noteworthy limitations. While cross-sectional designs are useful for determining prevalence rates, they are highly susceptible to responder bias which was seen in the many significantly elevated scores on the Marlowe-Crowne Social Desirability Scale. It is likely that our prevalence rates are an underestimation of the true nature of psychological functioning in retired firefighters due to significant response bias and a concern to appear socially desirable. This study also failed to address causality, and therefore no inferences can be made as to whether retirement from firefighting caused low self-concept clarity or decreased psychological functioning or vice versa. Statements regarding causal effects and directionality are unable to be made without sufficient longitudinal data. Despite these limitations, our findings support existing literature dealing with psychological functioning in firefighters and goes beyond the existing literature by providing insights into a previously unstudied subset of first responders. Finally, our study did not control for social bias which will be an important step in future analyses.

Clinical Implications

Results from the current study have broad clinical implications for the development of both preventative measures and clinical interventions. Firstly, there are no documented programs for pre-retired or retired firefighters targeting mental health and wellness. Discussions with both retired and active firefighters revealed that current pre-retirement programs are tailored to financial planning as opposed to health and wellness in retirement. Results of this study have the ability to inform pre-retirement programs that

address risk factors for psychological issues in retirement and have the ability to inform the creation of interventions to help firefighters more successfully transition to their roles as retirees. Results of this study showed that retirees who are younger in age, who have served less time on the fire force, and who are newly retired are at the highest risk for psychological problems in retirement. Targeting firefighters with programs dedicated to enhancing psychological wellbeing before they retire could help alleviate the decreased psychological wellbeing that many firefighters experience as new retirees. Furthermore, targeting firefighters who fit additional risk categories such as those who have served less time on active duty and those who are younger in age could dramatically reduce psychological suffering in early retirement. Steps to ensure that retirees feel financially prepared and stable in retirement, have access to affordable, comprehensive healthcare, and have ways of safely and effectively managing their pain could also be instrumental in reducing psychological distress in retirement.

Finally, self-concept clarity was found to play an important role in the psychological functioning of retired firefighters. Results of this study have shown that individuals with low levels of self-concept clarity are at risk for worse issues with psychological functioning especially when other factors are in play such as high levels of daily pain, feelings of financial hardship, and a lack of access to affordable, comprehensive health insurance. While helping firefighters feel financially stable in retirement, helping them manage their pain, and helping them prepare for retirement in a way that leaves them feeling financially stable will undoubtedly improve their psychological wellbeing post retirement, interventions that target the strengthening of the clarity of their self-concepts and social identities can help further mitigate psychological

problems they might face if they find that retirement leaves them feeling unsupported financially, medically, and socially. This study has shown that when self-concept clarity is strong and intact, pain, financial burdens, medical problems, and more have much less of a deleterious impact on psychological wellbeing.

Future Research

This study has opened many avenues for future research. As was previously mentioned, this study did not control for social bias or address causality, both of which are important when trying to establish a comprehensive understanding of mental health problems in first responder retirees. Determining whether retirement causes declines in psychological functioning and self-concept clarity, or if the nature of active duty firefighting causes psychological problems that are then exacerbated by retirement will become important for a more in depth understanding of the psychological functioning of first responder retirees. Our data also captured percentages of prevalent physical health issues (see Appendix A) faced by our retiree respondents. Though the data were outside of the scope of this study, future research should examine how physical health issues contribute to the psychological functioning and self-concept clarity of retirees. Finally, comparison studies should be conducted examining the similarities and differences between retiree firefighters and other retiree first responder groups, such as police or correctional officers. This can help determine similarities and differences between how each group of first responders functions post retirement, which will ultimately help inform pre-retirement and retirement programs tailored to the unique needs of each specific first responder group.

