Where the devil dances:

A constructivist grounded theory of resilience in volunteer firefighters

A thesis submitted in partial fulfilment of the requirements of Nottingham Trent University for the degree of Doctor of Philosophy

March 2017

Leigh McCarley Blaney

CONTENTS

LIST OF FIGURES AND TABLES

ACKNOWLEDGEMENTS

Where the devil dances: A constructivist grounded theory of resilience in

volunteer firefighters

ABSTRACT

The purpose of this programme of study was to construct a theory of resilience in volunteer firefighters, a population that, despite facing intermittent and at times intense work-related stressors, is underrepresented in the resilience literature. Using a constructivist grounded theory (CGT) perspective, the study engaged a purposive sample of 8 firefighters from a single volunteer fire rescue service (FRS) in Canada, conducted in-depth interviews, and analyzed the data using CGT methodologies. The findings offer unique insight into the resilience of firefighters and demonstrate that resilience in the volunteer FRS is multidimensional, complex, dynamic, and contextual. The CGT asserts that within a volunteer FRS there are a number of concepts that inter-relate to construct resilience: relationships, personal resources, meaning-making, leadership, culture, and knowledge. Recently some researchers have noted relationships between concepts such as social support, adaptive health strategies, etc. (see for example: Almedom et al., 2010), and others are recognizing cultural influences on resilience (see for example: Panter-Brick & Eggerman, 2012), however, there is a dearth of literature linking all of the components together within a theory of resilience in high-risk professions such as the FRS. As well, many of the extant theories/models are linear whereas this theory is multidimensional and more patently represents the complex nature of resilience in volunteer firefighters. The findings further offer concrete strategies for practical integration of resilience theory into policies and actions to mitigate risks and enhance resilience in high risk professions such as the FRS. The outcomes of this programme of work have implications for volunteer firefighters, but there are also more global implications for career firefighters and other emergency service, disaster and humanitarian aid workers, and any organization or business that responds to emergencies, humanitarian crises or disasters.

CHAPTER 1: INTRODUCTION

Where the devil dances

I walk where the devil dances…I feel his breath upon my neck. The unbreathable, acrid stench. I see the destruction he wreaks on your world. The smoldering remains left in his wake. The life he takes. I see the pain he casts on you and your close ones. These things I never forget. I must push them aside for now. I can hear his laughter. He beckons me. A dare to draw closer. I have been here before. I am anxious but not afraid. I have brought my brothers with me, and we do not intend to lose this fight. Like insects we are drawn to the light. The stage of battle. He has woven many traps, but we are trained to foresee his cunning. We have removed his weapons. Power has been cut. The gas lines are off. His poisonous, hot breath is being vented away from us. Yet his laughter grows. He despises us. He knows that we cannot see through the smoke. He knows we cannot hear above his roar, above the chaos. The danger ahead is great, the heat inconceivable. This is the point at which many can go no further. But we have come to this party many times. We know his moves. Crawling single file, we split into twos. Someone will search for defenseless, fallen victims. And someone will show the devil himself how OUR moves go. We move in unison, instincts replaced by training. Each aware of what the other is doing at all times. To breach the wrong door or window could allow the beast to overtake us. He must be cornered and slain. When we reach our positions he lashes out with full might. Unbelieving that mere mortals would dare to enter his lair. But he has chosen the wrong place. He is not welcome here. And we do not take lightly his treatment of our kind. With thousands of gallons at our disposal, he is reduced to a pathetic pile of ash. Our axes and pike poles find his nests and expose them to the hose. Not a single glowing ember will be left to rekindle in the night. We save what we can. A picture. A bible. The blanket made by grandma before she passed away. He came to take everything that you own, including your life. Once again he has failed. But he will be back. When he comes, I will be there too. I walk where the devil dances.
I am a firefighter…

Author unknown

1.1   OVERVIEW

The metaphor of 'devil' has long represented the foe of firefighters, and this poem has been oft-cited by firefighters in my conversations with them over the past 20 years. Although the Fire Rescue Service (FRS) has changed over the years, and continues to change (more will be said about this in section 4.10 of the thesis), the narrative of firefighters involved in a life-or-death struggle of good against evil continues to prevail. Most recently (2016), in response to the conflagration that destroyed parts of the city and required the evacuation of 80,000

people, the Fort McMurray (Canada) fire has variously been referred to by residents and media as 'the devil', 'a devil fire', 'the devil's picnic', and 'a demon' (see for example: Hamilton, 2016). So regardless of the reality of the job in the 21st century, the symbolism of the firefighter running into danger, and risking life and limb in a battle against the devil and in service of the public, is the predominant narrative to those in the FRS, and to the general public in Canada.

From a workplace health perspective, the FRS is considered to be a 'high risk' occupation, one that carries significant risk of physical and/or psychological sequelae to the job (see for example: BC Firefighters Association, 1999; Haynes & Molis, 2015; Hill & Brunsden, 2003). Previous research on the mental health of firefighters has primarily focused on the 'illness' outcomes such as post-traumatic stress disorder (PTSD) (see for example: Bryant & Harvey, 1995; Haslam & Mallon, 2003). However, firefighters have a reasonably low incidence of PTSD relative to other emergency service providers such as police and paramedics (see for example: Del Ben et al., 2006; Halpern et al., 2008; Haslam & Mallon, 2003); there is little research related to the how and why of this phenomenon, nor into the role of resilience in adult, high-risk populations.

The phenomenon of *resilience* has been posited as a contributing factor to mental health – in individuals and communities – following adversity (see for example: Southwick et al., 2011). In previous firefighter research (Blaney, 2006), a serendipitous outcome was the surfacing of the term 'resilience' as an overarching concept when firefighters were discussing coping in the context of work-related traumatic events. Firefighters were found to be resilient (Blaney, 2012) when measured on a resilience scale (Wagnild, 2010); however, the interpretation, meaning, and understanding of resilience in the FRS has not been explored leaving gaps in the resilience literature, and leaving me curious about how and why firefighters are resilient.

1.2 STRESS AND RESILIENCE AS ADAPTIVE PROCESSES

Although my initial thinking was that I would test a model of resilience with firefighters in Canada and the UK in order to compare/contrast firefighter resilience in both countries, I discovered that there is not currently a relevant model of firefighter resilience to test.

Resilience is contextual (see for example: Bonanno et al., 2015; Hobfoll et al., 2015; Panter-Brick, 2014), and exploring contextual and cultural concepts is intriguing in order to broaden the understanding of resilience. However there is little resilience research with firefighters, and I could find no research on resilience in volunteer firefighters so jumping into the contextual factors seems premature if there is no foundational theory upon which to hang context. The existing resilience models/approaches define and describe resilience from a number of disciplines reflecting a variety of epistemologies, ontologies, and methodologies (see for example: Southwick, Bonanno, et al., 2014). Historically resilience research reflected a pathology orientation with either the presence or absence of disease as the variable (see for example Garmezy & Masten, 1991; Rutter, 1987) and, attempting to further understand resilience, tended to search for stable traits such as personality (Wagner, McFee, & Martin, 2010) to apply across ages, cultures, and contexts. Only recently (see for example: Ellis, 2015; Ellis & del Giudice, 2014) has stress and resilience research really begun to look at resilience as a somewhat innate adaptive process that is dynamic and contextual hence can be learned, enhanced, and developed across the lifespan and across cultures (see for example: Ellis & del Giudice, 2014; Panter-Brick, 2014). This perspective challenges the long-standing assumption that short-term and/or chronic stress is pathological (see for example: Juster et al., 2010) but as Ellis and del Giudice (p. 1) ask "why would natural selection have favored organisms that, by default, respond to chronic adversity by becoming dysfunctional or dysregulated?" Considering stress as an adaptive process shifts not only the contemplation of resilience and the human stress response but also our understanding of resilience as evolving from health rather than illness. A stress adaptation model also recognizes that stress and resilience may look and manifest itself differently across various contexts (see for example: Panter-Brick, 2014). As well, three other concepts - knowledge, an individual's perception of events as traumatic (or not), and availability and accessibility of resources - are linked to resilience in the context of adaptation to stress (see for example: Bonanno & Mancini, 2012; Deppa, 2015). The adaptive stress model is relevant to firefighters (see for example: Haslam & Mallon, 2003; Murphy, Durkin, & Joseph, 2011) who face ongoing work-related stressors yet tend to remain healthy (as defined by the World Health Organization, 2014) and resilient, and utilize a variety of health-focused resources (Blaney & Brunsden, 2015).

In summary, the existing models of resilience such as developmental, ecological, pathological (see for example: Masten, 2001; Rutter, 1987; & Ungar, 2011), etc. are not easily generalizable nor applicable to firefighters; there is a need to develop a theory of resilience in the fire context that is founded in health.

1.3   THE EVOLUTION OF THE CURRENT PROGRAMME OF STUDY

My previous research (Blaney, 2012; Blaney & Brunsden, 2015) looked at resilience in several fire rescue services (FRS) in Canada and the UK, using mixed methods and a health promotion lens, and demonstrated that firefighters are resilient as evidenced by scores on the resilience scale; they generally utilize healthy resources to deal with the negative outcomes of 'the job' (Blaney & Brunsden, 2015). Other research (see for example: Beaton et al., 1999) has noted that firefighters have 'unhealthy' coping strategies such as excessive alcohol use. In contrast, however, I found that firefighters incorporated multiple strategies such as lifestyle practices, proactive flexible resources, social support, etc., all of which are considered 'healthy' (see for example: Bonanno et al., 2011; Tehrani, 2011). Although my research found firefighters to be resilient (Blaney, 2012; Blaney & Brunsden, 2015) there was little exploration of firefighters' understanding of the concept of resilience, how firefighters construct the concept of resilience, and how resilience might relate to them individually and organizationally – important and pertinent concepts for understanding and operationalizing resilience that are also lacking in the extant literature. As well there appear to be some differences in how volunteer firefighters and career firefighters understand the human stress response, what incidents constitute 'traumatic events' and what strategies are commonly used to cope with post-event distress (see for example: Johnson, 2010), important issues that influence policy and practice. My ongoing work with firefighters in Canada continues to raise questions about how firefighters understand resilience in the context of their work, and what role resilience plays in their mental health (World Health Organization, 2014); mental health and well-being will be further discussed in section 2.6 of this thesis. It seems as well that it is important to understand resilience from the perspective of the volunteer firefighter since volunteers make up the majority of FRS in Canada (Karter & Stein, 2013) and worldwide; for example in Europe there are 2.7 million firefighters and 87% are volunteers (Woodrow, 2011) and in the United States there are 1,140,900 firefighters of which 69% are volunteers (National Fire Protection Association, 2015).

As my curiosity became more focused on volunteer firefighters and their experiences with, and definitions of, resilience, a thorough literature review (summarized in Chapter 3) found a dearth of research on psychological health or resilience in volunteer firefighters; although there are many theories of resilience (see for example: Atkinson & Martin, 2009; Southwick, Douglas-Palumberi, et al., 2014), none translate easily to the firefighter context. Resilience is implicated in mental health (see for example: Gilbert & Bilsker, 2012) and stress management, but there is a significant gap in knowledge about resilience in firefighters and there is a paucity of literature about volunteer firefighters in particular (as will be summarized in the literature review of this thesis). These gaps highlight the need to explore volunteer firefighters' perspectives of work-related stress, stressors, and coping, and to understand how those relate to resilience. As well, despite firefighters using the term 'resilience' in discussion of their mental health (see for example: Blaney & Brunsden, 2015) there is a lack of clarity in how firefighters define resilience and whether existing definitions and models of resilience are relevant and applicable in the firefighter context; existing definitions and models of resilience will be compared and contrasted in the literature review of Chapter 3.

1.4   PURPOSE AND AIMS OF THE RESEARCH

The purpose of this programme of study is to construct a theory of resilience in the context of volunteer firefighters. In order to support theory construction, the foundational aims of the research are: to explore the stressors, stress reactions, and coping strategies of firefighters in order to fully understand the volunteer firefighter context and to situate the study in an occupational mental health context; to define resilience in the context of volunteer firefighters and compare/contrast the definitions with existing understandings of resilience in order to highlight and address the gaps in theory; and to explore firefighters' conceptualizations of resilience which will offer the 'start point', within the firefighter context, for the current programme of study. The findings from these aims will provide the empirical underpinnings for the overall purpose of the programme of study: construction of a theory of resilience in volunteer firefighters.

1.5   RESEARCH QUESTIONS

It is important to acknowledge that there are well-articulated examples of people who

experience negative outcomes of workplace stressors such as post-traumatic stress disorder, and other injuries or disease; my thesis focuses on resilience, not at the expense or ignorance of those who may not appear nor feel resilient, but to add to the evolving understanding of resilience in high-risk professions. The research questions arise from the knowledge deficits about resilience in the FRS, and build on one another in order to help construct a theory of resilience in volunteer firefighters.

Foundational to this programme of study are questions about volunteer firefighters and their experiences with stress and coping in the FRS. There is a dearth of literature about volunteer firefighters yet assumptions are made that the research on traumatic stress in career firefighters and other emergency service providers applies to volunteers (see for example: Beaton et al., 1998; Beaton et al., 1999; Wagner et al., 2010); this may well be the case but currently there is little evidence to support this assumption. It is important as well to explicate firefighters' definitions of resilience because it is a term that is used frequently in the FRS, and it may or may not align with existing understandings of the concept; again, it is important to situate the discourse in the volunteer FRS and although there may be similarities with other firefighters, that is not clear at this point. And finally there are questions that lead to construction of a theory of resilience that integrates firefighter perspectives with the extant literature on resilience. The research questions are 'laddered' to build from these three overarching inquiries, and begin with questions about firefighter stress and coping to set the stage for the subsequent exploration into resilience specifically. The research questions are clustered into three sections:

Stress and Coping

    1.1. What incidents are considered by firefighters to be potentially traumatic?

    1.2. How do firefighters react to potentially traumatic events (PTEs)?

    1.3. How do firefighters 'cope' with their reactions to PTEs?

Defining Resilience

    1.4. How do volunteer firefighters define resilience in the context of the FRS?

A Theory of Resilience in Volunteer Firefighters

    1.5. What are the core concepts of a theory of resilience in volunteer firefighters?

    1.6. What are the relationships between and among those components?

This thesis articulates the programme of research investigating these questions and the grounded theory of resilience in volunteer firefighters that was constructed from the data.

1.6   ORIGINAL CONTRIBUTIONS OF THE STUDY

The thesis offers a number of original contributions to the field of resilience as well as to the disciplines of psychology and nursing, not to mention to the FRS. The research provides a new definition of resilience that reflects the complexity of the concept and its relevance across contexts, cultures, and experiences. The constructed theory offers novel links to systems theory, positive psychology, and salutogenesis, and provides credible and practical applications to the FRS. These concepts are unpacked in Chapter 9.

1.7   STRUCTURE OF THE THESIS

This introductory chapter has provided background and rationale for the programme of research, and has highlighted the research questions. Chapter two will detail relevant definitions and assumptions that underpin the programme of research. Chapter three provides a comprehensive review of resilience and firefighter literature, followed by a discussion in chapter four of the context of the study (volunteer firefighters, Canadian FRS, call volumes, etc.). Chapter five details the ontological and epistemological influences on the choice of research methodology and chapter six explicates the study's conduct. Chapter seven presents the analysis, results, and discussion of the data that emerged in response to the first two research questions related to stress, coping, and firefighter definitions of resilience. Chapter eight offers raw data and transforms the data into a multi-dimensional interactive theory of resilience in volunteer firefighters. Chapter nine discusses implications of the findings for policy and practice, as well as study limitations and areas for future research; importantly, the original and unique contributions of the theory are discussed.

CHAPTER 2: DEFINTIONS OF RELEVANT TERMINOLOGY USED IN THE THESIS

2.1   OVERVIEW

This chapter presents definitions that are used in the thesis, including structural considerations such as theory construction and terminology relevant to the salutogenic orientation of the thesis. As well 'resilience' is differentiated from recovery, coping, and resiliency. The chapter closes with an overview of the human stress response from an 'adaptive' perspective and using the health-oriented lay terminology of firefighters.

2.2   THEORY, CONCEPT, CONSTRUCT, AND MODEL

The terms 'theory', 'concept', 'construct' and 'model' are frequently used interchangeably in the literature but I understand them as having quite different meanings from one another; it seems prudent to the thesis to clarify the terminology. For the purposes of this thesis, the following definitions will be used.

Theory is the articulation of relationships between abstract concepts that aids in understanding or explaining those conceptual connections (Thornberg & Charmaz, 2012); what had been intuitive or invisible becomes evident in the construction of theory (Charmaz, 2014); theory may begin as speculative and abstract but ultimately becomes an organized system of knowledge and way of knowing.

Concept is an "abstract notion that is derived from a combination of personal intuition and consistent evidence" (Fletcher & Sarkar, 2013, p. 15); it is a narrative, which may be subjective or objective, and is used to summarize and connect multiple facts, and to formulate theories.

Construct is the representation of a theory or unobservable phenomenon, generally a subjective concrete schematic, model, image, or idea that contains conceptual components; an abstraction that is "deliberately invented (constructed) for a purpose" (Loiselle & Profetto-McGrath, 2011. p. 406).

Model is a representation or tool to understand a phenomenon and is less abstract than

theory; it is often used to describe/visualize a theory (Loiselle & Profetto-McGrath).

Resilience concepts are numerous (see for example: Doty, 2010) which has led to confusion in the conceptualization of resilience; for example the dichotomous conceptualizations of resilience as state/trait, or stable/dynamic, or developmental/innate, etc. (more will be said about conceptual confusion in section 3.3). There are many theories of resilience (see for example: Richardson, 2001) but not in the context of the FRS; this research seeks to explore *concepts* of resilience in volunteer firefighters and their understandings or *construction* of resilience in order to find relationships that provide some concrete explanations (models) as a foundation for constructing a theory of resilience.

2.3   CULTURE AND CONTEXT

The terms *culture* and *context* are used frequently throughout this thesis so a foundational understanding of each seems pertinent. These definitions are my own and are coalesced from years of understanding and experience with this terminology from my nursing background and from various dictionaries (see for example: Culture, n.d.).

Culture refers to a system of shared behaviours, customs, values, beliefs, symbols, and artefacts that members of a society use to cope with and make meaning of their world; the system is transmitted to members and generations through learned cumulative experience. In other words, culture is the way of life, aspects of life, social roles; meanings, ideas; learned language, values and norms shared by people in a group. The culture of the FRS is discussed in detail in sections 8.5. a-c but overall in this thesis refers to the shared values, actions, meanings, and language of firefighters.

Context on the other hand is the situations or settings of events or ideas in which the event/idea can be understood, assessed, made meaning of; context is the background climate of events, circumstances, or conditions. In this thesis, context generally refers to the setting of the FRS as opposed to for example a hospital; how firefighters engage in patient care on-scene may differ from how nurses engage in patient care due to the differences in context (individual skill sets, availability of resources, setting, etc.). Context throughout the thesis is used as the descriptor of settings or events.

2.4   STRESSORS, TRAUMATIC EVENTS, POTENTIALLY TRAUMATIC EVENTS, CRITICAL INCIDENTS, AND ADVERSITY

The terms *stressor*, *traumatic events*, *'potentially traumatic events'* or *PTEs, critical incidents*, and *adversity* also have various meanings and understandings within the literature as well as in practice, and the following section defines and differentiates these terms.