References

- Abbasi, M., Rajabi, M., Yazdi, Z., Shafikhani, A.A. (2018). Factors Affect Sleep Quality in Firefighters. *Sleep and Hypnosis*, 20(4), 283-289. DOI: <http://dx.doi.org/10.5350/Sleep.Hypn.2018.20.0163>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.
- Angleman, A.J. (2011). Firefighter Stress: Association Between Work Stress, Posttraumatic Stress Symptoms and Cardiovascular Disease Risk (Order No. AAI3443961). Available from PsycINFO. 916529986; 2011-99220-133). Retrieved from <http://search.proquest.com.ezproxylocal.library.nova.edu/docview/916529986?accountid=6579>
- Barger, S.D. (2002) The Marlowe-Crowne Affect Scale: Short Forms, Psychometric Structure, and Social Desirability, *Journal of Personality Assessment*, 79:2, 286-305, DOI: 10.1207/S15327752JPA7902_11
- Baumeister, R. F., & Leary, M. R. (1995). The Need to Belong: Desire for Interpersonal Attachments as a Fundamental Human Motivation. *Psychological Bulletin*, 117, 497–529. DOI: <http://dx.doi.org/10.1037/0033-2909.117.3.497>
- Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and Initial Psychometric Evaluation. *Journal of Traumatic Stress*, 28, 489–498. DOI: 10.1002/jts.22059

- Boswell, J.F., Kraus, D.R. (2015). Treatment Outcome Package: Measuring and Facilitating Multidimensional Change. *The Journal of Psychotherapy*, 52(4), 422-431. DOI: <http://dx.doi.org/10.1037/pst0000028>
- Boxer, P.A., Wild, D. (1993). Psychological Distress and Alcohol Use Among Firefighters. *Scandinavian Journal of Work and Environmental Health*, 19(2), 121-125. DOI: 10.5271/sjweh.1497
- Campbell, J. D. (1990). Self-esteem and Clarity of the Self-Concept. *Journal of Personality and Social Psychology*, 59(3), 538–549. DOI: <http://dx.doi.org/10.1037/0022-3514.59.3.538>
- Campbell, J.D., Assanand, S., Paula, A.D. (2003). The Structure of the Self-Concept and Its Relation to Psychological Adjustment. *The Journal of Personality*, 71(1), 115-140. DOI: <http://dx.doi.org.ezproxylocal.library.nova.edu/10.1111/1467-6494.t01-1-00002>
- Campbell, J.D., Trapnell, P.D., Heine, S.J., Katz, I.M., Lavalle, L.F., Lehman, D.R. (1996). Self-Concept Clarity: Measurement, Personality Correlates, and Cultural Boundaries. *Journal of Personality and Social Psychology*, 70(1), 141-156. DOI: [10.1037/0022-3514.70.1.141](http://dx.doi.org/10.1037/0022-3514.70.1.141)
- Carey, M.G., Al-Zaiti, S.S., Dean, G.E., Sessanna, L., Finnell, D.S. (2011). Sleep Problems, Depression, Substance Use, Social Bonding, and Quality of Life in Professional Firefighters. *Journal of Occupational and Environmental Medicine*, 53(8), 928-933. DOI: 10.1097/JOM.0b013e318225898f

- Carmin, C., Ownby, R. L. (2010). Assessment of Anxiety in Older Adults. *Handbook of Assessment in Clinical gerontology (Second Edition)*. 45-60. DOI:
<https://doi.org/10.1016/B978-0-12-374961-1.10002-8>
- Centers for Disease Control and Prevention (CDC). (2016). *WISQARS: Web-Based Injury Statistics Query and Reporting System*. Retrieved from
<http://www.cdc.gov/ncipc/wisqars/default.htm>
- Chu, C., Buchman-Schmitt, J.M., Hom, M.A., Stanley, I.H., Joiner Jr., T.E. (2016). A Test of the Interpersonal Theory of Suicide in a Large Sample of current Firefighters. *Psychiatry Research*, 240, 26-33. DOI:
<http://dx.doi.org/10.1016/j.psychres.2016.03.041>
- Corneil, W., Beaton, R., Murphy, S., Johnson, C., & Pike, K. (1999). Exposure to Traumatic Incidents and Prevalence of Posttraumatic Stress Symptomatology in Urban Firefighters in Two Countries. *Journal of Occupational Health Psychology*, (4) 131-141. DOI:
<http://dx.doi.org.ezproxylocal.library.nova.edu/10.1037/1076-8998.4.2.131>
- Coursolle, K.M., Sweeney, M.M., Raymo, J.M., Ho J. (2010). The Association Between Retirement and Emotional Well-Being: Does Prior Work-Family Conflict Matter? *Journal of Gerontology: Social Sciences*, 65B(5), 609-620. DOI:
10.1093/geronb/gbp116
- Crowne D., Marlowe D. (1960) A New Scale of Social Desirability Independent of Psychopathology. *Journal of Consultation and Clinical Psychology*, 24:349–354. DOI: <http://dx.doi.org.ezproxylocal.library.nova.edu/10.1037/h0047358>

- Del Ben, K.S., Scotti, J.R., Chen, Y., Fortson, B.L (2006). Prevalence of Posttraumatic Stress Disorder Symptoms in Firefighters. *Journal of Work & Stress*, 20(1), 37-48. DOI: 10.1080/02678370600679512
- Duff, A.J., Chan, C.C.A. (2014). Investigating Suicide as a Career Response. *Journal of Career Development International*, 19(1), 4-26. DOI: 10.1108/CDI-04-2013-0040
- Eastlake, A.C., Knipper, B.S., He, X., Alexander, B.M., Davis, K.G. (2015). Lifestyle and Safety Practices of Firefighters and Their Relation to Cardiovascular Risk Factors. *Work: Journal of Prevention, Assessment & Rehabilitation*, 50(2), 285-294. DOI: <http://search.proquest.com.ezproxylocal.library.nova.edu/docview/1673082491?accountid=6579>
- Fahy, R., Leblanc, P., Molis, J. (2018, July 2). Firefighter Fatalities in the United States in 2017. *National Fire Protection Association Journal*. Retrieved from: <https://www.nfpa.org/News-and-Research/Publications-and-media/NFPA-Journal/2018/July-August-2018/Features/Firefighter-Fatalities>.
- Farnsworth, J.K., Sewell, K.W. (2011). Fear of Emotion as a Moderator Between PTSD and Firefighter Social Interactions. *Journal of Traumatic Stress*, 24(4), 444-450. DOI: 10.1002/jts.20657
- Finney, E.J., Buser, S.J., Schwartz, J., Archibald, L., Swanson, R. (2015). Suicide Prevention in Fire Service: The Houston Fire Department (HFD) Model. *Journal of Aggression and Violent Behavior*, 21, 1-4. DOI: <http://dx.doi.org/10.1016/j.avb.2014.12.012>

- Gawrych, A.L. (2010). PTSD in Firefighters and Secondary Trauma in Their Wives. Doctoral Dissertation. Retrieved from:
<http://search.proquest.com.ezproxylocal.library.nova.edu/docview/870551633?accountid=657> Order Number: AAI3421908
- Gill, S.C., Butterworth, P., Rodgers, B., Anstey, K.J., Villamil, E., Melzer, D. (2006). Mental Health and the Timing of Men's Retirement. *Social Psychiatry Psychiatric Epidemiological*, 41, 515-522. DOI: 10.1007/s00127-006-0064-0
- Gorry, A., Gorry, D., Slavov, S.N. (2018). Does Retirement Improve Health and Life Satisfaction? *Health Economics*, 27, 2067-2086. DOI: 10.1002/hec.3821
- Gulliver, S.B., Zimering, R., Knight, J., Morissette S., Kamholz, B., Meyer, E...Kimbrel, N. (2018). Tobacco and Alcohol Use Among Firefighters During Their First 3 Years of Service. *Psychology of Addictive Behaviors*, 32(3), 255-263. DOI: <http://dx.doi.org/10.1037/adb0000366>
- Haddock, C.K., Poston, W.S.C., Jahnke, S.A., Jitnarin, N. (2018). Alcohol Use and Problem Drinking Among Women Firefighters. *Women's Health Issues*, 27(6), 632-638, DOI: <http://dx.doi.org/10.1016/j.whi.2017.07.003>
- Haddock, C. K., Jahnke, S. A., Poston, W. S. C., Jitnarin, N., Kaipust, C. M., Tuley, B., Hyder, M. L. (2012). Alcohol Use Among Firefighters in the Central United States. *Occupational Medicine*, 62, 661–664. DOI: <http://dx.doi.org/10.1093/occmed/kqs162>
- Harris, M.B., Baloglu, M., Stacks, J.R. (2001). Mental Health of Trauma Exposed Firefighters and Critical Incident Stress Debriefing. *Journal of Loss and Trauma*, (7) 223-238. DOI: 10.1080=108114402900 57639