Stressors is a term commonly used within nursing (see for example: Halter 2014) and emergency services (see for example: Beaton et al, 1998). I've been working with firefighters and other emergency services personnel for over 20 years, and my definition of stressors has evolved to mean: an environmental (internal or external) stimulus that requires response and or adaptation; any stimulus or event that causes stress in an organism. This definition is congruent with Halter's perspective of a stressor as "psychological or physical stimuli that are incompatible with current functioning and require adaptation" (2014, p. 185). The commonality of these definitions is that they are non-clinical in nature and do not imply that deficits result; stressors result in common and expected human stress reactions (further discussed in section 2.8.a).

Traumatic events, in contrast, are clinically defined as those events that "cause a direct threat to the primary victim's life, psychological or physical integrity" (Leonhardt & Vogt, 2011, p. 65). Traumatic events engender a stress response hence there are physical, emotional, cognitive, behavioural and spiritual components to traumatic events (see section 2.8.a for human stress response). Traumatic events may result in a shift in worldview or beliefs, and may or may not result in traumatic stress (defined in next section of this thesis) or post-traumatic stress disorder. However, not everyone experiences events as traumatic, hence the term *potentially traumatic events* is a more relevant term (see for example: Bonanno, 2005; Mancini & Bonanno, 2009).

Potentially traumatic events or PTEs are those that are repetitive or isolated but are "potentially highly disruptive" (Bonanno, 2005, p. 135). However Bonanno noted the marked variability in people's responses to events that traditionally would be considered traumatic, with more people showing resilience and functional adaptation rather than trauma in the aftermath of these events; the inaccuracy of the term 'traumatic event' gave

way to PTE. This has been my experience with firefighters as well; the same event affects individuals differently but not always are the events experienced as trauma hence 'PTE' is a more accurate representation of the various incidents in the FRS.

Critical incident on the other hand is an event in which the individual "has secondary involvement in a traumatic incident as…rescuer…" (Leonhardt & Vogt, p. 65); in this case it is the individual's role that differentiates between traumatic event and critical incident, as well as the individual's perception that renders the event as stressful. The term 'critical incident' is commonly used in firefighter lexicon (Mitchell, 1983); again, critical incidents do not necessarily engender traumatic stress but may result in reactions that are part of the process of the human stress response.

Adversity imbues the resilience literature (see for example: Garmezy & Masten, 1991; Joseph, 2011; Rutter, 1987) but is a non-specific term that denotes unfavourable conditions or events, hardship, and/or suffering (see for example: Frankl, 1984). Overall, adversity is an experience that has potential to disrupt normal functioning (Riley & Masten, 2005) and may be specific, acute, or chronic (Noltemeyer & Bush, 2013). Again though, adversity results in heterogeneous responses that are more frequently healthy and adaptive rather than pathological. As noted by Kolar (2011) resilience is relative to the person's situations and experiences, and not readily separated from adversity.

It is evident that there are different understandings and uses of terminology and the terms are easily mistaken for one another, leading to assumed similarities and confusion. In this thesis, the terms stressors, PTEs, critical incidents, and adversity will be used interchangeably but generally refer to the 'tough calls' (see section 7.2) experienced by firefighters.

2.5   STRESS AND TRAUMATIC STRESS

There are significant differences in definitions of stress and traumatic stress. *Stress* is defined in my practice (nurse and educator) as a response to a perceived threat, challenge, or change; a state of physiological and psychological arousal; or the physical or psychological response to any demand (see for example: Cannon, 1953; Lazarus & Folkman, 1984; Selye, 1936, 1980). The common element in any definition is that stress is a *response* to a *stressor*

(something in the internal or external environment), and when the environment changes, we react/change physically and psychologically; since the environment is in constant flux, stress is unavoidable. Stress and adversity are necessary tensions that allow organisms to survive and grow (see for example: Joseph, 2011; Linley & Joseph, 2004; Murphy, Durkin, & Joseph, 2011). In contrast, Lazarus and Folkman describe stress as the person/environment relationship that "is appraised…as taxing or exceeding…" (p. 19) the person's resources and threatening their wellbeing. In this definition, stress is the perception of demand/response leading to negative outcomes. Hobfoll (2014) suggests stress is the "reaction to the environment" (p. 178) in which there is the perceived, or actual, loss of resources or lack of resource gain. Resources are objective and subjective, and characteristics, conditions, energies, or objects that have value and act as conduits to attaining other resources. Loss of resources predicts negative psychological outcomes and conserving resources assists in stress adaptation. As well, Hobfoll notes that "resource poor environments undermine resilience" (p. 178).

Traumatic stress results from traumatic events, those which "cause a direct threat to the [person's] life or psychological or physical integrity" (Leonhardt & Vogt, 2011, p. 65) and are seen to cause significant functional and psychological impairment and pervasive distress (see for example: Shakespeare-Finch, Paton, & Violanti, 2003). It is the nature, duration, and pattern of reactions that arise subsequent to stressful event along with significant functional impairment that distinguish stress disorders from one another. Traumatic stress uses the "adopted language" (Joseph, 2011, p. xv) of medicine, and focuses on deficits and pathology as well as implying the inevitability of negative psychological outcomes (Miller-Karas, 2015) hence differing from our current understanding of stress reactions as normal, expected, and adaptive. References to post-traumatic stress, acute stress disorder and post-traumatic stress disorder pervade the stress literature and as noted, are often implied to be the inevitable outcome of stressful events (see for example: NICE, 2015). However, trauma results not from the event, but from the individual's subjective experience of the event (WHO, 2014), and may be mediated by factors such as resilience (Hobfoll, 2014). Interestingly, the World Health Organization (WHO, 2014) notes that "traumatic events are common in people's lives" (p. 11); as a result, 'acute stress reactions' will no longer be classified as a mental disorder in the upcoming International Classification of Diseases – 11th

Edition (ICD-11) given the increased worldwide recognition of the wide range of normal and expected reactions to potentially traumatic events (Lucianno, 2014).

In summary, stress has been examined from various perspectives yet stress, stressors, and stress reactions have traditionally been viewed as deficits or as antithetical to psychological and physical health (see for example: Charney, 2004). Recently however stress and stress reactions have been interpreted as positive, adaptive, and growth-inducing (see for example: Bonanno, 2004; Ellis, 2015; Joseph, 2011, 2015; Youssef-Morgan & Luthans, 2015). It may be said therefore that adults are resilient by virtue of surviving multiple life experiences with stress. This post-medicalized vison of stress recognizes that stressors are routinely faced by humans on the journey from womb to tomb, and that the historical focus on negative outcomes of stress has not advanced our understanding of how and why people survive and thrive in the face of stress and other adversities. A health or salutogenic view of stress throws open the opportunities for the exploration of positive processes and outcomes to stress such as resilience.

For the purposes of this thesis, stress will be considered as the adaptive physiological and psychological processes that human beings experience as a result of a threat, challenge, or change. Traumatic stress is considered to be a pathological process and the term will not generally be used in this thesis; this is not to say that trauma cannot lead to suffering but this thesis provides an alternative lens to that of psychopathology in order to begin to balance the perspectives of health and illness (Joseph, 2011). Firefighters are not clinical or sub-clinical populations but are seen as reasonably healthy functional adults, and the above definitions have been adopted because of the post-medicalized and health orientation of the programme of study. In keeping with this health orientation, the following section will define salutogenesis and other health-related concepts.

2.6   SALUTOGENESIS, HEALTH, AND HEALTH PROMOTION

This research assumes a health orientation and explores resilience from a salutogenic perspective hence a basic familiarity with the concepts of salutogenesis, sense of coherence (SOC), and general resistance resources (GRR) is necessary. As well, distinguishing between health and health promotion will prove helpful to understanding the methodology and

methods of the study.

2.6.a   Salutogenesis

Antonovsky (1979) introduced the concept of *salutogenesis* (origins of health) and the salutogenic model (1996) as a paradigm for health and health promotion; the key premises are in defining, understanding, and supporting health, in contrast to the historical and dominant backdrop of pathogenesis (causes of disease).   Antonovsky described the human system as dynamic, living, yet flawed hence having potential for more health or less health. In contrast, he described the theoretical underpinnings of medicine as dichotomous and consumed with pathogens and risk factors, and unable to see that all humans are at diverse points on an ever-changing continuum between "health-ease" and "dis-ease" (1996, p. 14); Lindstrom and Eriksson (2006) explained health-ease as "total health" (p. 440) and dis-ease as complete ill-health. Although these terms seem dichotomous, it is important to bear in mind that they are situated on a dynamic continuum with the majority of people moving back/forth/around various positions on a non-linear continuum (Antonovsky, 1996). Antonovsky (1996) likewise acknowledged the difficulty in "operationalizing" (p. 14) the health-ease/dis-ease continuum and posed questions about how people move towards the health point of the continuum, advancing our understanding of health as dynamic. Antonovsky further noted that we cannot understand health as simply "being low on risk factors" (p. 14) for disease or by identifying people as their disease – they are complex beings well beyond their diagnostic status. Salutogenesis, studying the causes of health, provides the foundation for understanding and exploring that complexity. The central question raised by Antonovsky is "what creates health" (Lindstrom & Eriksson, 2006, p. 238), rather than asking what causes disease. Antonovsky (1990) also noted that stress and stressors are facts of life for all human organisms, and that people survive and even remain healthy and thrive in spite of ongoing adversity; the core concepts of salutogenesis help to explain how and why health is attained in the face of life challenges. Central to Antonovsky's thesis are the core components of SOC and GRR (Antonovsky, 1990, 1996).

It is the structure of the components of Antonovsky's theory that provides insight for this thesis. Antonovsky (1990) summarizes the components of SOC as: comprehensibility (people are able to make sense of their world), manageability (there are internal and/or external

resources available and accessible to cope with adversity), and meaningfulness (life is worth living and stressors are worth being coped with); these components provide a strong SOC which in turn facilitates "movement towards health" (1996, p. 15). Lindstrom and Eriksson (2006) further recognize that comprehensibility refers to the cognitive component, manageability is the behavioural component, and meaningfulness is the motivational component of SOC, demonstrating the broader 'systems' perspective of SOC and the complexity of the concept. Antonovsky (1987) suggests that SOC is not simply a matter of cognition – thinking one's way to a strong SOC – but SOC is moulded by consistent social and cultural support, work-life balance, and participation in individually and ecologically valued activities, aligning with others' (see for example: Almedom, 2005; Lindstrom & Eriksson, 2006) recognition of multiple components of SOC but also its core role in salutogenesis. The components of SOC are aligned with current conceptualizations of resilience, particularly developmental approaches (Masten & Narayan, 2012; Masten & Obradovic, 2006) and ecological models (Ungar, 2012a). For example, Ungar (2008, 2012b) finds that resilience is a process of interactions between people and their environments including family, friends, cultural practices; Ungar recognizes that the availability and accessibility of social support can be utilized to understand and manage stressors.

Associated with SOC are general resistance resources (GRRs), the factors that facilitate movement towards health. GRRs are both genetic and psychosocial (internal and external), and include but are not limited to: social support; cultural cohesion or stability; flexible accessible coping strategies; knowledge; material resources; commitment and orientation towards health, solutions, etc.; resilience; etc. (Antonovsky, 1990; Lindstrom & Eriksson, 2006). GRRs are not stand-alone factors but are in relationship with one another, and act/interact in diverse ways to facilitate health; as well, how those factors are utilized across time and context by individuals is key to salutogenesis. Once more, salutogenesis is evident in the resilience literature; for example, Bonanno (2013) highlights the relationship between flexible coping strategies and meaning-making in response to PTEs.

In summary, salutogenesis is an overarching health construct that is structured around the key concepts of SOC and GRR that help explain how and why health is attained in the face of life's adversities. Stress is seen as a normal and expected aspect of human life, and

salutogenesis answers the how and why people remain well despite stress. Together, SOC and GRR underpin salutogenesis; in turn, salutogenic/health orientation informs this programme of study on resilience in volunteer firefighters.

2.6.b   Health

The definition and conceptualization of 'health' differs across contexts and across disciplines, and often represents the dichotomy between health and illness/disease. In my nursing practice, and within the context of this study, I rely on the World Health Organization (WHO) who defined health as: "a state of complete physical, mental, and social well-being and not merely the absence of disease and infirmity (WHO, 1946, p. 1) and refined the definition of health to mean: the capacity of an individual or group "to realize aspirations and satisfy needs", and "to change or cope with the environment…a resource for everyday life…it is a positive concept emphasizing social and personal resources, as well as physical capabilities" (WHO, 1986, p. 322), meaning health is a dynamic, temporal, contextual, and socially constructed process. Mental health refers to a broad array of activities related to the mental well-being component of the WHO definition of health and is the focus of this programme of study. In order to achieve health, an individual or community must be able to satisfy needs, to cope with or adapt to their environment, and to realize aspirations which places the concept of health broadly within the interactions between body, mind, and social ecology.

Labonte (1989) notes: "Health exists in the dynamic movements of our social relationships" (p. 24), and "the power of defining health must belong to those who experience it" (p. 25) again highlighting the dynamic, interactive, and contextual constituents of health. The WHO suggested there are a number of fundamental conditions or determinants for achieving health, including: peace, shelter, education, food, income, social justice and equity, etc.; principles of social justice, equality, empowerment, and basic human rights of safety underpin the concept and activity of health promotion as discussed below.

The problem with describing health as a continuum is that invariably the visual image is of a single dimensional linear construct with dichotomous/opposing end-points; in order to avoid reductionist thinking an expanded vision of health – one of movement and change – is required. Taking the image one step further, I visualize health as an infinite helical structure

– a three dimensional spiralling concept that twirls back/forth through various dimensions of health but with multiple portals of access through, for example, the determinants of health. This contrasts with the traditional interpretation of health as the absence of illness and the privileging of cure/prevention tactics as the entry point to health. This study unabashedly sees resilience as a health construct, a dynamic interactive process that offers access to health and health promotion.

2.6.c   Health Promotion

Health promotion is defined by the World Health Organization as "the process of enabling people to increase control over their health and its determinants, and thereby improve their health" (WHO, 2009, p. 25), again a dynamic interactive concept that utilizes empowerment and social ecology such as community development to maintain and improve health.

The foundational document for health promotion is the *Ottawa Charter for Health Promotion* (WHO, 1986), which considers five actions to be key to health promotion: building integrated and complementary public policy; creating supportive environments for health that respect various contexts and cultures; developing personal skills through knowledge translation that allow people to understand and maintain health; strengthening community action through empowerment, participation and community development for personal and collective ownership of health; and re-orienting health services from the clinical curative focus to understanding and promoting health. As well as the five key actions, there are three health promotion strategies: enabling, mediating, and advocating that are necessary to ensure individuals and communities create conditions that promote health. Understanding the five actions and three strategies helps to demonstrate the complexity and multiple dimensions of health promotion, and begin to show how a reductionist view of health promotion will significantly constrict not only understanding but implementation of health promotion practice.

In keeping with the perspective of multiplicity, Lindstrom & Eriksson (2006) conceptualize the WHO's definition of health promotion as a three-phase dynamic model of interactions between the social determinants, the objective of leading a productive life, and the process of enabling people to access and utilize resources. This model allies closely with the

foundational theory of salutogenesis by: seeking solutions, identifying resources, and accessing capacities within individuals and communities, the "salutary factors" (Antonovsky, 1996, p. 14) that actively promote health.

Rootman and O'Neill (2012) suggest that health promotion is contingent upon planned change hence requiring education and information-sharing among stakeholders in order to make informed choices; as well, the use of multiple and varied strategies such as political action, community development, health education, and social media and marketing are key. At times 'health promotion' has been used interchangeably with 'health education' (Rootman & O'Neill); in fact, health promotion is a comprehensive, integrated, multi-component program of which health education is only one aspect. If we understand health as a helix with multiple access portals, conceptualizing health promotion as the integrated multiple processes/actions that provide access to health can assist in understanding these complex constructs. Reductionist approaches that conceptualize salutogenesis, health, and health promotion within single dimensional continuums fail to acknowledge the complexity of these concepts and their relationships to one another.

In linking salutogenesis to resilience, Antonovsky's discourses have made consistent attempts to avoid 'either/or' arguments in relation to other paradigms "choosing instead to focus on shared principles of logic and rigor of investigation, analysis, and interpretation of empirical evidence from multiple sources" (Almedom, 2005, p. 260) – a perspective that is inclusive, collaborative, and grounded in evidence, similarly to my understanding of resilience. Almedom, Brensinger, & Adam, (2010) present a balanced discussion of resilience as more than simply the absence of vulnerability.

These calls for health-focused collaborative approaches that build on a priori knowledge of resilience underpin my inquiry with volunteer firefighters. The evolution of broader perspectives and the situation of resilience within this multidisciplinary, salutogenic framework provides opportunities for numerous voices and perspectives (including those of stakeholders such as firefighters) to be heard; multiple perspectives can then be integrated into construction of resilience theory contextually relevant to volunteer firefighters.

2.7   RESILIENCY, HARDINESS, RECOVERY, COPING, and RESILIENCE

Resiliency, recovery, hardiness, coping, and resilience are terms that are often used interchangeably in resilience discourse but I understand them as quite divergent concepts. *Resiliency* is an individual personality trait that is independent of adversity and is a static trait that is not amenable to change (Masten, 1994). *Hardiness* is an individual resource or factor that contributes to resilience (see for example: Bartone, 2006; Bonanno, 2004; Ungar, 2008); hardiness is a style of functioning that includes commitment, control, and openness to change (Bartone, 2006; Maddi, 2005). *Recovery* (Bonanno, 2004) is similar to resilience in that it occurs after an adverse event; in contrast to resilience, functioning is temporarily disrupted to the point that people meet clinical or sub-clinical criteria (Schmidt, 2015) for disease but over time (weeks to months) return to pre-incident functioning.

Coping and resilience are often indistinguishable in the literature (see for example: Richardson, 2002; Robertson et al., 2015). However, coping is the conscious effort to manage stressors or to mitigate stress reactions through the utilization of physical, cognitive, emotional and/or behavioural strategies - the accessing and utilization of available resources; coping is a sub-category of resilience. Coping is an action where strategies are employed after an event has been appraised as stressful. *Resilience* on the other hand is the capacity of people, when faced with potentially traumatic events (PTEs), to maintain reasonably healthy and stable functioning; there is a fairly immediate 'bounce back' to pre-trauma functioning. Resilience is a multidimensional transformational 'system' of interactional pathways which are "socially constructed and culturally bound" (Berger, 2016, p. 7) and include resources that are not limited to 'coping'. More succinctly, resilience "influences how an event is appraised whereas coping refers to the strategies employed following appraisal" (Fletcher & Sarkar, 2013, p. 16).

This study explores *resilience*, the capacity of volunteer firefighters to face PTEs yet continue to maintain trajectories of health and function; as noted in section 1.2, the rationale for this focused approach is not to exclude those who do not remain healthy, but to ensure that gaps in the literature related to resilience in high-risk professions begin to be addressed.

2.8   ASSUMPTIONS OF THE STUDY

In the context of the volunteer FRS, construction of a theory of resilience rests upon understanding the human stress response and recognizing that in this context responses that may be viewed as pathological in other contexts are in fact 'normal and expected' in the FRS. Hence resilience is defined within the context of ongoing stressors/adversities (stimuli) in the workplace, and as the positive adaption including return to equilibrium after experiencing the human stress response (response).

2.8.a 'Normal And Expected' – Understanding The Human Stress Response As An Adaptive Process

Understanding the context of FRS in relation to workplace stress warrants a brief overview of the human stress response. Indubitably the stress response is a complicated process and series of interactions between body and mind, with many intricate psycho-social-biochemical reactions that take place when the brain becomes aware of a stressor. Following is a lay description of the human stress response that underpins my nursing practice, and which firefighters in this study recognize as 'normal and expected' rather than pathological. See Figure 1 – The Human Stress Response at the end of this thesis section for a visual representation of the process.

A stress reaction (whether the stressor is internal or external) begins with information entering the brain through one or more of the five senses: sight, sound, smell, taste, touch. The sensory information enters the cortex portion of the brain whose functions include: analysis, reason, intuition, cognition or thinking; the cortex contains the mechanism for communication, creativity, conscience, problem-solving, and memory. The cortex interprets significance of sensory input; this loosely constitutes the phenomenon of 'cognitive appraisal' that in turn may result in psychological alertness or a cue for the brain/body to remain alert. The cortex then shares this information with the limbic system.

The limbic system is the 'bridge' between the more evolved cortex and the basic, life maintenance system of the brain stem and has multiple functions and pathways. Key to this discussion, the limbic system provides basic emotions (such as love, fear, anger, disgust) for the information that has been passed on to it by the cortex. If the cortex and the limbic system process the sensory information and conclude that there is a threat, challenge, or

significant change to be met, emotional arousal occurs in conjunction with cognitive appraisal of threat, and a stress reaction begins.

Alertness, or arousal, of the cortex and limbic systems results in a rapid transmission of that state of arousal to the hypothalamus, which is the communication centre between the higher brain and the body. Once aroused, the hypothalamic messages stimulate the excretion of adrenaline and noradrenaline in the form of epinephrine and norepinephrine into the bloodstream. These 'sympathomimetic agents' act as stimulants that increase the level of stress arousal so that once epinephrine is in the bloodstream, it further stimulates the brain to alert the rest of the body to react to the stressor. The cortex and limbic system are further aroused by the epinephrine and very quickly process all the information coming in through the senses. Messenger chemicals stimulate excretion of powerful endocrine chemicals such as glucose, cortisol, endogenous opioids (endorphins) and oxytocin to name a few. This chemical cocktail causes further physical outcomes: cholesterol and triglyceride (fats) levels rise rapidly in the blood resulting in fat cells (the raw materials for the liver to produce glucose which fuels muscles) appearing in large amounts; the liver produces large amounts of blood glucose; and protein levels (the building blocks of white blood cells and antibodies) increase dramatically in the blood. The overall effect of this chemical 'dump' is to cause the entire body to prepare to deal with the stressor by fuelling muscles, mediating pain, and causing the pupils to dilate to let in more light, the muscles to tighten, and the breathing, heart rate, and blood pressure to increase.

Although the description above uses lay terminology, this explanation highlights the intricacies and complexities of the physiological effects of stress reactions. Furthering the lay description and linking to evidence, this complex physiological response is sometimes known as the *fight or flight* reaction (Cannon, 1953). It is a primitive unconscious reaction to a perceived threat that is a healthy, normal, emergency reaction and can be lifesaving; we need some level of stress to adapt to change, to be creative, etc. (see for example: Ellis & del Giudice, 2014) as discussed in section 2.8 of this thesis.

Along with the physical components, Canadian physician and researcher Hans Selye (1980) noted a stress reaction has mental or psychological elements. The changes in the emotional

and cognitive (thinking) functions that are part of the stress response are not as readily apparent as the physical changes and are often confusing or frightening. People cannot 'see' them, but can feel the psychological changes. Most people can accept the outward physical changes associated with stress (tremors, increased BP, nausea) that are directly attributable to the chemicalisation that is occurring, but cannot associate forgetfulness, or inability to concentrate with the stress event (see for example: Everly & Lating, 2013). They feel out of control, and that sense brings out denial, anger, and hostility. They forget that the same chemicals that work on the physical self in a stress response also work on the psychological self.

As people experience increased levels of physical distress in response to stressors, they begin to lose mental efficiency. The ability to remember new information decreases, as does short term memory. Concentration is difficult; distraction is common. People often report a sudden surge of ideas or their minds moving faster, but are unable to focus on one idea. Conversely things seem like they're moving in slow motion. Perceptions change, so that minor problems appear to be major hurdles. People become rigid in their thinking, and lose mental flexibility when viewing problems or solutions - so the ability to problem-solve is impaired. Making decisions is also difficult - people often develop tunnel vision and can't see other options. Criticism of ideas or suggestions are viewed as criticisms of self; people respond defensively, as if under attack. They, again with tunnel vision, are unable to deviate from the task they are doing.

People lose their sense of humour – which is one of the primary coping strategies of humans – its loss leaves them feeling vulnerable and defenceless. They lose the ability to think clearly, which intensifies their vulnerability hence their stress levels – a cyclical circular process. The ability to trust others diminishes – people doubt others' ability to assist in stressful times. People experiencing stress appear detached, alone, withdrawn, and not open to emotional support whereas they, in turn, see others as aloof, uncaring, and rejecting hence perpetuating emotional distancing from others.

Following, as Figure 1, is a diagrammatic representation of the human stress response:

Figure 1 – Human Stress Response
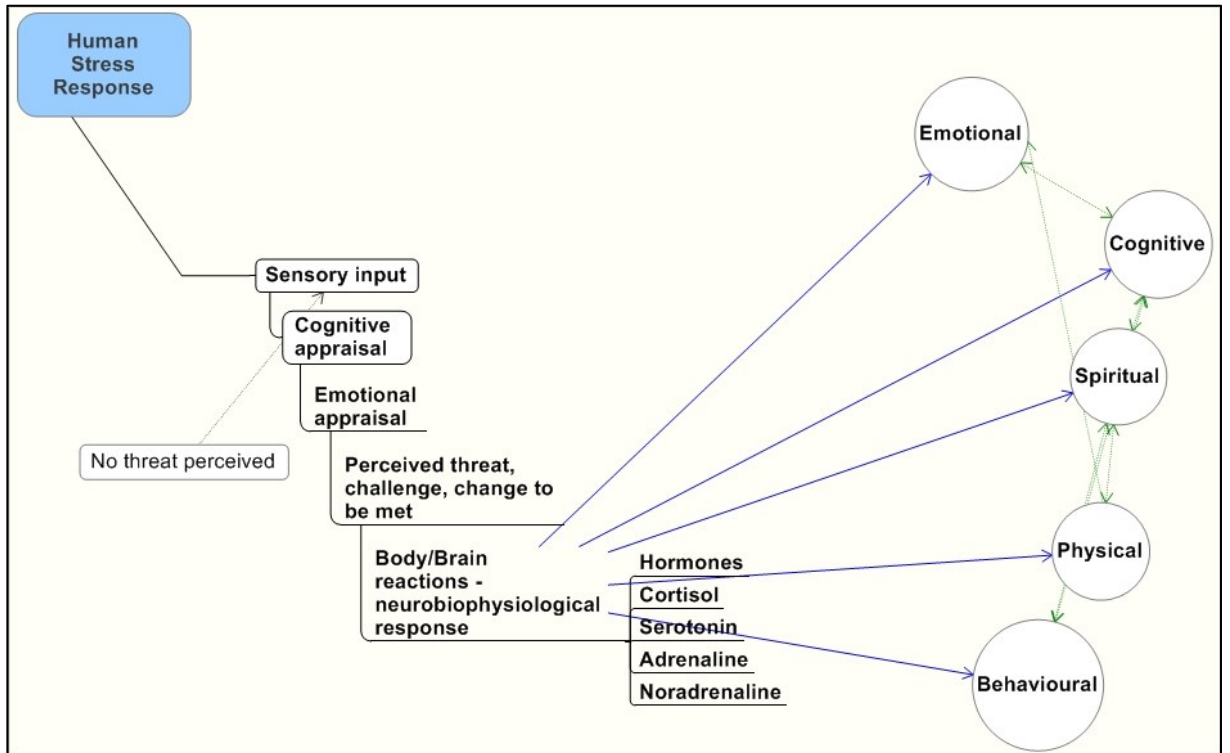
These changes appear psychologically destructive, but they are, in fact, beneficial because they serve the function of minimizing the probability of emotional overload in times of crisis. Figure 2 is a summary of stress reactions that routinely manifest themselves in some way in people:

Figure 2 – Common and Expected Stress Reactions

COMMON & EXPECTED STRESS REACTIONS FOLLOWING CRITICAL INCIDENTS

Blaney, L. (2015) for Archipelago CISM Society

PHYSICAL

Nausea, upset stomach, sweating, tremors Increased heart rate and blood pressure; Hyperventilation; chest pains; headaches; Muscle soreness; loss of coordination; fatigue

Muscle soreness, loss of coordination, fatigue

SPIRITUAL

Vague sense of unease about 'meaning' of life; Questioning the importance/relevance of 'little things'; Questioning self – do I have the right stuff; what's the point of doing this job; why am I doing this job? Questioning God – why did God let this happen? A sense of disconnection with self & world

EMOTIONAL

Anxiety, guilt, fear; Grief and depression; Emotional numbing; Helplessness, loss, abandonment; Withdrawal; Anger, resentment, scapegoating; Shock

BEHAVIOURAL

Pacing; restlessness; erratic movements; Changes in activity, speech pattern; Emotional outbursts

COGNITIVE

Impaired thinking and decision making; Poor concentration, poor memory, short attention span; Confusion; Flashbacks; Intrusive images

Few people will overtly demonstrate all of these reactions, but familiarity with the possible changes makes one more aware of the subtle changes that routinely occur. What has historically been seen as a destructive physical and psychological process is now viewed as adaptive and necessary (Ellis & del Giudice, 2014).

A premise underpinning this thesis is that the human stress response prepares the person to meet a threat, challenge, or change. Overall, the human stress response is normal, expected, and adaptive (Ellis et al., 2006), and at a primitive level as well as with more modern insights, it is life-sustaining. Pathogenic outcomes such as post-traumatic stress disorder seem to occur as a result of the human stress response 'gone wild'; however Almedom and Glandon (2007) note that under various conditions even so-called 'negative' responses such as sleeplessness, anxiety, and mood changes are part of the resilience process.

Bonanno and colleagues (2011) observe that flexible coping mechanisms activated in response to specific stressors and stress responses are integral to resilience even if those mechanisms appear to be maladaptive in the short term (emotional outbursts and other expressions of grief following bereavement for example). Ellis and del Giudice (2014)

present a balanced analysis of the adaptive value of the human stress response, noting that stress does not necessarily impair individuals but can assist in the development and enhancement of resilience. Everly and Lating (2013) note the human stress response is the process of coping with stressors and the coping strategies (innate and/or intentional) themselves are adaptive, particularly in the short term; *coping,* is defined in chapter 2.7 as the conscious attempt to mediate stress reactions or to manage stressors through utilization of resources. Strategies can also become maladaptive when healthy resources are depleted (Hobfoll, 2014) so it would seem intuitive to support and enhance health and resilience in order to have access to core healthy resources.

Firefighters face stressors that are outside the range of those faced by the general population (i.e. hot, airless, smoky environments; screams of pain and grief during motor vehicle incidents, etc.). These are some of the 'risks' undertaken by firefighters, and when choosing a career in the FRS, firefighters can be said to choose certain risks – unlike situations of global conflict or abuse perpetrated by one person to another where the risk is not a choice. That said, though, firefighters believe these are calculated risks that are only undertaken with training and in collaboration with colleagues (teamwork) as noted by research participants (see sections 7.2 and 7.3 this thesis), hence the risks are undertaken with choice, knowledge, and support.

There are examples during FRS training (i.e. in the use of self-contained breathing apparatus known as SCBAs) where firefighters learn to manage fear, and to a certain extent learn to override the human stress response, therefore increase their capacity to physically respond effectively to the 'calculated risks' of the job. What often hasn't been calculated with the physical risks though are the challenges to psychological health that come with rushing into danger, placing one's life at risk, and being faced with human tragedy on an ongoing basis. As noted at the beginning of this overview of the human stress response, it is the emotional and cognitive aspects of the human stress response that catch firefighters unawares hence result in seemingly more distress; intuitively it makes sense that education in, and experience with, psychological health practices are recognized to be of equal importance as training in SCBA's, hoses, knots, etc.

In summary, the human stress response is a complex inter-relationship between body and brain, intertwining biology and psychology, and implicates five primary domains of the human system: physical, emotional, cognitive, behavioural, and spiritual (Austin & Boyd, 2014; Blaney & Brunsden, 2015; Everly & Lating, 2013). It is imperative that firefighters understand that these reactions are normal, expected, and adaptive rather than pathological – the stressor/event may be abnormal, but the responses are common, normal, and expected (Mitchell, 1983), and to know that flexible coping mechanisms can be learned and integrated in order to decrease the distress associated with responses to particular events.

2.9   CHAPTER SUMMARY

In this chapter, I have clarified a number of terms and concepts that are used in the study such as theory/construct, stressor/PTE/adversity, stress/traumatic stress, and salutogenesis/health. Although there are some terms that have different meanings in other literature (i.e. adversity, stressor, PTE, etc.), these terms are used interchangeably in this thesis because it is firefighter reactions and coping in the context of resilience that are the variables of interest, not the stressors themselves. That said, firefighters in this programme of study offer their perspectives of what constitutes a PTE in order to situate those stressors in the volunteer context. As well, I have explicitly noted the 'health' orientation of the current programme of research, and offered rationale and literature from multiple perspectives in order to support this approach. Further, I have offered an overview of the human stress response, and noted, again from multiple perspectives, that it is an adaptive process that has 'normal and expected' responses, thereby advancing the conceptualization of stress as a health construct. Overall, this chapter has discussed a variety of concepts that typically have been loosely related to the FRS and/or resilience, and synthesized them to the volunteer firefighter context. The next chapter will offer a select review of extant literature about resilience; although there is a dearth of literature about volunteer firefighters, there is much to be learned from the work of authors with varying understandings and definitions of resilience in other contexts and cultures such as youth (Masten, 2001), the bereaved (Bonanno, 2004), and police (de Terte, Stephens & Huddleston, 2014).

CHAPTER 3: LITERATURE REVIEW

3.1   OVERVIEW

There has been an explosion of interest in resilience in the past decade, and the recent interdisciplinary nature of the literature is notable (see for example: Bonanno & Mancini, 2012; Bonanno, Romero, & Klein, 2015; Ellis, 2015; Masten, 2015; Panter-Brick, 2014). There have been many attempts to define resilience and those definitions are reflective of the ontologies and epistemologies of the various researchers as well as the evolving understanding of the richness and diversity within the concept of resilience. Multiple theories and models of resilience have been developed as a result of disparate methods and methodologies used to examine the concept of resilience, however there remains a dearth of literature related to firefighters and volunteer firefighters in particular.

This literature review is structured so that it addresses the overall purpose of the programme of study: construction of a theory of resilience in volunteer firefighters. It is organized into definitions of resilience by selected researchers, historical contexts of resilience, current theories of resilience, resilience and health promotion, and stress and coping in the FRS. The chapter will synthesize the literature in relation to firefighters. Key concepts relevant to the context of the FRS, such as Bonanno and Mancini's "minimal impact resilience" (2012, p. 378) will be integrated into a working definition which, in Chapter 7, will be integrated with firefighter definitions to assist in understanding resilience in this context. This chapter will continue with a discussion of existing theories of resilience and factors that contribute to resilience. Links between firefighters, health promotion, and stress in the FRS will be provided. The chapter will conclude with a discussion of a commonly used stress management program – Critical Incident Stress Management (CISM). The gaps in the literature related to definitions and theories of resilience in the FRS will become evident.

3.2   DEFINING RESILIENCE

There are calls for conceptual clarity in the definition of resilience (Davydov et al., 2010) but, to me, defining resilience is akin to defining *love* – the definition is experiential, phenomenological, and contextual. Prior to this research, I struggled to explain resilience, and frequently reflected back to song lyrics I had heard about a definition for love:

Perhaps love is like a resting place, a shelter from the storm
It exists to give you comfort, it is there to keep you warm…
Perhaps love is like a window, perhaps an open door…
…love to some is like a cloud, to some as strong as steel
For some a way of living, for some a way to feel
And some say love is holding on and some say letting go
And some say love is everything and some say they don't know
Perhaps love is like the ocean, full of conflict, full of pain
Like a fire when it's cold outside or thunder when it rains…

(Denver, J., 1981)

These musings on love parallel much of the discourse about resilience – multiple contexts, definitions, and experiences which coalesce into a deeper understanding but no clear definition. As with *love,* there is a tendency to attempt to reduce resilience into a simple, simplistic definition/explanation; this reductionist approach does not accurately represent our evolving understanding of the construct of resilience as a complex concept that defies simplistic/reductionist understandings.

Following are some definitions from a number of disciplines that have influenced my understanding of, and interest in, resilience in the emergency services; the definitions represent a synthesis of recent literature and ultimately offers my own definition of resilience. The framing of resilience as a health promotion construct is summarized, as is the context of the fire rescue services as the representative of high-risk professions.

3.3   DEFINITIONS - HOW RESILIENCE IS UNDERSTOOD IN VARIOUS CONTEXTS

A review of the literature across multiple databases including CINAHL, Academic Search Complete, Dissertations and Theses Global (Proquest), EBSCOhost, Medline, Health Source: Nursing/Academic Edition, PsychArticles, Sage, ScienceDirect, as well as publishers such as Taylor & Francis, Wiley, etc. using the keywords 'resilience', 'adults', and 'firefighters' elicited thousands of articles, many of which were not contextually or theoretically relevant to firefighters. The conceptualization of resilience generally remains focused on psychopathological outcomes of adversity. There are many definitions of resilience even within the predominantly developmental literature, and although various contexts are

considered in the literature, the majority focus on developmental resilience to long-term adversity (see for example: Masten, 1994; Rutter, 2012; Ungar, 2008). The population and context of firefighters is quite different in that they are adults who lead reasonably healthy lives physically and mentally, but they are regularly exposed to intense short-term work-related adversity that requires adjustment in order to continue on with the job (Jeannette & Scorboria, 2008; Johnson, 2010); the majority of firefighters are very successful in their adaptation (see for example del Ben et al., 2006). In a roughly chronological order in which I was introduced to these great thinkers, and following a format designed by Almedom (2005), here is a summary of the influences on my understandings of resilience from various disciplines. Appendix I summarizes, in table format, the researchers, contexts, and major tenets that are discussed in the following sections. The literature review leads from the original conceptualization of resilience as the absence of psychopathology (Garmezy, 1971) to the literature that supports my current view of resilience as a health construct (see for example: Bonanno, 2004).