- Henderson, S.N., Van Hasselt, V.B., LeDuc, T.J., Couwels, J. (2016). Firefighter Suicide: Understanding Cultural Challenges for Mental Health Professionals. *Journal of Professional Psychology: Research and Practice*, 47(3), 224-230. DOI: <http://dx.doi.org/10.1037/pro0000072>
- Heyman, M., Dill, J., Douglas, R. (2018). *Mental Health and Suicide of First Responders* [White Paper]. Retrieved June 25, 2019 from the Ruderman Family Foundation: https://rudermanfoundation.org/white_papers/police-officers-and-firefighters-are-more-likely-to-die-by-suicide-than-in-line-of-duty/
- Hom, M.A., Stanley, I.H., Duffy, M.E., Davis, L., Joiner, T.E. (2018). Examining the Relationship Between Attitudes Toward Suicide and Suicide Attempt History: A Study of United States Firefighters. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*. Advance online publication. <http://dx.doi.org/10.1027/0227-5910/a000564>
- Hom, M.A., Stanley, I.H., Spencer-Thomas, S., Joiner, T.E. (2018). Mental Health Service Use and Help-Seeking Among Women Firefighters with a Career History of Suicidality. *Psychological Services*, 15(3), 316-324. DOI: <http://dx.doi.org/10.1037/ser0000202>
- IBM Corp. (2013). IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.
- Jahnke, S.A., Poston, W.S.C., Haddock, C.K., Murphy, B. (2016). Firefighting and Mental Health: Experiences of Repeated Exposure to Trauma. *Journal of*

Prevention, Assessment and Rehabilitation, 53(4), 737-744. DOI: 10.3233/WOR-162255

Kaipust, C.M., Jahnke, S.A., Poston, W.S.C., Jitnarin, N., Haddock, C.K., Delclos, G.L., Day, R.S. (2019). Sleep, Obesity, and Injury Among US Male Career Firefighters. *Journal of Occupational and Environmental Medicine*, 61(4), 150-154. DOI: 10.1097/JOM.0000000000001559

Kazdin, A. E. (1998). *Research design in clinical psychology* (3rd ed. ed.) Allyn & Bacon, Needham Heights, MA. Retrieved from <http://search.proquest.com.ezproxylocal.library.nova.edu/docview/619173256?accountid=6579>

Kim, J.I., Park, H., Kim, J. (2018). The Mediation Effect of PTSD, Perceived Job Stress and Resilience on the Relationship Between Trauma Exposure and the Development of Depression and Alcohol Use Problems in Korean Firefighters: A Cross-Sectional Study. *Journal of Affective Disorders*, 229, 450-455. DOI: <https://doi.org/10.1016/j.jad.2017.12.055>

Kimbrel, N.A., Pennington, M.L., Cammarata, C.M., Leto, F., Ostiguy, W.J., Gulliver, S.B. (2016). Is Cumulative Exposure to Suicide Attempts and Deaths a Risk Factor for Suicidal Behavior Among Firefighters? A Preliminary Study. *The Official Journal of the American Association of Suicidology*, 46(6), 669-677. DOI: 10.1111/sltb.12248

Kraus, D., & Castonguay, L. G. (2010). Treatment outcome package (TOP) – development and use in naturalistic settings. In M. Barkham, G. E. Hardy & J. Mellor-Clark (Eds.), *Developing and delivering practice-based evidence: A guide*

for the psychological therapies; developing and delivering practice-based evidence: A guide for the psychological therapies (pp. 155-174, Chapter xxv, 379 Pages) Wiley-Blackwell. DOI:

<http://dx.doi.org.ezproxylocal.library.nova.edu/10.1002/9780470687994.ch7>

Kraus, D. R., Seligman, D. A., & Jordan, J. R. (2005). Validation of a Behavioral Health Treatment Outcome and Assessment Tool Designed for Naturalistic Settings: The Treatment Outcome Package. *Journal of Clinical Psychology, 61*, 285–314.