3.3.a   Garmezy and Psychopathology

I became curious about the concept of resilience when, as a novice psychiatric nurse I came across the work of Norman Garmezy (1971), a clinical psychologist who led the field of developmental psychopathology, and noted the absence of psychopathology in children whose parents had a mental illness. Garmezy criticized the primary prevention models which underpinned much of the medical knowledge of his time and exhorted researchers to study the "invulnerables" (p. 114) who seemed immune to mental illness. For me, this was the first time since Florence Nightingale had urged us to "study the well" (1858, p. 114) that I noted there were lenses other than 'sick care' through which to view people, my nursing practice, and the 'evidence' informing my practice. Garmezy defined resilience as a "process of, or capacity for, or the outcome of successful adaptation despite challenging and threatening circumstances" (Garmezy & Masten, 1991, p. 459), noting the central element of resilience is in the individual's capacity for recovery & ability return to pre-trauma capacity/adaptation. Garmezy looked at whether factors such as cognitive skills, motivation and other 'protective factors' might hold clues to preventing mental illness; he studied from a pathology (or absence thereof) perspective. Garmezy was the first scientist that I was introduced to who articulated 'capacities' to overcome adversity but with his focus on

psychopathology the need to search for theories/thinking that looked beyond illness became my focus. Garmezy's conceptualization of resilience remains relevant to firefighters in his recognition that psychopathology is not the only outcome after exposure to adversity; overall more firefighters remain healthy than become ill despite ongoing exposure to critical incidents throughout their careers.

3.3.b   Rutter and Pathogenesis

Michael Rutter, a child psychiatrist whose research includes epidemiological studies with children on the Isle of Man as well as longitudinal studies with children from Romanian orphanages, co-authored books and articles with Garmezy in their shared interest in children of parents with mental illness. Rutter's work initially focused on pathogenesis and the absence of psychopathology, and allied closely with Garmezy's perspectives; he insisted that understanding risk and protective factors were key to understanding resilience. More recently, Rutter continues to explore resilience from the developmental perspective however notes the heterogeneity of responses to stressors (Rutter, 2012) that may or may not include psychopathology. Rutter's recent definition of resilience as the "relative resistance to environmental risk experiences, the overcoming of stress or adversity, or a relatively good outcome despite risk experiences" (2012, p. 34) has evolved over the past 20 years, but still remains focused on risks for disease. With Garmezy, Rutter suggested the 'steeling' effects of adversity (Rutter, 1987) – allowing for inoculation against negative adjustments to stressors, which aligns somewhat more closely with my health promotion lens and consideration of what keeps people well. However, Rutter continues to caution against 'depathologizing' resilience and notes that the development of resilience to adversity is hampered by biology, specifically genetics and epigenetics (Rutter, 2012); this viewpoint appears to come at the expense of broader contexts that look at personal meanings, interactions, attitudes, etc. that underpin my understanding of resilience. Early on though Rutter also warned against reductionism in the study of resilience (1999), alluding to the need to look at factors other than risks and protective factors, although his work remains rooted in the realm of psychopathology. Rutter's work is relevant to firefighter resilience in its recognition of the heterogeneity of responses to critical events, and in his encouragement to consider holistic approaches to defining and exploring resilience, concepts that become more obvious in the analysis in chapters seven and eight of this thesis.

3.3.c   Luthar and Developmental Resilience

Suniya Luthar and her colleagues bring disciplinary knowledge from clinical and developmental psychology and the context of developmental psychopathology in children and families. They define resilience as a "dynamic process encompassing positive adaptation within the context of significant adversity" (Luthar, Cicchetti, & Becker, 2000, p. 543); this is one of the first references to resilience as being dynamic and a process rather than a static trait or outcome. This is the beginning of the shift from Garmezy and Rutter's links to mental illness to a consideration of resilience in a broader context. Luthar et al. advocate exploring how/what mechanisms mediate effects of various resilience factors (i.e. if meaning-making is a protective factor, examining how and why meaning-making confers protection) in order to develop a robust understanding of resilience. Luthar et al. were early advocates of multidisciplinary integrated research, which is conspicuous in current literature (see for example: Southwick, Douglas-Polumberi, et al., 2014) and prominent in the findings of this study. Luthar and colleagues also used the term 'equifinality' to promote the study of various biological, psychological, and social pathways and context-specific factors that result in resilience, factors that figure prominently in the theory constructed from the data obtained in this programme of study. These are all relevant concepts to the current study because research questions two and three relate to how firefighters make meaning of the concept of resilience, and requires collaboration across disciplines that recognize the firefighters as the foundational discipline; this research also recognizes that there are likely multiple perspectives and 'components' of resilience that require exploration of those components and also the relationships among them.

Luthar and Cicchetti (2000) furthered resilience research by applying their findings to intervention and policy, offering concrete examples of resilience programs. Luthar and Cicchetti also provided guiding principles for future research that clearly demonstrated the evolving understanding of the complexity of the resilience construct; the principles include the requirements that resilience policy and procedure be evidence-informed, temporal (across various ages and developmental stages), contextual, health-focused, and ultimately self-sustaining. For the first time in resilience inquiry, Luthar and Ciccetti showed the considerable potential for resilience research and correlated it with the burgeoning interest

in positive psychology, and with the ongoing inquiry into resilience as a key variable in health and health promotion. These perspectives, in turn, continue to underpin current research, including this study's question 1.5 (what are the core concepts of a theory of resilience in firefighters) and 1.6 (what are the relationships between and among those concepts) where context, culture, and health are explored in order to develop a theory of resilience in volunteer firefighters.

3.3.d   Richardson's Metatheory and the Complexity of Resilience

Glenn Richardson, with his background in health science and health promotion, and from contexts that include individuals, families, organizations, and communities, did not initially 'define' resilience but recently (2012), on his faculty profile website, he states resilience is: "an innate force that progressively drives and guides people to increase their capacities by receiving infusions of desired qualities and virtues". Richardson was one of the first researchers to view resilience as individual and collective processes; more recently Ungar (2008) expanded on the collective aspects and considers resilience to be a social process (more will be said about this in section 3.3.j of this thesis chapter). Richardson developed a metatheory of resilience (2002), building on three 'waves' of resilience exploration: 1) the study of qualities of resilience in individuals; 2) the description of a resilience 'process' that includes accessing and integrating those resilient qualities; 3) recognition of the adaptation and growth that results from adversity (reintegration), and the multidisciplinary understanding of resilience. The evolution of the understanding of resilience through various 'waves' mirrors the evolution of occupational health programs in the FRS from being reactive to disease and illness to becoming more focused on 'wellness'; for example, see the web resources from the International Association of Firefighters (IAFF), the US-based firefighter union of professional/career firefighters.

Richardson's resilience model showed relationships between various levels of reintegration, but his relationships were one-way rather than reciprocal or interdependent as noted by subsequent researchers (see for example: Masten, 2015); a unidirectional relationship implies that one component is dependent on another rather than reciprocal. Richardson used the terms *resiliency* and *resilience*, suggesting resiliency is a process, and resilience is a set of qualities; in contrast, other researchers (see for example: Masten, 1994) define

resiliency as the character traits and resilience as the process. This is an example of the conceptual confusion evident throughout the literature. In order to provide clarity to my work with firefighters (Blaney, 2009, 2012; Blaney & Brunsden, 2015), I have considered resilience to be a process, and that is the perspective that I continue to hold as per the definition in Chapter 2 of this thesis; resiliency is a more ephemeral term that, for me, relates to a static trait within an object or person.

Richardson was a pioneer in considering the complexity of the concept of resilience and in noting the challenges associated with researching and articulating the construct. Importantly, Richardson noted the paradigm shift from looking at psychopathology and risk to looking at strengths, capacities and characteristics of people who thrived during and following adversity which is in keeping with firefighters' statement 'I'm not broken – stop trying to fix me' (Blaney, 2012). Richardson's model and metatheory, rather than being the definitive end-point of resilience exploration, became, for me, a start-point for more in-depth discussion and research into how resilience is understood and conceptualized as a process. *Resilient re-integration*, a key concept in Richardson's 2nd wave of growth/change as a result of adversity, is relevant to firefighters who face ongoing PTEs and are generally able to adapt to those adversities and to carry on with their work.

3.3.e   Masten and Developmental Resilience

Ann Masten, a clinical psychologist, has an impressive resume of research with children and youth in a wide variety of contexts including the study of school success in disadvantaged and homeless youth. Masten defines resilience as the "capacity of a dynamic system to adapt successfully to disturbances that threaten the viability, the function or the development of that system" (2014, p. 6). Individual resilience develops as "a pattern over time, characterized by good eventual adaptation despite developmental risk, acute stressors, or chronic adversities." (Masten, 1994, p. 3). Masten originally worked with Garmezy and subsequently has taken a developmental approach to risk and resilience focusing on adaptation and competence in children and youth exposed to adversity. More recently, Masten (2012, 2014) has been looking beyond individual resilience and has been considering resilience in the context of community which is relevant to firefighters who work in teams, crews, and watches who establish their own sense of community.

Importantly, Masten's seminal work (2001) notes the 'ordinary magic' of resilience – a recognition of how common resilience is across events and adversities – as opposed to previous conceptualizations of pathology as the common and expected outcome to adversity. Masten differentiates between *resilience* (a dynamic process of positive adjustment to adversity) and *resiliency* (discrete internal character or personality traits that may or may not relate to adversity) (Masten, 1994) which provides further clarity to Richardson's definitions of resilience and resiliency. Masten (2015) has noted that resilience is currently in the '4th wave' of resilience research which has evolved to an integrative transactional approach that must now consider neurobiological factors, and which recognizes individual factors as well as broader contexts such as community that support resilience. This perspective of the 4th wave contrasts with Liebenberg and Ungar (2009) who argue the focus of resilience research needs to be on social and ecological perspectives. I don't think the 4th wave is an either/or proposition; the discrepancies in perspectives reflect the ontological foundations of various researchers and offer opportunities for bringing biology and cultural contexts into future research, thereby enriching the breadth and depth of resilience research.

A tireless champion for the study of resilience, Masten (2015) advocates that understanding resilience requires engagement globally with multiple systems, across various disciplines and analytical levels. Masten also recognizes 'pathways' to resilience similarly to Bonanno's (2006) 'trajectories' of resilience (which will be further elucidated in section 3.3.k of this chapter). These concepts are relevant to firefighters by understanding that resilience is dynamic and multi-faceted, and can be mediated or changed over time, and that individual and collective pathways to resilience are heterogeneous. Although much of Masten's work has focused on children, her recognition of resilience as an expected outcome, a dynamic process, and a cross-cultural integrative transaction are relevant to current work with adults; in this case, volunteer firefighters who score high on resilience scales (Blaney & Brunsden, 2015) and for whom we require broader, more meaningful understandings of resilience in order to support resilience in the FRS.

3.3.f   Wagnild and Resilience as a Core Concept

Gail Wagnild and colleagues, with backgrounds in nursing and social work, researched across a number of cultures and contexts that include: older women following a major life event; children; adolescents; and American and European men, women, and children. Wagnild and Young (1990) defined resilience as a core concept which "connotes emotional stamina and…used to describe persons who display courage and adaptability in the wake of life's misfortunes" (p. 254) as well as "the capacity to live with purpose, perseverance, equanimity, authenticity, and self-reliance" (Wagnild, 2009, p. 105). Wagnild's five characteristics constitute a 'resilience core' which allows one to adapt or respond positively to inevitable adversity in life, and Wagnild and Young's work (1993) was one of the first references to resilience as a likely outcome following adversity. Wagnild's perspective is in line with health and health promotion but also focuses on adult populations facing various PTEs that not only may be chronic but possibly acute, similarly to firefighters. As well, Wagnild and Young's work with multiple populations crossing age, gender, ethnicity, etc. show transferability of resilience concepts across contexts.

Wagnild and Young (1993) developed the Resilience Scale (RS) which has shown validity and reliability across contexts and cultures, and has been administered by multiple disciplines such as nursing, psychology, education. The language of the RS is health and strengths focused which appeals to emergency personnel (see for example: Blaney & Brunsden, 2015), in contrast with other scales such as the Impact of Events Scale (IES) (Horowitz et al, 1979) and the Connor-Davidson scale (CD-RISC) (2003) which use deficit language. The RS scores are titrated from 0-175 and the RS finds firefighters to be "moderately resilient" (Blaney & Brunsden, p. 26), scoring an average of 127; other populations score widely divergently and there seems to be no 'common' score across contexts or cultures. The RS is available for a nominal fee directly from Wagnild via her website, making it an accessible option for measuring resilience in multiple contexts and cultures.

3.3.g   Antonovsky and Sense Of Coherence

Elaborating on the relationship between salutogenesis and resilience that was first introduced in section 2.6.a of this thesis was Aaron Antonovsky, a medical sociologist, who worked with menopausal women survivors of the Holocaust; although he did not specifically define resilience, Antonovsky noted that stress and distress are part of everyday life, and

raised questions about how people survive and thrive in spite of adversity. Antonovsky (1979) asked 'what causes health?' noting the availability of resources (material, psychological, and biological) and the ability to use them contribute to a *sense of coherence* (SOC), or making sense of the world through comprehensibility (understanding or making sense of challenges), manageability (having the resources to manage situations), and meaningfulness (finding meaning and motivation to carry on in spite of adversity). SOC is dynamic, pervasive, and applicable to individuals, communities, and across cultures (Lindstrom & Eriksson, 2006) which makes it relevant in my exploration of resilience in firefighters. A 'supportive culture' is named by firefighters in this study as relationships, support, and health orientation that contribute to resilience. In turn there is a reciprocal relationship that supports Antonovsky's findings across communities and cultures, both of which are evident in the FRS. SOC's application to individuals and groups renders it relevant to firefighters' work crews/teams and the FRS culture of 'brotherhood', a supportive family-like culture. Brotherhood is a cultural phenomenon perpetuated by the FRS and the IAFF, and has been found to have positive (Regehr et al., 2005) and negative (Robinson-Kitt, 2009) attributes (more will be said about this in section 8.2.b). As well, Antonovsky's health orientation is congruent with firefighters' exhortation to look beyond illness and to explore factors such as resilience that keep them healthy, and there are similarities between components of sense of coherence and aspects of resilience such as meaning-making; this study explicates those similarities and discusses them further in sections 8.5.a-c.

3.3.h   Almedom's Salutogenesis and Resilience

Astier Almedom and colleagues brought the multiple disciplines of anthropology, medicine, and community development to their review of resilience studies and their definitions of resilience as a "process, an outcome, a dynamic steady state in the face of adversity and defiance of risk/vulnerability" (Almedom & Glandon, 2007, p. 127). Almedom et al. (2010) articulated resilience as multi-dimensional underpinned by people's capacities and the added components of 'meaning-making' in order to maintain post-adversity identity and function. With these definitions, Almedom et al. establish the complexity of the construct of resilience, and allude to the inter-relationships between its components. Almedom and Glandon note that resilience is more than simply the absence of disease and is a complex, dynamic state that defies simple measurement and requires sophisticated and reliable tools.

Almedom and Glandon humorously note "there is no resilometer…to test resilience" (Almedom & Glandon, p. 130) to highlight the tendency towards reducing the construct into something that has little meaning.

Almedom (2005) provides the link between SOC and resilience, and notes that a critique of the psychopathology orientation of research does not equate to denial of pathology. Almedom makes a strong argument that salutogenesis is operationalized by the sense of coherence and underpinned by resilience. Almedom further suggests meaning-making is key to adaptation, and learning is key to understanding resilience at the systems' level; meaning-making is employed by firefighters as an allegory for dealing with critical incidents (Blaney, 2003; 2005; Blaney & Brunsden, 2015). Overall, Almedom and his colleagues' perspectives align closely to firefighters' focus on health, education, and the need to 'talk about' critical incidents in order to find/make meaning of the incident and the firefighter's response to it. As well, Almedom calls for mixed methods of research into resilience: qualitative analysis of meaning-making (ethnography, in-depth interviews) combined with measures of the components of Antonovsky's *sense of coherence*, and advocates "inquiry into the human spirit" (Almedom, 2005, p. 263), inquiry that defies a simple empirical measure. Almedom's expectation that multiple methods of research are essential reflects the recognition of the complexity of the concept of resilience and the limitations of purely quantitative studies, which, as will be discussed in chapters five and six, are in keeping with the choice of methodology and methods of this study.

3.3.i Yehuda and the Biology of Resilience

Rachel Yehuda, a 'biopsychologist', brings disciplinary influences from clinical and biological psychiatry, psychology, and neuroscience into her work with US combat veterans diagnosed with PTSD. Yehuda conceptualizes resilience as "a reintegration of self that includes a conscious effort to move forward in an insightful integrated positive manner" (Southwick, Bonanno, et al., 2014, p. 3), as well as learning from adverse events to aid in the reintegration; reintegration is reflective of Richardson's metatheory (2002) and the transformational aspect of 'moving forward' is congruent with Linley and Joseph's exploration of post-traumatic growth (Joseph, 2011; Linley & Joseph, 2012). Yehuda looks at the influences of genetics and epigenetics on resilience; *epigenetics* considers how changes

in the environment exert changes on genes and the way they function – which is of interest in understanding a myriad of 'unknowns' of resilience that permeate multiple disciplines such as mental health, medicine, and neuroscience. Yehuda's research includes the biological components of resilience and considers how the constant interactions of people with their environment may be mediated, in part, by biological underpinnings (Yehuda et al., 2013). As well, Yehuda notes that exploration of resilience is important regardless of how resilience is defined because the key message is not the definition but the outcome: trauma experiences do not necessarily result in pathology. This message has become much more consistent across disciplines over the past 10 years, and serves to move the field towards a broader, deeper understanding of the concept of resilience. However, for the current purpose of constructing a theory of resilience in volunteer firefighters, understanding the biological and intergenerational implications will wait for future research.

3.3.j   Ungar and Sociocultural Influences on Resilience
Social ecology and resilience

Michael Ungar's research is primarily focused on children, against his background of social work as the co-founder of the Resilience Research Centre in Canada, and crosses multiple contexts and cultures. Ungar defines resilience as the process used "to cope, adapt and take advantage of assets when facing significant acute or chronic stress, or the compounding effect of both together…the observable, often measurable, processes that are identified as helpful…to overcome adversity" (Ungar, 2012a, p. 387). In another definition, Ungar highlights the capacities of people to "negotiate [and] navigate" (2008, p. 225) culturally relevant physical, psychological and social resources in the face of adversity; this definition shows that our understanding of resilience goes beyond the recognition that people engage in resilient processes but must also have access to, and the ability to utilize, resilience resources – the social ecology of resilience. The breadth of both definitions clearly shows the complexity of construct as well as the difficulty inherent in attempts to reduce or simplify resilience as noted by Almedom and Glandon (2007).

Ungar's extensive body of work on the social ecology of resilience posits resilience as the processes utilized by individuals, families and communities to cope with and overcome

adversity in a variety of contexts and across populations and cultures, again moving beyond resilience as an individual process only. Collective resilience and cultural influences on resilience reflects the 'systems' contributions to resilience that surface in chapter nine's 'contributions' section of this thesis. Ungar (2008) further suggests that defining and measuring resilience requires a clear understanding of the role of physical and social 'ecologies' on the positive outcomes following adversity. In defining resilience Ungar notes that the term 'navigation' corresponds to other definitions of resilience that focus on personal motivation and agency (see for example: Masten, 2001; Rutter, 1999). However he extends navigation to include the forward momentum towards meaningful resources and the creation of an environment that provides available, accessible, and useable resources. Ungar's extended definition provides a broader and more meaningful lens through which to explore the concept of resilience as it shifts the discourse beyond individual resources to the ecological resources and processes that support resilience – a discussion that is clearly relevant to the unique culture and environment of the FRS.

Ecological principles of resilience

Ungar (2011) describes four principles that underpin resilience: 'complexity, cultural relativity, atypicality, and decentrality' which help define resilience and provide a framework for further research and practical interventions. *Complexity* refers to the need to recognize and systematically explore the complexity of the construct of resilience despite a tendency to reduce and simplify the relationships, processes, and outcomes within resilience studies. Ungar notes that "equifinality" (p. 7), the term used within systems theory to explain that a given end result may be attained through many means, requires that resilience research focus on processes instead of individual traits. Equifinality was also used by Luthar et al. (2000) to highlight the complexities inherent in defining resilience. A constructivist approach to defining resilience in the context of volunteer firefighters honours the recognition of the complexity of the construct and recognizes equifinality as this thesis develops a theory of resilience that leads to understanding of a context that has not been studied previously.

Cultural relativity relates to the understanding of culture as "the everyday practices through which individuals and groups manifest a set of shared values, beliefs, language, and

customs" (Ungar, 2011, p. 9). Ungar uses the example of attainment of common childhood developmental benchmarks (i.e. normative age tasks such as learning to walk) that are culturally negotiated hence vary across cultures. The cultural location of resilience becomes extremely relevant in order to recognize that behaviours may be idiosyncratic to that culture such as the so-called 'brotherhood' of the FRS, or that behaviours may be more global and shared amongst/between individuals and groups; either way, understanding the cultural context of those behaviours is imperative in order to develop an inclusive understanding of resilience factors. *Atypicality* refers to the idea that the usefulness of resilience processes is defined by context, and that outcomes are not dichotomous (i.e. formerly resilience meant the absence of psychopathology; in fact psychopathology is only one possible outcome to adversity). Atypicality may include affective strategies and environmental characteristics that protect individuals but which may be positive or negative in other contexts (i.e. firefighter depersonalization in the midst of a rescue mission; depersonalization is seen as negative in interpersonal relationships yet may be a necessary and ecologically correct response when in the midst of complex and dangerous situations). Understanding the context and functionality of what appear to be atypical behaviours is key to better understanding how various processes contribute to resilience. With *decentrality,* rather than inquiry that centres on the individual and how they manage their environment in order to be resilient, Ungar advocates *de-centreing* the individual and instead focusing attention on how the environment facilitates resilience. An example of de-centreing in this programme of study is in the exploration of the cultural aspects of the FRS as contributors or detractors to resilience.

Resilience and the availability of resources

Ungar notes that resilience results not necessarily from individual characteristics but more from the nature of, and availability and accessibility of, culturally appropriate resources – the facilitative aspects of the individual's physical and social ecology (Ungar, 2011). In the case of the current research, consideration of how ecological aspects (such as the culture of the FRS, meaning-making within the FRS, etc.) interact to support resilience is key to coming to a more in-depth understanding. For example, this programme of research has found that 'culture' is a contributor to resilience in volunteer firefighters (see sections 8.5.a-c). Ungar also argues for the use of mixed methods research for the in-depth study of the physical and

social 'ecologies'. Although Ungar's resilience research has focused on children in the context of chronic adversity, the recommendation for other methods certainly applies to adult populations such as firefighters facing acute adversities and/or PTEs; to date, studies into adult resilience remain minimal and incomplete (see for example, Blaney & Brunsden, 2015) as does research into all high-risk professions.

3.3.k   Bonanno and Resilience as the Norm
Resilience across contexts

George Bonanno's background in clinical psychology led him and his teams to explore resilience across multiple diverse adult contexts such as widows surviving the loss of a spouse, and survivors of the 9/11 attacks in New York (including emergency responders as well as civilian populations); as a result, Bonanno's conceptualization of resilience post-9/11 may be the closest analogy to the context of volunteer firefighters. Bonanno's research is multicultural, multidimensional, and uses construct validity and multiple independent measures; Bonanno's teams are pioneers in using mixed methods longitudinal research to increase our understanding of resilience. A prolific researcher and writer since his initial work in 1994, Bonanno's ever-evolving complex collaborative view of resilience consistently notes resilience is the most common response to trauma, loss, and grief. This portfolio of research adds further legitimacy to some of the developmental research (such as Masten's 'ordinary magic') to inform our understanding of adult populations, and contributes to adult resilience research which in turn further strengthens the argument that resilience is the norm following PTEs.

Bonanno's model of resilience

Mancini & Bonanno (2009), developed a model of resilience that has turned the exploration of resilience upside down by noting that psychopathology cannot be understood nor effectively managed without a clear and deep understanding of resilience and health. This may appear to be an inversion on the traditional dichotomy of views about resilience unless health is understood as a multidimensional helix as described in chapter 2.6.c of this thesis; there is no 'continuum' between illness and health – health is a concept that lives within the helix and can be influenced at multiple access points. Mancini and Bonanno's perspective

links to nursing and Florence Nightingale's counsel to 'study the well' in order to better understand disease/illness (Nightingale, 1851). Mancini and Bonanno's model also links to 'health promotion', the process that enables people to define and exert control over their own health and health capacities. This link is evident in Mancini and Bonanno's exploration of the inter-relationships between cognitive appraisal (self-assessment of the impact of the loss), social support (the availability and utilization of social resources), and various internal and external coping strategies (i.e. flexible utilization of strategies, optimism, positive attitudes, etc.) in the context of resilience and loss.

Bonanno currently sees resilience as a broad umbrella concept that overarches multiple elements that are related temporally and contextually hence cannot be understood separately from one another (Bonanno, Romero, & Klein, 2015). Resilience has multiple 'trajectories' that are at times unexpected yet adaptive such as repression, self-enhancement, laughter, etc. (Bonanno, 2004), and there are notable differences between populations (children/adults) and interpretations of experiences giving rise to resilience (chronic/acute stressors) (see for example: Bonanno, 2005, 2006; Bonanno, Brewin, Kaniasty, & La Greca, 2010). Bonanno (2012) views resilience as an outcome but his complex models of resilience with links to health promotion and with multiple trajectories, heterogeneous responses, and view of resilience as an overarching concept leads me to view resilience as both an outcome and a process. Bonanno's model is discussed again in section 8.12.a.

Bonanno does not endorse an expectation that people will grieve or deal with trauma in particular ways such as crying or reliving the experience, and criticizes those who 'swoop in' post-incident to try to fix victims (2006). My sense is that this stance comes from those in the field who impose external coping strategies on 'patients', assuming that people are traumatized and in need of help; rather, the stance should be one of health promotion and inquiring, listening, exploring individual and collective strengths and capacities (which may include crying, talking, etc.) that are 'ecologically correct' (meaning congruent with values, beliefs, culture, environment, and which are adaptive) for the individual. This requires suspending one's expectations that there are 'good' or 'bad' ways to deal with trauma or grief; not an easy stance to take when many of us in the field have expected outcomes in

mind that stem from our own epistemological and ontological perspectives rather than a client-centred perspective.

It is Bonanno's research on resilience in multiple populations, age groups, cultures, and events that provide direct relevance to firefighter research – adult populations, various ages, the culture of the FRS, and experience with 'tough calls'. Persistent and repetitive themes in Bonanno's research include: heterogeneity of responses to traumatic events (2004-2015); *emergent resilience* to chronic adversity vs. *minimal impact resilience* after acute adversity (2007-2015); need for complex, integrated, multidisciplinary approaches for research and theory (2009-2015). Bonanno consistently articulates the view that resilience research requires scientific rigour including 'measurable' outcomes and longitudinal studies echoing other researchers (Masten, 2015; Ungar, 2008).

I would say that Bonanno's extensive body of work has been most influential in my understanding of, and continued interest in, resilience particularly in the context of firefighters who are generally psychologically healthy adults despite facing ongoing "acute life events" (Bonanno & Diminich, 2013, p. 380) also referred to as PTEs. Bonanno's focus on 'minimal impact resilience', defined as "a stable trajectory of healthy functioning before and after the event" (Bonanno & Diminich, 2013, p. 382) is most closely related to the context of firefighters in contrast to the developmentalists (i.e. Masten, 2001) who have focused on resilience in child survivors of chronic adversity; although there is much knowledge to be gained from the developmental perspective, it does not contextualize well to reasonably healthy adult populations facing repeated PTEs. Bonanno and Ungar have also been most influential in moving my understanding of resilience as something other than a simplistic 'state or trait' conceptualization to one that is more systemic and includes individual and cultural components.

3.3.l   Fletcher and Sarkar's Theory Of Resilience In High Performance Athletes

In the literature more recently, Fletcher and Sarkar's work with high performance athletes (2013) seems analogous to firefighters; volunteer firefighters and Olympic athletes are required to withstand multiple complex stressors in the performance of their 'job' including but not limited to: dealing with public scrutiny, remaining focused in the face of distractions,

and being committed to ongoing learning and improvement through practice, external critique, and internal reflection. Fletcher and Sarkar define resilience as: "an overarching concept that encapsulates stressors, cognitive appraisal and meta-cognitions, psychological factors (positive personality, motivation, confidence, focus, perceived social support), and facilitative responses" (p. 672). Fletcher and Sarkar (2012) discovered that multiple factors including cognitive appraisal, personal factors such as optimism, and social support are key concepts in the construction of their theory of resilience in high achieving athletes; these factors are common with findings with various other researchers (see for example: Almedom & Glandon, 2007; Bonanno et al., 2011; Masten, 2015) particularly in relation to social support and flexible coping mechanisms. Recurrent themes in firefighter research (see for example: Blaney & Brunsden, 2015) that parallel Fletcher and Sarkar such as social support, optimism, flexible coping, etc. further link athlete and firefighter models of resilience.

Although there are a number of dimensions to Fletcher and Sarkar's theory in contrast to more linear representations of resilience (see for example: de Terte et al., 2008; Richardson, 2002), I suspect that within the context of volunteer firefighters there are even more dimensions, concepts, and inter-relationships – which will be elucidated in chapters seven and eight of this study. Of note in Fletcher & Sarkar's argument (2013) are their descriptions of several flaws in Richardson's model (2002) including its linearity; single dimensional unidirectional models seem to be common in the literature despite recognition of multiple influences on resilience. Fletcher and Sarkar also suggest Richardson's model and its "bias toward coping-oriented processes" (p. 17) diverts researchers from fully examining the robust nature of resilience; they suggest resilience and coping must be considered "conceptually different constructs" (p. 17) in order to further the understanding of resilience. Certainly in this thesis, resilience is viewed as the overarching concept, with 'coping' being a sub-category within a resilience system as noted in the previous chapter.

3.3.m de Terte and a Model of Resilience in Police Officers

Ian de Terte and colleagues (2014) developed a theory of resilience in police officers depicted by a five stage representation and modelled on the 'five areas approach' (Williams & Garland, 2002) of cognitive behavioural therapy. Operating from the perspective of resilience as: "the ability of an individual to recover from a traumatic event or to remain

psychologically robust when faced with an adverse event" (de Terte, Stephens, & Huddleston, p. 416), de Terte et al.'s model initially articulated interactions between five components of resilience: thoughts, feelings, behaviours, physical activities, and environment. However, in testing the model in police services over a number of years, categories within the model such as emotional intelligence did not appear to contribute to resilience as expected; the reasons for this were not communicated. Ultimately, de Terte et al. conceptualize their model as a three part bidirectional interactional archetype of resilience (cognition, environment, and behaviours combine to build resilience). The strengths of this model are in its multidirectional and multidimensional aspects, and in the recognition of the utility of specific components such as social support and personal coping strategies (constructive health practices such as exercise, mental models such as optimism), etc. The limitations of the theory include its linear depiction, and the study also highlights the need to test the model across other high-risk professions such as FRS and with 'communities' or groups as well as individuals. In response, this programme of research was catalysed in part by de Terte et al. and the need to compare/contrast de Terte et al.'s model with resilience in the FRS.

3.4   SUMMARY OF PERSPECTIVES OF RESILIENCE

When comparing and contrasting the definitions of resilience from these leaders it seems initially as if there are more differences and dichotomies, and little in common. However, Southwick, Douglas-Polumberi, et al. (2014) notes that resilience is not binary, static, nor exclusive to any discipline but is multifaceted, dynamic, contextually-bound, and has bio-psycho-socio-cultural characteristics; it is a complex concept requiring pluralist understandings and explorations as evidenced by the perspectives above.

I recognize that this summary of the literature is a very reductionist approach in order to synthesize and present salient ideas, and this is by no means a comprehensive list of leaders in the field of resilience; it is a representation of those who have most influenced my evolving understanding of resilience. This is not to ignore concepts of developmental psychology or medicine nor to ignore mental illness as a possible outcome to adversity but to follow in the footsteps of those who see resilience as the most common outcome following trauma. Rather than limiting myself to the more common understandings of resilience as

the absence of psychopathology such as post-traumatic stress disorder, depression, burnout, etc., I was looking at those researchers who have discovered or approach resilience using a 'health' lens, and I'm beginning to see an evolution beyond psychopathology in some of the more recent literature. It is clear from the literature that resilience remains an evolving concept that, even for those who have studied resilience for years, goes well beyond the simple absence of psychopathology and is dynamic, complex, health-oriented, and mediated by multiple factors. A summary of key conceptualizations are contained in a table-format as Appendix I.

This section of the thesis has discussed how researchers have, and continue to, conceptualize resilience in the literature. The complexity of the construct and the evolving understanding of resilience is evident, as are various perspectives of resilience in, primarily, developmental contexts which do not seem easily transferrable to the firefighter context. The following section will discuss some of the theoretical underpinnings to resilience.

3.5   CONTEXTUAL UNDERSTANDINGS OF RESILIENCE - A CRITIQUE OF THEORIES AND CONTRIBUTING FACTORS

3.5.a   Theories

How resilience is conceptualized is often rooted in the overt disciplinary values/beliefs/epistemologies/ontologies of those exploring resilience. A large body of the resilience literature focuses on children and adolescents, but a search of the literature in the databases noted earlier in this chapter yielded an increasing number of perspectives on resilience in various age ranges and across occupations. There are however few studies on resilience in high-risk occupations, and fewer still on resilience in volunteer firefighters.

Metatheory

Richardson's (2002) metatheory of resilience reviewed three 'waves' of resilience research, noting resilience theory does not spring from pure science but from the phenomenological experiences of those who have lived through and in many cases grown from adversity. There have been criticisms of Richardson's theory as too linear, and not relevant to those who experience multiple stressors/exposures (see for example: Fletcher & Sarkar, 2013).

Resilience as the common outcome to adversity

Bonanno and his teams have focused on survivors of the 2001 World Trade Centre disaster (see for example: Bonanno, 2006; Bonanno, Galea, Bucciarelli, & Vlahov, 2006; Bonnano, Rennicke, & Dekel, 2005) and adults who are bereaved of a spouse (Bonanno, Moskowitz, Papa, & Folkman, 2005), while other researchers have recently focused on nurses, police, and military (Warelow & Edwards, 2007; Paton et al., 2008; Adams et al., 2010). Bonanno's theoretical renderings of resilience across contexts has relevance to volunteer firefighters (i.e. in the exposure to acute potential trauma) but there remain significant gaps in our understanding of resilience in the FRS, most particularly the volunteer sector given the dearth of research on this population. As well, the specifics of the psychological effects inherent in specific occupations such as emergency services has been the subject of debate across disciplines (see for example: Antai-Ontong, 2001; Barkway, 2006; Luthans et al., 2006; Nucifora et al., 2007; Wright, 2003); overall there is agreement that first responders are in high-risk professions but there is no solid evidence about best practices for mitigating the psychological risks. However, resilience is clearly implicated in mental health and this research addresses the gap in literature relative to resilience to volunteer firefighters; understanding resilience in this context is foundational to establishing best practices for mental health in the FRS.

Historically the variables of interest in stress research have been risk, vulnerability, illness or disease such as *post-traumatic stress disorder* or PTSD (see for example Bryant & Harvey, 1995; Garmezy, 1971; Masten, 2012; Wagner et al., 1998) using randomized controlled trials to explore the illness trajectory; this dominant illness paradigm pervades the literature and may be useful for those who provide disease treatment, but does not address the evidence of reasonably low incidence of PTSD in emergency services (Del Ben et al., 2006; Haslam & Mallon, 2003) and the coping capacities of firefighters, nor does it address the dearth of literature on resilience in high-risk professions. Despite calls for paradigmatic shifts to re-look at resilience as more than the simple absence of psychopathology and to consider cross-disciplinary, strengths-based, positive language and theory (Murphy, Durkin, & Joseph, 2011), strong research links to *illness* and *pathology* continue to imbue resilience studies.

The journey to conceptualization of resilience

Researchers note resilience is not simply the absence of psychopathology, but a broader, deeper concept; Tusaie and Dyer (2004) suggest that resilience research requires that a dynamic interactive approach be taken, and Richardson (2002) notes that the stress research paradigm has shifted from a reductionist, problem-oriented approach to one that is focused on nurturing strengths. Although there is some literature on emergency services and disaster stress subsequent to 9/11, much of it focuses on risk factors for disease; there is little research on stress and resilience in high stress occupations, and no cross-sectional analysis of resilience across high risk professions. Bonanno (2004) suggests that we have underestimated the resilience capacity of people, including firefighters, to survive and thrive in the aftermath of trauma. There have been increasing calls for studies whose variables of interest include health, resilience, and coping (Atkinson, Martin, & Rankin, 2009; Bonanno, 2004; Jeannette & Scoboria, 2008; Seligman & Csikszentmihalyi, 2000) with theoretical drives that consider factors from other perspectives such as phenomenology, grounded theory, and mixed methods. These perspectives compel us to look further at the phenomenon of resilience, and to explore methods of building/enhancing resilience particularly in high-risk occupations. Importantly, Figley, on his open access blog about his evolving work with military medics, calls for "a paradigm shift from illness, disorder, and psychopathology toward recovery expectancy, resilience, thriving, and even prosperity" (2010, para. 1); this perspective supports other recent work with emergency services personnel that suggests alternative paradigms to illness are needed to ascertain how firefighters and other emergency service providers survive, thrive, and are retained within high-risk professions (Blaney, 2009; Bonanno, Brewin, Kaniasty, & La Greca, 2010; Halpern, Maunder, Schwartz, & Gurevich, 2012; Regehr, 2009). Figley (2010), and Bonanno (2005, 2010) insist on the need for increased research into resilience across multiple contexts and events, research which again is lacking yet underpins development of evidence-informed occupational health policy and practice.

3.5.b   Factors Implicated In Resilience

There is strong support in the literature suggesting that multiple factors contribute to

resilience and that resilience can be enhanced. For example, Fredrickson and Losada (2005) are among authors who suggest that positive emotions can enhance resilience. Masten (2001) suggests that enhancing resilience requires promotion of personal competence, as well as prevention of distress; 'enhancement of assets' is a common theme in Masten's thesis and suggests that resilience can be learned. Noblet and LaMontagne (2006) suggest cultural factors such as workplace health promotion can enhance resilience, and Warelow and Edward (2007) suggest that 'caring' as a philosophical underpinning within occupations can also enhance resilience. Bonanno et al. (2004) note 'flexibility' contributes to resilience and asserts that adaptive flexibility can be taught. A 'sense of coherence' (Antonovsky, 1996), hardiness (Maddi, 2005), and social context (social support, work culture, etc.) have all been implicated in defining and enhancing resilience (see for example: Chopko & Schwartz, 2009; de Terte et al., 2008; Hobfoll, 2014; Kaminsky, McCabe, Langlieb, & Everly, 2007; Lazarus & Folkman, 1984; Lester, 2013; Paton, Smith, & Stephens, 1998; Pender, Murdaugh, & Parsons, 2011; Regehr, 2009; Shakespeare-Finch, 2011; Tehrani, 2011). More will be said about the multiple factors that contribute to firefighter resilience in chapter eight.