<http://dx.doi.org/10.1002/jclp.20084>

Kubicek, B., Korunka, C., Raymo, J.M., Hoonakker, P. (2011). Psychological Well-Being in Retirement: The Effects of Personal Gendered Contextual Resources.

The Journal of Occupational Health Psychology, 16(2), 230-246. DOI:

10.1037/a0022334

Latif, E. (2011). The Impact of Retirement on Psychological Wellbeing in Canada. *The Journal of Socio-Economics, 40*, 373-380. DOI: 10.1016/j.socec.2010.12.011

Lee, J.H., Lee, D., Kim, J., Jeon, K., Sim, M. (2017). Duty Related Trauma Exposure and Posttraumatic Stress Symptoms in Professional Firefighters. *Journal of Traumatic Stress, 30*, 133-141. DOI: 10.1002/jts.22180

Lindwall M., Berg A.I., Bjälkebring P., Buratti S., Hansson I., Hassing L...Johansson B. (2017). Psychological Health in the Retirement Transition: Rationale and First Findings in the Health, Ageing and Retirement Transitions in Sweden (HEARTS) Study. *Frontiers in Psychology, 8*:1634. DOI:10.3389/fpsyg.2017.01634

Merikangas, K. R., McClair, V. L. (2012). Epidemiology of Substance Use Disorders. *Human Genetics, 131*(6), 779-789. DOI: 10.1007/s00439-012-1168-0.

- Milner, A., Witt, K., Maheen, H., LaMontagne, A.D. (2016). Suicide Among Emergency and Protective Service Workers: A Retrospective Mortality Study in Australia, 2001 to 2012. *Journal of Work*, 57, 281-287. DOI: 10.3233/WOR-172554
- National Institute for Occupational Safety and Health. (2001). *Firefighter Injury and Fatality Data*. [On-line]. Available: <http://www.cdc.gov/niosh/ar01contents.html>
- National Fallen Firefighters Foundation. (2014, August). *This is an alert from the National Fallen Firefighters Foundation*. Retrieved from <http://www.firehero.org/2014/08/15/national-fallen-firefighters-foundation-issuesstatement-suicide-prevention/>
- Nock, M. K., Borges, G., Bromet, E. J., Cha, C. B., Kessler, R. C., & Lee, S. (2008b). Suicide and suicidal behavior. *Epidemiologic Reviews*, 30, 133–154. DOI: <http://dx.doi.org/10.1093/epirev/mxn002>
- Olds, T., Burton, N.W., Sprod, J., Maher, C., Ferrar, K., Brown, W.J...Dumuid, D. (2018). One day you'll wake up and won't have to go to work: The impact of changes in time use on mental health following retirement. *PLOS One*, 13(6), 1-14. DOI: <https://doi.org/10.1371/journal.pone.0199605>
- Osborne, J.W., Waters, E. (2002). Four Assumptions of Multiple Regression That Researchers Should Always Test. *Practical Assessment, Research, & Evaluation*, 8(2), 105. Retrieved from: <https://pareonline.net/getvn.asp?v=8&n=2>
- Pilarska, A. (2016). How do Self-Concept Differentiation and Self-Concept Clarity Interrelate in Predicting Sense of Personal Identity? *The Journal of Personality*

and Individual Differences, 102, 85-89. DOI:
<http://dx.doi.org/10.1016/j.paid.2016.06.064>