There are two main approaches to enhancing resilience to workplace stress – personal, and organizational (Noblet & LaMontagne, 2006). The literature on improving individual resilience notes the effectiveness of resources such as humour, exercise (Cotman & Berchtold, 2002; Erickson et al., 2010; Southwick, Douglas-Plumberi, et al., 2014b) as well as mindfulness, cognitive flexibility (Bonanno, Pat-Horenczyk, & Noll, 2011) and many other mechanisms that can be learned and activated with the intent of enhancing individual resilience. Maunder et al. (2008) describe a combined approach that targets individual resilience through education and mental health first aid training, as well as organizational leadership and the creation of an organizational culture of resilience (Fleming & Ledogar, 2008); Bartone (2006) also notes the role of leadership in facilitating resilience. Within the literature, there does not appear to be a clear link between definitions and theories of resilience to methods of enhancing resilience; when describing how to enhance resilience, much of the enhancement literature seems to 'assume' a definition that may or may not be explicated hence there does not appear to be a strong foundation upon which to build resilience. However, Yehuda et al. (2013) suggests it is time to move beyond the definitional

debate and to focus on actions that enhance resilience. One of the contributions of this programme of study is in the link between the definition of resilience and the construction of the theory of resilience in volunteer firefighters; this in turn provides a foundation from which to develop policy and best practices.

As well, there has been criticism of programs offering resilience education because a) they do not define the construct and context of resilience; b) they do not have standardized outcomes or outcome measures; and c) few models are informed by available research evidence (Gilbert & Bilsker, 2012). However, the Mental Health Commission of Canada (MHCC) (2013b) has developed a standard of psychological health in the workplace, as well as a guide for prevention, health promotion, and implementation of the standard that includes templates for outcome statements and evaluation processes; this document moves beyond the definitional debate and can serve as a template for resilience and other mental health promotion programs in a variety of workplaces. These factors will be further discussed and linked to firefighters in the next section.

3.6 ASSUMPTIONS ABOUT RESILENCE WHEN UNDERTAKING THIS THESIS

Much of the literature depicts resilience as a linear 'concept' that opposes psychopathology. For the purposes of this research, and as a result of my review of others' definitions of resilience, I initially operationalized *resilience* as: an 'umbrella' health concept that overarches a constellation of multidimensional and multifaceted definitions and contexts; the umbrella is underpinned by salutogenesis, and requires pluralism of investigation and interdisciplinary collaboration. As the programme of study unfolded though, my definition of resilience also evolved as will be explained in section 7.5 of this thesis. However the start point of the research hinges on a definition that incorporates a multidimensional multifaceted overarching concept that is underpinned by salutogenesis.

3.7 FIREFIGHTERS AND HEALTH PROMOTION

Changing focus slightly in this review, attention turns specifically to firefighters. Previous research remarked on firefighters' interest in health and coping, and recommended re-contextualizing the concept of occupational stress into a 'health promotion' theoretical framework (Blaney, 2003, 2005). It was noted that this health perspective, in contrast to the

illness/pathology orientation in the literature and in practice, was shared by firefighters across several countries. Research suggests firefighters are less-than-enthused about talking about 'illness' (i.e. post-traumatic stress disorder) but willingly describe 'what works' to keep them healthy: engaging with social networks such as teammates or friends/family and talking about stress and coping; utilizing personal resources such as exercise, meditation, journaling; and making meaning of events such as attributing spiritual or practical connotations to events, memorializing victims, etc. (Blaney, 2003, 2006; Brunsden, Hill, & Maguire, 2012; Jeannette & Scorboria, 2008). Firefighters clearly articulate their perceptions of what is most helpful and what is least helpful for decreasing distress post-incident: talking, activating personal resources, etc. are helpful, but attempts by outsiders or management that are perceived to be insincere or mandated cause an increase rather than a decrease in post-incident stress (Blaney, 2009; Jeanette & Scoboria, 2008; McMahon, 2010). Firefighters are overwhelmingly supportive of peer-led Critical Incident Stress Management (CISM) programs (Durkin & Berkerian, 2000; Lawrence & Barber, 2004); outcomes explicated CISM as a framework for a service matrix that includes pre-incident stress education, group intervention immediately following a traumatic event, and referral for longer-term mental health care if needed (Blaney, 2009; Hawker, Durkin, & Hawker, 2011). Also country and 'trade' differences (between volunteer and career members in particular) have been found in the perceptions of critical incidents and in preferred coping strategies; for example, Canadian firefighters chose 'exercise' and verbal ventilation as primary coping strategies while UK firefighters found that humour and bringing forward one's 'experience' and attitudes of professionalism and pragmatism were necessary to cope effectively post-incident (Blaney, 2005, 2009; Blaney & Brunsden, 2015). Career firefighters in Canada (Blaney, 2003) and the UK (Blaney, 2006) identified the death of a child and large, 'gruesome' events as most distressing, whereas volunteer firefighters identified on-scene fatalities and knowing the victim as the most critical events – these differences are relevant to firefighter perspectives of resilience and coping, and in the development of resources to enhance resilience in order to ensure contextual and cultural perspectives are represented in both research and 'intervention' programs.

3.8   STRESS AND COPING IN THE FRS

Firefighters are considered to be at high risk of negative physical and psychological outcomes

to their jobs because they routinely face risks and work in conditions that are beyond the norm of most occupations and trades (Blaney, 2003; Brunsden et al., 2012).

Chamberlin and Green (2010) note the agreement among researchers and firefighters that there are indeed risks associated with firefighting as an occupation and suggest that firefighters *may* be at increased risk of developing posttraumatic stress disorder although there is inconsistent evidence to support this conclusion (see for example: Chamberlin & Green, 2010; del Ben et al., 2006; Haslam & Mallon, 2003; Jeannette & Scoboria, 2008; Regehr et al., 2003). As well, the authors also note there is little agreement about the risk factors for occupational stress which in turn challenges our understanding of effective coping strategies. Chamberlin and Green's work showed inconsistent relationships between higher levels of occupational stress and factors such as age, experience, education, and differences in chosen coping strategies (seeking support, exercise, information processing, etc.) between recruit and experienced firefighters although both groups used humour and acceptance frequently to cope with work-related distress (Chamberlin & Green, p. 554).

Jeannette and Scoboria (2008) noted that firefighter stress has been linked to the firefighter's appraisal of an event and the degree to which the event challenges the worldview or 'schemata'; social support is an essential mediator for 'reintegration' or re-establishing a shattered worldview and these authors find that critical incident stress management (CISM) programs help maintain and/or re-establish social support networks post-incident.

Brown et al. (2002) investigated, among other concepts, the associations of work-related stress and coping in firefighters in Northern Ireland. These authors found differential associations with emotion-focused, task-focused, and avoidance-focused coping and levels of distress; avoidance coping was common and resulted in greater distress. Brown et al. suggest that firefighters would benefit from coping skills training in emotional expression, anger management, and relaxation training.

There remains controversy about how to address occupational stress with a bias towards studying distress in the context of the disease of *post-traumatic stress disorder* (PTSD).

However, researchers are now looking beyond the illness context and the simple absence of pathology, and viewing occupational stress, trauma, and critical incident stress through the lens of *health*, with a focus on factors such as resilience and coping (Bonanno, 2004; Hobfoll, Stevens, & Zaulta, 2015; Mental Health Commission of Canada, 2013a). Johnson's (2010) seminal study of career and volunteer firefighters found that there were similarities in levels of stress, perceptions of stress and in coping strategies between the two sectors. These findings are relevant to overall resilience research, and to research with firefighters because the outcomes can begin to inform occupational health programs, and is in keeping with the findings of this thesis that notes that education is a core category of resilience.

As the programme of study evolved, it became evident that 'coping' is a loosely-used term with a variety of assumed meanings (see chapter 2.7). Within the literature generally, 'coping' is used as a verb and refers to *action* – the efforts made to manage specific demands that are appraised to be threatening (see for example: Chamberlin & Green, 2010). Coping strategies differ from resources in that coping is the activity, and resources are the assets that enable the activity. Therefore, in order to cope, firefighters require strategies or resources to enable the action; it is the access to, and utilization of, these resources that partly contribute to resilience (see for example: Hobfoll, 2014; Ungar, 2008). As a result of the research methods (concurrent data collection and analysis, constant comparison, etc.) in this programme of study, it also became evident that firefighters moved beyond the discussion of coping, and spontaneously began using the term resilience; ultimately the definition of resilience emerged as a dynamic *system* of interactional pathways that are "socially constructed and culturally bound" (Berger, 2016, p. 7). Within this study's definition of resilience, coping is a sub-category within the core category of personal resources, which highlights the fore-fronting of resources in order to action coping.

As well, Berger (2016) finds that coping is part of everyday life whereas resilience is evident only after adversity, and after people have incorporated the adversity into their life narrative. As this programme of study evolved for example, *meaning-making* became evident as a core category of firefighter resilience, offering another context for Berger's conceptualization of resilience as more than simply 'coping'.

Although there is agreement that the FRS is a high-risk profession due to potential stress-related disease outcomes, there is little understanding of how stress is conceptualized in the FRS. As well, there is inconsistency in opinion on how firefighters 'cope' with stress and on strategies that aid coping. As well, there are assumptions but little clarity in the literature around the definition of coping. This programme of study moves beyond stress and coping in the FRS and explores resilience because I do not see 'coping' as synonymous with resilience yet 'resilience' is a term that has been used by firefighters in previous research (see for example: Blaney & Brunsden, 2015). However, given the disparate definitions of resilience in the literature it seemed prudent to begin this research programme with an exploration of firefighter stress, stressors, and coping strategies to see if 'resilience' would resurface and offer a platform for exploration in the current context and culture. This, in fact, did occur - questions related to stress and coping elicited spontaneous references and explanations of resilience and allowed the programme of study to move from 'coping' into a broader context of resilience (this will be further discussed in methods and findings in chapters six and seven).

3.8.a   Critical Incident Stress Management (CISM) in the FRS

A stress management programme that is used in many FRS in Canada and the U.K. is *Critical Incident Stress Management*, or CISM (Blaney, 2005; 2009; Everly & Mitchell, 1999; McNally et al., 2003), also known as *Trauma Support Program* (TSP) in some jurisdictions in the U.K. (Lawrence & Barber, 2004). CISM is a comprehensive system with prevention, intervention, and post-vention components: prevention includes pre-incident education; intervention includes group defusing, debriefing, and other post-incident tools; and post-vention includes family education and referral for follow-up mental health services when necessary. In the context of Canadian and English fire and rescue services, CISM is peer-led and aims to bolster resilience (Blaney, 2009; Blaney & Brunsden, 2015). While one aspect, *debriefing*, has met with criticism in some quarters others have noted that these criticisms are largely based on flawed evaluations (see Brunsden et al., 2012; Hawker, Durkin, & Hawker, 2011). More holistically, a meta-analysis has supported the efficacy of CISM in relation to trauma (Everly, Flannery, & Mitchell, 2000) and the intervention component of CISM was offered as a standard of practice to individuals exposed to the trauma of the 2001 World Trade Center attack (Miller, 2002). When viewed through a health-promotion lens, CISM with its inter-

related components fits clearly into a health orientation through its focus on education about: 'normal and expected' human stress reactions for firefighters and family members, social support in the form of group conversations led by peers within the fire services, liaison with mental health services to ensure awareness for both firefighters/families of availability and accessibility of services; CISM education directed towards mental health professionals ensures they are aware of the adaptive processes (Ellis, 2015) of firefighters in order to prevent pathologizing ecologically correct responses to potentially traumatic events.

Other research suggests that CISM is an effective vehicle for mitigating job-related stress and enhancing resilience in firefighters (Blaney, 2005, 2009; Boscarino, Adams, Foa, & Landrigan, 2006; Jeannette & Scoboria, 2008; Miller, 2002). More specifically, firefighters in both Canada and the UK are of the opinion that social support is an important stress management tool, and that peer-led CISM is an important source of social support. This is in keeping with Deahl and Bisson (1995) who concluded that a good support network may be sufficient as a primary coping strategy for the majority of emergency personnel exposed to work-related trauma; social support has consistently been shown to be a key factor in resilience (Halpern, Gurevich, Schwartz, & Brazeau, 2009; Jackson, Firtko, & Edenborough, 2007). Firefighters' perspectives (Blaney, 2003, 2009) about the utility of education/information pre- and post-incident parallel findings from other contexts (Bonanno, 2005; Chopko & Schwartz, 2009; Maddi, 2005; Youssef & Luthans, 2007) about the necessity for context-specific knowledge development and dissemination.

Although there are minimal reviews in the context of firefighters, the existing evidence supports the implementation of comprehensive stress management programs (Feldbush & Mitchell, 2010; Kaminsky et al., 2007; Paton et al., 2008) delivered as a *matrix* of services and support (rather than a single intervention); this is a model that has been previously endorsed by firefighters (Jeannette & Scoboria, 2008) and others working in high-risk professions (see for example: Adler, Litz, et al., 2008; Hawking, Durkin, & Hawking, 2011) and is in keeping with recent literature on resilience looking at the influences of social, cultural, and health factors.

3.9   CHAPTER SUMMARY

This chapter has reviewed definitions of resilience, and discussed how resilience is constructed/viewed by theorists and practitioners. Definitions of resilience are wide and varied, but generally have two main components: adversity, and 'bounce back' from adversity. Resilience does not seem to exist in the absence of adversity but adversity is relative to individuals, contexts, and cultures so the definition of resilience must be broadened and tested across contexts. The literature reviewed how resilience was conceptualized initially by developmentalists, and noted how the understandings of resilience have moved from the simple absence of psychopathology in children faced with adversity to our current knowledge that resilience is a complex dynamic construct that exists across contexts. The debate over resilience as trait or state has been touched on but given my work in nursing I came into the research with an understanding of the concept that was already beyond the state/trait debate; it was my bias that resilience is not a static personality trait but a dynamic concept that can be learned and enhanced, a view that is supported in the evolving literature.

The study of psychological resilience has evolved from a number disciplines and approaches such as developmental perspectives and research into children facing chronic adversity yet experiencing the absence of psychopathology (see for example: Masten, 2001), and exploration of cultural practices that enhance resilience in areas of global conflict (see for example: Panter-Brick, 2014). Current perspectives are beginning to offer views of how resilience manifests itself in adults exposed to acute stressors in various contexts and cultures, such as the emergency services (see for example: de Terte & Stephens, 2014) but significant gaps in understanding resilience in the FRS remain; this programme of research aims to provide greater depth and breadth to the conceptualization of resilience in volunteer firefighters.

Because of the complexity of the construct and our tendency to try to simplify it, there are other limitations in the literature to date such as the focus on resilience as an illness construct situated at one end of an illness/health continuum. Going forward, resilience research must take a broader view of health in order to better understand resilience as more than the absence of pathology. As well, studies have tended to focus on either qualitative or

quantitative approaches to understanding resilience; the literature notes the need for more robust research and calls for longitudinal mixed methods which are beginning to occur despite the logistical challenges of these research projects. More will be said about methodology and methods in chapters five and six.

This chapter highlights the synergy between the literature on factors that contribute to resilience and the health practices of firefighters (i.e. social support, exercise, education). The FRS has existing structures (culture, leadership, social support) and resources (i.e. CISM, personal and collective resources) that are known to support resilience making this opportunity for further study far too intriguing to pass up. The context is volunteer firefighters who routinely face PTEs yet need to be resilient; there is a dearth of research with volunteer firefighters. The research questions in this programme of study relate to the 'how' of firefighter resilience (firefighter perceptions of PTEs, reactions to stressors, coping with reactions) in order to set the stage for construction of resilience theory; as well firefighter definitions of resilience contribute unique context to understanding the experience with resilience which may or may not relate to the existing literature on resilience. Finally, construction of a theory of resilience in volunteer firefighters is imperative since much of what firefighters 'do' in response to PTEs is seen in the literature as generally contributing to resilience, but there is no evidence clearly aligning those factors in the firefighter context.

In summary, there are no clear definitions of resilience in volunteer firefighters, and perceptions of stress, stressors, and coping in the volunteer FRS are not evident in the literature; understanding these concepts is foundational to clarifying and/or developing the construct of resilience in volunteer firefighters. This programme of study is designed to address these gaps.

CHAPTER 4: CONTEXT OF THE STUDY

4.1   OVERVIEW

[At the staffed/career fire hall] when the call comes in and the alarm goes off, the firefighters on staff at the hall hop on the trucks and respond to the fire. With a volunteer department however the entire department is at home living their lives when the call comes in. Dispatch will issue a call and every firefighter's pager will go off followed by the dispatcher explaining a basic outline of the emergency. From that moment on a well-rehearsed dance takes place in the homes of the many volunteer firefighters across town. Dinners are dropped, sleep is abandoned, clothes are thrown on, kids are dropped off with neighbors, special events are interrupted, plans are abandoned, and the firefighters jump into their vehicles and race for the hall. They know too well that seconds matter, and they shave as many as they can off their response time on their way out the door. They do this with no idea how long they will be gone. A call can last twenty minutes, or a call can last 18 hours. For the volunteer firefighter, life outside the call simply stops for that stretch of time. For their family, life goes on in their absence. It takes a lot of character to devote oneself to being a Volunteer Firefighter…these firefighters actually volunteer to live a certain lifestyle. Plans are made with the possibility of a call coming in at the back of everyone's mind. Snacks are left in vehicles in case a call comes in before a meal so the firefighter can have a quick bite to eat if need be. A quick change of clothes and the car keys are always handy in case of a middle-of-the-night call. Back up child care is always at the ready in case of a call…They knowingly take great risks, give up time and freedoms, and choose at times to put their family second in order to help another family in need. Think about their families who are often fiercely supportive of this lifestyle and the commitment they too demonstrate to the position… [this] is the true nature of our volunteer firefighters and departments…

Schellenberg, 2011.

This chapter describes the FRS in the province of British Columbia (BC), Canada, and compares and contrasts career and volunteer FRS in BC to provide context for the specific FRS participating in the study. Community demographics, and an overview of the call volume and types of calls that the FRS responds to, will offer a snapshot of the critical relationship of the FRS to the community and its residents. The roles and responsibilities of the firefighter will be described, as will the changing face of the FRS in this community that is mirrored by the changes to FRS globally. A brief overview of the supports that are in place for firefighters in this FRS will be provided.

4.2   LOCATION OF THE STUDY

British Columbia (BC) is Canada's westernmost province, with a population of approximately 4.6 million and geographic area of 944,700 square kilometres (sq. km) or 364,750 square miles (sq. mi). The largest city in BC is Vancouver and nearly 2.5 million people live in the greater Vancouver area, 54% of the province's population. These details are important in illustrating that there are vast land areas in British Columbia and a relatively small population occupying the province outside of one fairly densely populated space. Across the Salish Sea (formerly the Strait of Georgia), 17 km from Vancouver is Vancouver Island, a land mass of 32,130 sq. km (12,000 sq. mi), and home to 749,000 people. Vancouver Island is 460 km (290 mi) long and 80 km (50 mi) across at its widest point, again, a large area of land populated reasonably sparsely; overall there are a multitude of small communities (municipalities such as villages, towns, districts, and cities, as well as regional districts and improvement districts) spread across the Island. Each community has some form of local government authority (LGA) such as elected mayor and council, as well as a variety of responsibilities and revenue-generating schemes (local property taxes, fees for services, provincial and federal taxes and grants, etc.). LGA is a generic term adopted for the study but does not differentiate between the 'type' of governance (i.e. town/city council, regional district, unincorporated improvement district, etc.). The local government authority is responsible for protection services including fire; operating costs for FRS are the responsibility of the residents of the municipality and are usually funded through municipal taxes.

The resource-based economy of Vancouver Island that has relied on forestry, mining, and fishing for over a hundred years has seen a significant downturn in the past two decades; tourism, eco-tourism, and the 'tech' industry are the new economic drivers on Vancouver Island. Many of Vancouver Island's younger workforce has left (temporarily or permanently) to work in other provinces that have resource-rich economies such as oil and gas, mining, etc. and/or whose communities require infrastructure development (such as new home construction) in order to effectively manage the resource. The changing demographic on the Island has resulted in changes to average income and tax base of communities, decreased volunteerism, and a shift away from what used to be a multi-generational population in communities to one that is much more transient hence less engaged with community.

The LGA is responsible for deciding the need for, and level of, FRS but there is no legislative requirement for communities to have fire services. One of the main issues facing FRS is budget – there are limited finances for operating costs of FRS, and very little money for training. When surveyed in 2009, FRS in BC identified the following priority challenges: training; volunteer recruitment and retention; funding; gaps in service – lengthy response times in rural/remote areas of the province; and increasing call volume of medical aid responses with no increase in funding for this specialized service (Fire Services Liaison Group, 2009). Emergency medical first response from the FRS are core expectations of most LGAs and citizens despite the existence of a province-wide emergency health (ambulance) service. FRS first responders have a number of critical responsibilities when called out and whilst awaiting the arrival of the ambulance; despite these responsibilities, fire service medical aid funding from the province in 2009 was $0.67 per capita compared to $68.67 per capita for ambulance service (Fire Services Liaison Group, 2009).

Vancouver Island's climate is temperate rainforest with hot dry summers; snow is rare except high in the mountains. With significant rural areas replete with old growth and new growth forests, interface fire is a high risk for much of Vancouver Island, particularly in the dry summer months.

Geography, climate, changing demographics to communities requiring people to work away, budget concerns from a decreasing tax base, the time commitment required for FRS training and calls, and decreased volunteerism are just a few of the challenges facing residents of BC and Vancouver Island, and the volunteer fire services in particular.

4.3   THE FIRE RESCUE SERVICES OF BRITISH COLUMBIA

There are approximately 350 FRS in BC (Fire Services Liaison Group, 2009); 180 are based in municipal and regional districts, and 170 are directed by unincorporated societies or unincorporated improvement districts. Additionally, there are over 100 airport, industrial, and First Nations FRS whose governance differs from those 350 municipal FRS. Volunteer FRS make up over 75% of BC's fire services (Fire Services Liaison Group, p. 20). The responsibilities of FRS are to protect communities (people and structures) from fire, provide

medical first responder and highway rescue services, provide interface fire services to the province, and be aware of and to be involved in provincial disaster response (despite limited consultation from the province to local jurisdictions and no extra funding from the province).

There are an estimated 14,000 firefighters in BC. About 4000 (Fire Services Liaison Group, 2009) are 'career' firefighters, defined as those who make a career of a trade, and known as 'wholetime' firefighters in the United Kingdom (UK). There are over 10,000 'volunteers', 'auxiliary', or 'paid on-call' members in BC: those who do not make a career of firefighting and who in the UK are known as the 'retained duty system' or RDS. In Canada, the terms volunteer, auxiliary, and paid on-call are often used interchangeably within communities, but naming is a sensitive issue and there are various preferences. There are a number of iterations of volunteer, on-call, and auxiliary firefighters with some being members of all-volunteer FRS while others are members of 'composite' departments (a combination of career and volunteer members). In composite FRS, the volunteer members of the department are assigned to specific stations within the department and may work alongside career members or may be assigned on-call to stations that are not crewed 24 hours/day.

In wholly volunteer FRS, generally the volunteer firefighter carries a pager and receives no compensation for being on-call but does receive remuneration once they are paged out to a situation. Remuneration varies between departments, and is usually an hourly rate ($8-$20/hour) for call-outs, and either an hourly or a 'flat rate' for practice/training nights with a 2-hour minimum (i.e. $14/hour x 2 hours, or $25 flat rate each training night). There is often tension between the career and volunteer members within a fire department, and between career and volunteer FRS in adjacent geographical areas. As an aside, many members of career departments are recruited from the volunteer departments; often the volunteers have been trained to a professional standard and are experienced at responding to a variety of incidents so are able to integrate quickly into the career FRS.

4.4   CONTEXT OF THE FRS INVOLVED IN THIS STUDY

Prior to the start of data collection, the Chief Administrative Officer (CAO), to whom the fire chief reports to, requested the community and the FRS remain unnamed throughout the research in order to protect the anonymity of the firefighters, FRS, and community. I agreed;

even though Vancouver Island covers a large geographical area, the fire community is small. If the geographical community had been identified, the FRS would immediately be recognizable, hence the members who participated in the study would be clearly identifiable at least within that department. The FRS will be referred to throughout the study as 'TBFRS' (for *The Best Fire Rescue Service* ☺), a name that I chose because of the FRS' willingness to participate in the study, and endorsed by the participants.

4.5 DEMOGRAPHICS OF THE COMMUNITY

In keeping with the research ethics process, all identifying information has been excluded; the demographics of TBFRS are common to many FRS in BC as are the goals/mission as well as the relationships with First Nations.

TBFRS serves a population of just under 4000 souls over a geographical area of 26 sq. km (16 sq. mi). The community is a bedroom locality to a larger city, is generally rural and comprised of residential and light industry, has a population of commuters, and has a major highway running through the centre of the response area. The community is bounded by the ocean on one side, hillsides and forests on another, a city at one end, and a First Nation reserve on the other. The goal/mission of the FRS is to collaborate with citizens to provide proactive fire prevention service as noted on the website of the community. In relation to the First Nation, the TBFRS is contracted to provide fire suppression and hydrant maintenance; there is no funding/contracts for fire prevention or public education on the reserve but TBFRS will provide those services when asked. Overall this is a fairly typical geographical and population demographic for volunteer FRS on Vancouver Island.

4.6 ROLES AND RANK WITHIN THE FIRE RESCUE SERVICES

As with the majority of FRS globally, TBFRS retains paramilitary and hierarchal organizational structure and function. Within the hierarchal structure however there is room for collaboration, respect, and teamwork, and without slavish devotion to hierarchy there are clear mechanisms for, and expectations of, accountability. TBFRS ultimately exists to provide service to the community, and has a proud tradition of being well-respected and appreciated within the community. As members of the community in which they serve, the FRS personnel maintain a leadership structure within a culture of personal responsibility and

community service inside and outside the FRS.

There is a volunteer Fire Chief and a volunteer Deputy Chief, both of whom are paid a very small stipend monthly regardless of how much time they put in or how increasingly complex the job is. The Chiefs are operational as well as administrative, and duties are broad and all-encompassing including but not limited to: responsibility for directing the activities of the FRS; being the sole authority and command at the scene of an incident; responsibility for directing all volunteer firefighters and ensuring that firefighters have adequate training; responsibility for ensuring that firefighting and medical aid equipment is monitored on a regular basis and is in good working order; responsibility for all policies and procedures concerning the FRS in accordance with the local bylaw, federal legislation and policies, and in accordance with the Office of the Fire Marshall; liaison with community agencies, politicians, citizens, and other FRS. Besides the operational responsibilities, the Chiefs are responsible for administration of all aspects of the FRS: maintaining records on incidents and incidence of fire, injuries and loss of property; preparing reports on all areas of firefighting; monitoring the budget; implementing fire prevention education and awareness program. Currently within TBFRS, the Deputy Chief handles the firefighter training portfolio and education budget.

TBFRS has over 30 well-trained and committed volunteers whose years of service range from less than one year (new recruits) to 50 years. Three members are female, a ratio that is slightly higher than national and international statistics citing only 3% of firefighters (career or volunteer) as women (Government of Canada, 2014). And unlike some recent media reports of bullying and sexual harassment by male firefighters towards female firefighters (Kelley, 2015), there is a sense of gender/human equality, respect, and teamwork amongst the members of TBFRS as noted by study participants.

In keeping with the paramilitary nature of the FRS, in TBFRS there is a rank structure that includes: the fire chief, deputy chief, 3 captains, 4 lieutenants, and firefighters. Each rank has specific roles, responsibilities, competencies, and requisite training. Training nights are once weekly for a minimum of two hours, and are led by the Chiefs and senior officers. As paid-on-call members of the municipality, the firefighters are protected by Workers

Compensation and eligible to receive benefits if they are hurt on the job.

There is a 'duty officer', the officer-in-charge 24/7 who is often the fire chief but can be a senior officer delegated by the chief to be in charge and on-call when the fire chief is out-of-service, on weekends for example. The duty officer is 'on duty' and available for call from 1800 hours on Fridays until 0800 on Mondays, and is not paid for being on-call but must be available, in-district, and ready for service (i.e. rested, alcohol-free).

4.7   COMMUNITY SERVICE

A major role and responsibility of a volunteer FRS is community service. 'Community service' is a wide and varied term which includes: attending community events such as special-event-days; fundraising such as garage sales and calendar sales that allow the FRS to purchase education equipment/aids and to improve the fire hall; fundraising for FRS charities such as the Burn Fund and Muscular Dystrophy Canada; parades (i.e. Remembrance Day); fire education in schools, recreation centres, community gatherings such as service clubs, churches; fire inspections and fire education. Although community service has a time-honoured place in the FRS and is expected and relied upon by communities, there is no remuneration for the community service aspects of volunteer firefighting. Community service initiatives are 'volunteer' time to the community but have major impacts on firefighters' lives (i.e. family time).

4.8   TRAINING

A significant shift towards standardized training and minimum competencies for firefighters is underway at this time (2016). The Office of the Fire Commissioner (OFC) of British Columbia has recently provided all municipalities with a document titled the *British Columbia Structure Firefighter Competency and Training Playbook*, known colloquially as the Playbook (Office of the Fire Commissioner, 2015). The Playbook directs each local government authority (LGA) in British Columbia to examine their FRS and to declare its firefighting 'service level' – what services are required from the FRS in their specific community. The service level is to be established in order to determine minimum training standards and provide a level of safety to firefighters as well as to the public. The Playbook establishes and describes the minimum competencies required of firefighters in three categories: *Exterior*

Operations Level Firefighter which restricts firefighters to controlling and/or extinguishing fires from an external position hence no entry into buildings/vehicles; *Interior Operations Level Firefighter* which includes structure/object entry with intent to control/extinguish fire, and which requires the use of specialized procedures and protective equipment; or *Full-Service Operations Level Firefighter* which are activities undertaken by firefighters and officers trained in the full scope of competencies explicated by the National Fire Protection Association (NFPA). Each LGA is to declare its firefighting service level in order to determine the minimum training standard to be met, and the declared service level then must be fully integrated into the FRS' operating guidelines, policies and training programs. The Playbook and establishment of the LGA service level are intended to provide each FRS with globally recognized minimum training standards that utilize and extends to NFPA firefighter qualifications; however, transition to and implementation of the Playbook will significantly impact budgets and service levels in BC at least in the short-term.

4.8.a   Firefighter Training To Match Service Level

NFPA 1001 is a US standard that identifies training requirements for fire fighters in BC and some other parts of the world, and addresses competencies for entrance level, Firefighter 1 and Firefighter 2. This standard has been adopted by the Fire Chiefs Association of BC, and the Fire Services Liaison Group as a minimum standard of competency for career and volunteer fire fighters. The National Fire Protection Association (NFPA) is based in the United States and advertises itself on its website as a "global non-profit organization devoted to eliminating death, injury, property and economic loss due to fire, electrical, and related hazards" (NFPA website, 2013). The NFPA has over 300 codes and standards guiding all aspects of fire service, including training standards, advocacy, and professional development. The NFPA 1001 standard links to the upcoming LGA service levels as outlined by the OFC, and the training requirements are summarized in Table 1.

Table 1:   **Training Standards for Firefighter Professional Qualifications (NFPA 2013) and Service Levels (OFC 2014)**

	Required competencies (including but not limited to):	Service level outlined by Office of the Fire Commissioner of BC (OFC)
NFPA Firefighter level 1	Emergency scene traffic; Ropes & knots; Ladders; Fire streams, hose, & appliances; Haz mat awareness	Exterior – activities undertaken by firefighters external to structures and away from areas immediately dangerous to life and health
NFPA Firefighter level 2	As above plus Self-contained breathing apparatus (SCBA); Search & rescue; Fire behaviour; Live fire; Forcible entry; First responder level 3	Interior – structure/object entry with intent to control/extinguish fire, and which requires the use of specialized procedures and protective equipment
	As above plus First response capacity; Haz mat operations; Incident command; Pre-incident planning; and relevant Fire Officer training NFPA 1021	Full service – activities undertaken by firefighters trained in full spectrum of competencies of NFPA FF2; also must have a company fire officer with relevant training
Medical first responder (TBFRS and many FRS in BC)	First response training for the TBFRS is the Canadian Red Cross Emergency First Responder (previously First Responder Level 3)	

4.8.b   Medical First Responders

First responders, also known as Emergency Medical Responder, Emergency Medical Assistant, and various other titles that continue to change in meaning and responsibilities are recognized as key players in the provision of pre-hospital care in BC. There is currently no provincial oversight for first responders; their training, funding, and integration into communities is through the FRS and the LGA. Given the wide expanse of geography with low population in many parts of the province, and with response times for ambulance often hampered by weather, distance, and low staffing levels, many communities rely extensively on FRS first responders. Within the TBFRS, there are 10 members trained as First Responders; they have a minimum of 40 hours of training in pre-hospital care to sustain life

and prevent further injury, as well as cardiopulmonary resuscitation (CPR) health care provider (HCP) level, and automated external defibrillator (AED). They are required to recertify every three years with 20 hours of training. TBFRS' first responder curriculum is the *Canadian Red Cross Emergency First Responder* which has standardized curriculum across the country meaning competencies and certification are transferrable between provinces. Other countries such as the UK, US, Australia, and New Zealand have standardized national curricula for FRS and first responders. Standardization and interprovincial transferability is new to BC and many FRS continue to use non-standard training offered by local private companies and post-secondary education institutions.

4.9   CALL VOLUMES AND TYPES OF CALLS

Emergency calls come in through a regional 9-1-1 fire communications centre that dispatches to 27 FRS. Calls are dispatched to the local FRS and come to members by pager as 'fire', 'medical aid' and/or 'first responder'; those who are trained in those capacities will muster at the station where they collect their personal protective equipment and respond to incidents in the appropriate fire apparatus. Calls are updated on-route through laptops, mobile on-board computers, computer-aided design programs, etc. and through radio communication with the duty officer who proceeds first to the scene of the call to assess needs and update the crews. Members provide services under the direction of the fire chief and officers, and in compliance with the operational guidelines of the FRS.

In 2014, TBFRS responded to 189 calls, which is slightly higher than previous years. A summary of calls for the past 3 years is presented in Table 2.

Table 2:   Call Volume and Distribution of Calls

	2012	2013	2014
Total calls	162	127	189
Fire: structure	7	3	7
Fire: bush	2	5	4
Fire: hydro lines	2	5	4
Fire: 'other'	18	5	10
Alarms activated	9	17	13
Burning complaint	28	17	36
Hazardous materials	4	3	
Motor Vehicle Incidents (MVI)	23	18	24
Medical aid	61	50	78
Assistance	5	4	4
Rescue	1	1	1
Mutual aid	Not known	1	3

In 2014, the majority of calls were medical aid (78 or 41.3%), with MVI constituting an additional 24 (12.7%) of the call volume. Actual fire calls are distributed across structure fires (7 or 3.7%), bush fires (4 or 2.1%), hydro electrical line fires (2 or 1.1%), and 'other', (defined vaguely but generally includes examples such as citizens smelling smoke and the FRS responding) (10 or 5.3%). Other fire-related calls include burning complaints (36 or 19%) which include beach fires, burning yard waste out-of-season, etc. and 'alarms activated' (13 or 6.9%) when a smoke or fire alarm goes off and the FRS investigates; even when all fire-related calls are combined, they are in the minority of responses annually. This trend is reflective of the changing patterns in the FRS; whereas previously members joined the fire department to 'put wet stuff on red stuff', they are now involved in many more human-related interactions as part of their routine duties. Figure 3 is a visual representation of call distribution.

Figure 3:   **Distribution of Emergency Calls (2014)**

DISTRIBUTION OF CALLS

JAN 1 2014 – DEC 31 2014

Medical Aid 41.3 %
Mutual Aid 1.6 %
MVI 12.7 %
Hydro Lines - Fire 1.1 %
Rescue 0.5 %
Fire - Other 5.3 %
Structure Fire 3.7 %
Bush Fire 2.1 %
Alarms Activated 6.9 %
Burning Complaint 19 %
Assistance 5.8 %

('TBFRS' statistics - used with permission)
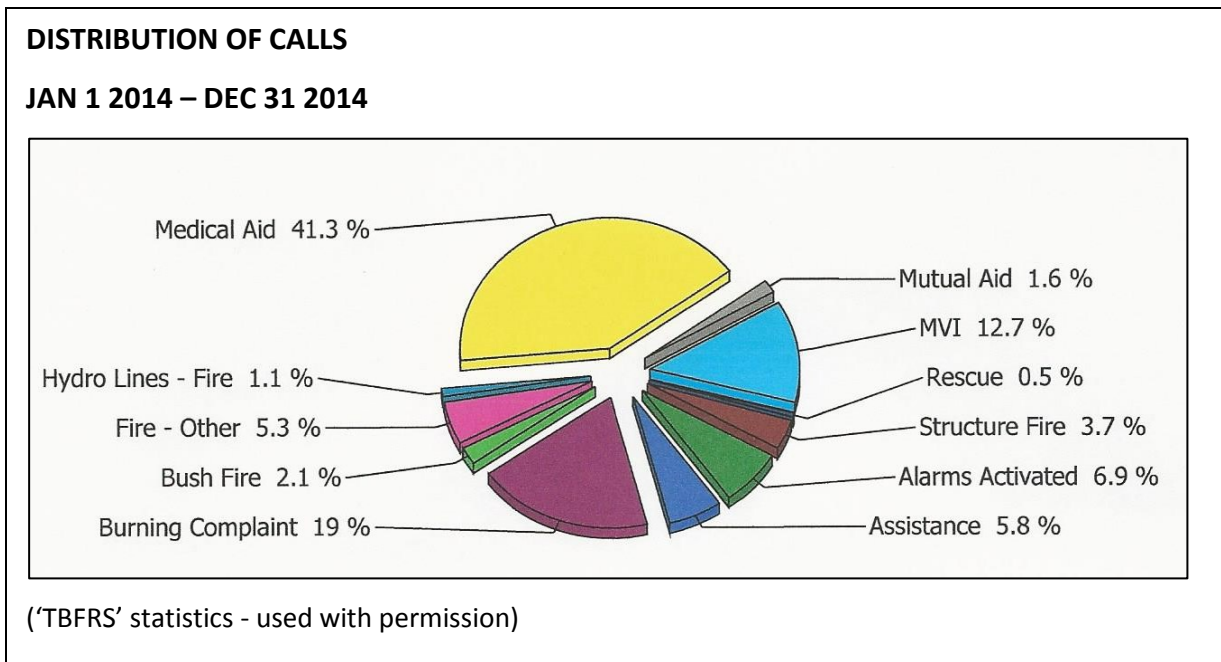
4.10   THE CHANGING FACE OF THE FRS

Trends in the FRS in the past years point towards more medical aid and MVI, fewer fire calls, and more focus on fire prevention and public education. Fewer fire calls have resulted from improved building construction, flame-retardant construction materials, better building inspections, more effective warning systems, and improved marketing of warning devices such as working smoke detectors.