Plat, M. J., Frings-Dresen, M., & Sluiter, J. K. (2012). Diminished health status in firefighters. *Ergonomics*, 55(9), 1119-1122.
DOI:<http://dx.doi.org.ezproxylocal.library.nova.edu/10.1080/00140139.2012.697581>

Psarros, C., Theleritis, C., Kokras, N., Lyrakos, D., Koborozos, A., Kakabakou, O...Bergiannaki, D. (2018). Personality Characteristics and Individual Factors Associated with PTSD in Firefighters One Month After Extended Wildfires. *Nordic Journal of Psychiatry*, 72(1), 17-23. DOI:
10.1080/08039488.2017.1368703

Rutter, P.A., Behrendt, A.E. (2004). Adolescent Suicide Risk: Four Psychosocial Factors. *Adolescence*, 39(154), 295-302. DOI:
<http://dx.doi.org.ezproxylocal.library.nova.edu/10.1037/t01198-000>

Santos, J.C., Saraiva, C.B., DeSousa, L. (2009). The Role of Expressed Emotion, Self-Concept, Coping, and Depression in Parasuicidal Behavior: A Follow-Up Study. *Archives of Suicide Research*, 13(4), 358-367. DOI:
10.1080/13811110903266590

Sharpley, C. F., Layton, R. (1998). Effects of Age of Retirement, Reason for Retirement, and Pre-retirement Training on Psychological and Physical health During Retirement. *Australian Psychologist*, 33(2), 119-124. DOI:
<http://dx.doi.org.ezproxylocal.library.nova.edu/10.1080/00050069808257392>

- Skeffington, P.M., Rees, C.S., Mazzucchelli, T.G., Kane, R.T. (2016). The Primary Prevention of PTSD in Firefighters: Preliminary Results of an RCT with 12 Month Follow-Up. *PLoS ONE*, 11(7), 1-22. DOI: 10.1371/journal.pone.0155873
- Slotter, E.B., Winger, L., Soto, N. (2015). Loss Without Each Other: The Influence of Group Identity Loss on the Self-Concept. *Journal of Group Dynamics: Theory, Research, and Practice*, 19(1), 15-30. DOI: <http://dx.doi.org/10.1037/gdn0000020>
- Smith, B.W., Ortiz, A., Steffen, L.E., Tooley, E.M., Wiggins, K.T., Yeater, E.A., Montoya, J.D. (2011). Mindfulness is Associated with Fewer PTSD Symptoms, Depressive Symptoms, Physical Symptoms, and Alcohol Problems in Urban Firefighters. *Journal of Consulting and Clinical Psychology*, 79(5), 613-617. DOI:10.1037/a0025189
- Smith, M., Wethington, E., Zhan, G. (1996). Self-Concept Clarity and Preferred Coping Styles. *The Journal of Personality*, 64(2), 407-434. DOI: <http://dx.doi.org.ezproxylocal.library.nova.edu/10.1111/j.1467-6494.1996.tb00516.x>
- Soteriades, E. S., Hauser, R., Kawachi, I., Liarokapis, D., Christiani, D. C., & Kales, S. N. (2005). Obesity and Cardiovascular Disease Risk Factors in Firefighters: A Prospective Cohort Study. *Obesity Research*, 13(10), 1756-1763. Doi:<http://dx.doi.org.ezproxylocal.library.nova.edu/10.1038/oby.2005.214>
- Stanley, I.H., Hom, M.A., Chu, C., Dougherty, S.P., Gallyer, A.J., Spencer-Thomas, S...Joiner, T.E. (2018). Perceptions of Belongingness and Social Support Attenuate PTSD Symptom Severity Among Firefighters: A Multi-study I

Investigation. *Journal of Psychological Services*, Advanced Online Publication,
DOI: <http://dx.doi.org/10.1037/ser0000240>

Stanley, I.H., Boffa, J.W., Hom, M.A., Kimbrel, N.A., Joiner, T.E. (2017). Differences in Psychiatric Symptoms and Barriers to Mental Health Care Between Volunteer and Career Firefighters. *The Journal of Psychiatric Research*, 247, 236-242. DOI: <http://dx.doi.org.ezproxylocal.library.nova.edu/10.1016/j.psychres.2016.11.037>

Stanley, I.H., Hom, M.A., Hagan, C.R., Joiner, T.E. (2015). Career Prevalence and Correlates of Suicidal Thoughts and Behaviors Among Firefighters. *Journal of Affective Disorders*, 187, 163-171. DOI: <http://dx.doi.org.ezproxylocal.library.nova.edu/10.1016/j.jad.2015.08.007>

Straud, C., Henderson, S.N., Vega, L., Black, R., Van Hasselt, V. (2018). Resiliency and Posttraumatic Stress Symptoms in Firefighter Paramedics: The Mediating Role of Depression, Anxiety, and Sleep. *The Journal of Traumatology*, 24(2), 140-147. DOI: <http://dx.doi.org/10.1037/trm0000142>

Sunderland, K.J. (2014). Officer Safety After the Badge: Preretirement Mental Health Training for Law Enforcement Officers. Doctoral Dissertation. Retrieved from: <http://search.proquest.com.ezproxylocal.library.nova.edu/docview/1709218635?accountid=6579>. Order number: AAI3639556

Suszek, H., Fronczyk, K., Kopera, M., Maliszewski, N. (2018). Implicit and Explicit Self-Concept Clarity and Psychological Adjustment. *The Journal of Personality and Individual Differences*, 123, 253-256. DOI: <https://doi.org/10.1016/j.paid.2017.11.038>

- Teuscher, U. (2010). Change and Persistence of Personal Identities After the Transition to Retirement. *International Journal of Aging and Human Development*, 70(1), 89-106. DOI: <http://dx.doi.org.ezproxylocal.library.nova.edu/10.2190/AG.70.1.d>
- Wagner, S.L., McFee, J.A., Martin, C.A. (2009). Effects of Traumatic Stress on Firefighters' World Assumptions. *Journal of Traumatology*, 15(1), 75-84. DOI: 10.1177/1534765608323441
- Wang, M., Shi, J. (2013). Psychological Research on Retirement. *The Annual Review of Psychology*, 65, 209-233. DOI: <http://dx.doi.org.ezproxylocal.library.nova.edu/10.1146/annurev-psych-010213-115131>
- Wetzel, R.D. (1975). Self-Concept and Suicide Intent. *Psychological Reports*, 36, 279-282. DOI: <http://dx.doi.org.ezproxylocal.library.nova.edu/10.2466/pr0.1975.36.1.279>
- Willis, K.D., Burnett, Jr. H.J. (2016). The Power of Stress: Perceived Stress and Its Relationship with Rumination, Self-Concept Clarity, and Resilience. *North American Journal of Psychology*, 18(3), 483-498. DOI: <http://dx.doi.org.ezproxylocal.library.nova.edu/10.1037/t01115-000>
- Wortmann, J.H., Jordan, A.H., Weathers, F.W., Resick, P.A., Dondanville, K.A., Hall-Clark, B...Litz, B.T. (2016). Psychometric Analysis of the PTSD Checklist-5 (PCL-5) Among Treatment Seeking Military Service Members. *Journal of Psychological Assessment*, 28(11), 1392-1403. DOI: <http://dx.doi.org/10.1037/pas0000260>

Appendix A

Data Regarding Physical Health of Retirees

Health Problem	Percentage
Allergies	41.6%
Anemia or Blood Disorder	8.6%
Asthma	7.6%
Back Problems	52.1%
Cancer	14.6%
Diabetes	19.0%
Headaches	15.6%
Heart Disease	18.4%
Blood Pressure Problems	47.6%
Hormonal Abnormalities (Thyroid, etc.)	13.0%
Immune System Problems (HIV, Autoimmune, etc.)	2.5%
Kidney Disease	5.7%
Liver Disease	2.9%
Lung or Breathing Disorder	14.3%
Neurological Conditions	4.8%
Obesity	17.1%
Ulcer or Stomach Issues	13.3%
Other Medical Conditions	24.4%