In relation to MVI, injury is the leading cause of death among young adults in the western world and trauma is increasing the burden on the health infrastructure of the developing world (WHO, 2005). Injury and fatality from MVI are usually caused by multi-system trauma resulting from: collision between a person and the external environment (the vehicle, or a stationary object if the person has been ejected from the vehicle); and/or acceleration or deceleration forces in the vehicle acting on a person's internal organs. There is frequently substantial damage to people and vehicles in highway crashes and the crash scenes and injuries are often graphic and gruesome, engendering distressing reactions for firefighters and witnesses not to mention the victims themselves. These injuries and fatalities can be significantly decreased through the use of (for example): technologies such as: seatbelts and

airbags as well as changes to vehicle design; and infrastructure such as road design and barriers, signage, etc. (Canadian Council of Motor Transport Administrators, 2015). Anecdotally per the members and the statistics of TBFRS, the numbers of MVI's have remained fairly consistent over the years, but severity of crashes and fatalities have decreased since the installation of a concrete barrier dividing the section of highway running through the area. Changes in highway infrastructure have resulted in changes to the types of MVI's that the FRS responds to but has increased the need for higher level medical aid response.

Overall, firefighters are much less engaged with fires and much more engaged with the human side of the FRS: frequent medical aid calls where outcomes have been decided before the FRS arrives (as in the case of cardiac arrest and other sudden death); and motor vehicle incidents where firefighters are dealing with not only extrication of victims from vehicles but also with bystanders and others who may experience psychological trauma from unexpected and often gruesome events. The changing nature of the FRS creates the need for a new set of required skills (emergency medical techniques, vehicle extrication techniques); as well, the nature of firefighters' interactions with human tragedy requires a skill set to manage one's own reactions and the reactions of others (i.e. family/friends of victims, community members, etc.) during and following the call.

4.11   SUPPORTING THE FIREFIGHTERS

The TBFRS recognizes the inherent psychological risks within the FRS, and has a Critical Incident Stress Management (CISM) program with a mandate to provide a 'safety net' for FRS personnel/management exposed to disturbing work related incidents that may impact on mental and physical health.

TBFRS' CISM program is over 10 years old, and utilizes the ICISF model (Everly & Mitchell, 1999). The program is overseen by a CISM peer support 'team', consisting of 4 CISM-trained and experienced firefighters. The CISM program, policies, and procedures are included in the TBFRS operational guidelines, which are readily available to all fire service personnel, and are a key part of recruit training. The CISM team provides primarily 1:1 peer support, and small group 'defusings' post-incident, and has high visibility within the FRS; regular

awareness 'updates' are provided to the FRS members during training nights, new recruits receive information early in their training process, and informal stress 'chats' take place after many of the calls in order to keep psychological health fore-fronted and routine within the FRS. The CISM team is also associated with Archipelago CISM Society, a non-profit, volunteer organization based on Vancouver Island that is responsible for providing CISM education, awareness programs, referral network, and critical incident stress interventions such as group defusings and debriefings to fire and other emergency services. TBFRS is a member of Archipelago hence has access to resources such as training curriculum, mental health professional for training and intervention as needed; in return, TBFRS peer support personnel are available to Archipelago to assist with interventions in other FRS as needed.

TBFRS considers each call to be a 'teaching moment', and routinely has an operational review immediately at the end of the call, sometimes occurring as gear is being cleaned/put away. The senior officer on a call also assesses the need for psychological support through role modelling after the end of the operational review, opening the discussion with questions/comments such as: 'how's everyone doing? That was a bit of a tough call; I know I'm feeling upset about it – let's go and talk about how we're doing and what we can do to get past this'. When necessary, the CISM team is formally requested, although most frequently they are well aware of the calls and proactively begin discussions of potential psychological implications of specific calls such as child injury or death, other calls with negative outcomes, knowing the victims, etc. Upon occasion (such as when the CISM team members are involved in the call), support from outside resources such as other CISM teams or mental health professionals are requested; as noted TBFRS is a member of a network of CISM programs and access to external assistance is quick, reliable, and trusted.

4.12 TRANSITIONING FROM CONTEXT TO METHODOLOGY

There are changing requirements for volunteer FRS, ranging from compulsory training to an evolving context and 'face' of firefighting. These changes are evident not only in the roles and skill sets of firefighters but also in the language used to describe the fire service which has evolved from 'fire hall' to 'station' and 'fire department' to 'fire rescue service'. The transition that FRS are undergoing also sets the stage for evolving the understanding of stressors faced by firefighters, and for firefighters' capacities for resilience in the midst of

change and an ever-increasing interface with the human aspects of the FRS. Broadening the understanding of resilience now requires divergent methodologies and methods, and inclusive and interdisciplinary collaboration; there is no 'one-size fits all' model for fire rescue services nor is there a simplistic understanding of resilience. The next chapter will provide an in-depth discussion of the methodology and methods employed in the conduct of the study.

4.13   CHAPTER SUMMARY

This chapter has overviewed the FRS in British Columbia, Canada in relation to career and volunteer FRS, as context for the FRS participating in this research. An overview of TBFRS was offered as was a review of roles and responsibilities of volunteer firefighters, the changing face of the FRS, and a review of supports for firefighters. Protection of anonymity in the research was discussed.

Understanding the demographics and roles, as well as the changes occurring within the FRS, helps to set the stage for the research questions about stress and coping in the context of this particular FRS. Also, having a sense of the call volume and types of calls, roles and responsibilities within the FRS, and some of the tensions experienced by volunteer firefighters are foundational to conceptualizing a definition and theory of resilience in the volunteer FRS.

TBFRS is representative of many of the volunteer FRS in Canada in its governance, demographics of community and FRS membership, geography, and close relationship to the community. The demographics of the community (population base, rural geography with interface between residential and natural resources, and a major highway in the midst of the community) are unexceptional in the context of a volunteer FRS. For example, the governance by a local authority who is fiscally and politically responsible to a populace beyond the FRS results in tensions as organizations jockey for limited resources and those tensions spill over onto the FRS particularly when new initiatives such as the 'Playbook' are imposed from external sources; members of most FRS are concerned about how to continue to fund quality service to their community. Another example of typicality is the vested interest TBFRS members have in community service since, as with many volunteer FRS, they

and their families live and work in the community they serve; this relationship with community adds pressure for all volunteer firefighters (and their families) compared to other professions/community members who do not routinely interact with friends and family in crisis. It is invaluable to this programme of study to work with a FRS that is prototypical in order to lay the foundation for resonance, credibility, and usefulness of the constructed grounded theory; these are three criteria for evaluating grounded theory studies (Charmaz, 2014, p. 337) and more will be said about this in section 6.5. Typicality was a consideration as well when deciding against examining cross-country resilience. For example, Canadian firefighters are trained as medical first responders which adds a layer of interaction with human suffering that is not as present in FRS who are not medically trained such as FRS in the UK; this will be further discussed in section 5.4. As well, focusing on one TBFRS was of benefit methodologically because of the large volume of data generated in constructivist grounded theory research; resonance and usefulness were examined through the use of two external advisors and again this process will be described in more detail in section 6.3.b.

In contrast to its typicality, TBFRS is innovative in its proactive orientation towards health and health promotion with its long-standing CISM program and ongoing awareness and education sessions about stress and coping that are offered to FRS members and their families. Familiarization with health constructs and increased knowledge about reactions and coping with stressors have been linked to resilience (see for example: Southwick et al., 2014). Choosing a FRS that already understands 'health' limited the possibility that the research would be diverted by 'risks', 'pathology' and other traditional pathways of exploring resilience; this programme of study is firmly fixed within a salutogenic framework as has been discussed throughout Chapters 2 and 3 and contributes originality to the exploration of resilience in volunteer firefighters.

The typicality of TBFRS as a volunteer FRS and its unconventionality as a FRS that values health and health promotion for its members combine to add to the academic legitimacy for the choice of TBFRS and for this programme of research. Having contextualized the study, the next chapter will describe the methodology and methods.

CHAPTER 5: ALIGNING THE METHODOLOGY

5.1   Overview

This chapter will outline the ontological and epistemological influences on the choice of research methodology, and will describe the study's conduct. I will discuss how nursing history has influenced my approach to research, and describe how the research questions in this program of study are situated in multiple contexts such as health, health promotion, and interdisciplinarity.

5.2   The Ontological, Epistemological, And Methodological Journey

Resilience research has traditionally been explored within specific disciplines such as psychiatry, psychology, and social work; each discipline brings its own ontological and epistemological perspectives that, over the years have elevated our understanding of the complexity of the construct of resilience. Recently however there have been increasing calls for "transdisciplinary research" (Panter-Brick & Eggerman, 2012, p. 29) that recognizes the heterogeneity of responses to adversity as well as the diversity of contexts in which resilience is conceptualized and operationalized.

My professional background is nursing and over the years I have practiced and taught nursing in a variety of contexts although my recent practice has focused on mental health. There are many influences on my current roles as educator and researcher and many of those influences are from nurse theorists. Following is a summary of leading theorists whose ideas most influence my practice and my research.

5.2.a   Historical Context Of Nursing Research
Study the well

Nursing practice and research has historically been dominated by the positivism of the 'medical model' with its pure science approach and reductionist assumptions about illness and disease. However, there has been a thread of pluralism and calls for "other ways of knowing" (Carper, 1978, p. 377) in nursing since the time of Florence Nightingale. Although heavily influenced by her Victorian upbringing with its gender-defined 'rules' of behaviour and thinking, Nightingale stepped out of the box of dualism, and directed her *Notes on*

Nursing (Nightingale, 1859) to women who "have personal charge of the health of others" (p. 6), continuing the cultural norm of women as caregivers, but recognizing that providing care gave women unique perspectives on health and healing. Nightingale was one of the first to note that "all disease is...a reparative process, not necessarily accompanied by suffering" (p. 5) hence looking beyond simple illness and questioning the prevailing perspective that people are sick, ill, and suffering. No doubt people may be ill at times and nursing will assist in illness recovery but Nightingale went beyond this reductionist view and recommended studying those who are healthy in order to better understand what contributes to health and wellness. "Pathology teaches the harm the disease has done [b]ut ...nothing more" (p. 74). Nightingale noted that studying the well and assisting the reparative process meant considering such social determinants of health as: air quality and ventilation, cleanliness of person and environment, nutrition, infection control, as well as innovative nursing interventions such as: person-centred care, pet therapy, and a focus on observation or 'being with' instead of simply 'doing to' patients (p. 58-59). Although the majority of Nightingale's notes focus on the tasks and activities of nurses many modern nurses, myself included, have been influenced by Nightingale's ideas of holism, healing, and health promotion.

Relational practice

Nearly 100 years after Nightingale, Hildegard Peplau, a nurse theorist began a long-running cross-disciplinary partnership with Harry Stack Sullivan and his psychology colleagues. Peplau (1992) spent much of her career furthering Sullivan's interpersonal theory (Sullivan, 1953) for use in nursing with an emphasis on the nurse-client relationship as the primary tool for healing. Peplau created a pivotal shift in nursing; her book on interpersonal theory is credited with transforming the practice of nursing from a group of workers with a specific skill-set to a fully developed profession. Certainly Peplau has influenced my psychiatric and general nursing practice; I recognize, value, and promote interpersonal nursing processes such as engagement with people, inquiring about people's perspectives, and having a nursing, teaching, and research practice that focuses on people and interpersonal processes.

Practice informs theory

Subsequent theorists recognized that interactions between theory and experience (Benner, 1984) are the conceptual underpinnings of nursing and nursing education. Nursing is a practice discipline that is predicated not simply on tasks and science but on dynamic interactions that go beyond the nurse-client relationship; however measuring and quantifying 'caring', interactions, and interpersonal processes has proved highly problematic and limiting to nursing practice. For example, Watson (2009) notes that attempts to define and measure caring have reduced and trivialized the concept while debates rage over the meaning and location of caring within a paradigm of nursing science. Patricia Benner (1984), though, recognized the interplay between theory and experience, and revolutionized nursing with her conceptualization that nursing practice informs theory, not the other way around. Benner's perspectives underpin my nursing practice and teaching which encourages participation in one's health and/or learning, with the person (aka patient, consumer, student, research participant) being the central figure in health, healing, research, and teaching.

Ways of knowing

Concurrently to nurse-person interactions and person-centred care being recognized as critical to nursing, Carper (1978) questioned the accepted paradigm of empirics as the only truth method of 'knowing', and suggested that knowledge is enhanced through multiple ways of knowing. Carper's "fundamental patterns of knowing" (p. 337) are described as: aesthetics, the art of nursing expressed through interaction, attitude, actions, and intuition (without conscious deliberation); ethical knowing that includes ethical reasoning, obligation, ideas of right/wrong, ethical codes of nursing and moral knowledge; personal knowing which is the therapeutic use of self, necessitating a grounding in self-awareness and capacity for reflection and reflexivity; and empirics, knowledge that is based in traditional ideas of science, a truth that can be seen, touched, heard and which has a reality that requires conscious thought and reasoning. Carper's radical challenge to nursing's underlying assumptions and values about knowledge development hence research practices, was persuasive and subsequent theorists built on Carper's ways of knowing.

Unknowing and emancipatory knowledge

Munhall (2012) furthered Benner's and Carper's conceptualizations of nursing knowledge by describing "unknowing" (p. 74) and "listening with the third ear" (p. 22); both concepts relate to suspending one's own knowledge or at least back-grounding it and fully focusing on what the other is saying/doing/being, not only person-centred nursing actions but also relevant to qualitative research methods. Similarly to Carper's personal knowing, Chinn and Kramer (2011) helped advance nursing theory by recognizing the role of critical reflection and one's situatedness in multiple ways of knowing as key to holistic nursing. These multiple epistemological perspectives provide a much broader and more holistic way to 'be' a nurse (Benner, 1994), and in the latter half of the last century, equal valuing of systematic inquiry that made use of other ways of knowing (art, personal meaning, ethics, reflexivity) emerged. These perspectives of caring, ways of knowing, health and holism, and reflexivity firmly underpin my personal values and nursing practice hence this programme of study. Although there are other nurse theorists who have contributed to the field, Nightingale, Benner, Carper, Munhall, and Chinn are the theorists who have best represented and influenced my own relativist ontological and subjective epistemological approaches to nursing and research.

5.2.b   Situatedness of This Research in a Transdisciplinary Context

Resilience research has traditionally been explored within specific disciplines such as psychiatry, psychology, and social work; each discipline brings its own ontological and epistemological perspectives that, over the years have elevated our understanding of the complexity of the construct of resilience. Over the past 10 years or so, however, the complexity of the construct has become more evident as has the idea of resilience following adversity as the 'norm'. However our capacity, across disciplines, to understand and integrate concepts of health, health promotion, and resilience into practice remains nascent at best, and broadening our resilience acumen in particular will require transformative knowledge development and dissemination across disciplines (Panter-Brick, 2014; Merton, 2015); recently there have been increasing calls for "transdisciplinary research" (Panter-Brick & Eggerman, 2012, p. 29) that recognizes the heterogeneity of responses to adversity as well as the diversity of contexts in which resilience is conceptualized and operationalized.

Choi and Pak (2006, 2008) wrote a series of cascading articles with clear and concise explanations of the concepts of multidisciplinarity, interdisciplinarity, and transdisciplinarity; almost every research text defines at least one of these terms in its glossary but there is ongoing confusion about the meaning of the terms and they are often used interchangeably despite the differences between them.

My research questions have evolved from my nursing work with military and para-military personnel diagnosed with PTSD, to a curiosity about what keeps people well in high-risk professions, to the current wonder about resilience in the context of volunteer firefighters. Although I am influenced by nursing, it seems obvious that broader perspectives and knowledge about the construct from outside of nursing will only benefit our understanding. My previous interdisciplinary research (nursing, psychology, firefighters) provided multiple lenses from which to view concepts of workplace health, and allowed for rich analysis and realistic yet contextually relevant and evidence-informed recommendations (Blaney, 2009, 2012; Blaney & Brunsden, 2015). As well, resilience seems to be better situated as a 'health' construct as we expand our understanding of resilience as adaptive, normative, and cross-contextual (Ellis, 2015); this requires collaborative approaches to increase the depth and breadth of knowledge about health and wellness in various contexts, and to ensure there are a multitude of lenses (ontological, epistemological and methodological) through which to explore resilience.

The linkages of this programme of study were developed explicitly. I am a nurse, working with firefighters, hence interacting across two disciplines. There is a shared interest in the psychological health of firefighters, particularly resilience. I could have chosen to approach the study of research from a nursing or human resource/management level, but I perceived limitations to both. Epistemologically, nursing has a heritage in medicine or illness (see previous section, this thesis) and human resources more often deals with employee performance and disability as I discovered when I did a Google search of human resource job opportunities. It seemed reasonable that, in order to consider resilience from a number of epistemological perspectives, that a programme of study outside of nursing and management would be required; I chose a social sciences system and psychology subsystem in which to place this research. Although the conceptualization of resilience is my own, it is

the juxtaposition of the concept across contexts, and the rich discussions with firefighters and the supervisory team that add robustness to the theory.

At the start of the programme, I felt strongly that in the interest of furthering our competency in resilience, interdisciplinarity would be key in order to fully contextualize factors (Ungar, 2012b; Panter-Brick, 2014) such as: the adaptive mechanisms of resilience (Bonanno, 2004; Ellis, 2015); the neurobiology of resilience (Ellis, 2015; Yehuda et al., 2013); the effects of multiple methods of research (Merton, 2015) on our understanding of resilience; the role of culture in resilience; etc. My role would be akin to the 'case manager', analysing and synthesizing data from firefighters and nursing, and creating a broader understanding of resilience. As I moved through the programme however it became obvious that the interactions between myself, the firefighters, the data/analysis, the supervisory team, and ultimately the construction of theory of resilience transcended existing knowledge and created a new theory; transcendence was also achieved through balancing and integrating the multiple epistemologies – nursing, firefighters, and psychology – and highlighting the subsystems of health, health promotion, occupational health, academic rigour, etc. I would now consider this research to be transdisciplinary in that it brings together multiple perspectives/disciplines, defines resilience as a multidimensional dynamic construct, and creates new knowledge across those disciplines, thereby addressing the research questions.

5.2.c   Beyond the Medical Model: Health Promotion and Salutogenesis

Health promotion is a prevalent concept in nursing and is one of the key philosophical underpinnings to many nursing education programs (see for example: Collaborative for Academic Education in Nursing [CAEN], 2013). Expanding on the discussion of these concepts in chapter two of this thesis, *health* and *health promotion* are foundational concepts to nursing theory and practice hence should be foundational to my exploration of 'resilience'. However, clearly defining and operationalizing health concepts have proven problematic over the years. Morse (2012, p. 70) asserts that health is an empirical concept defined by scientists, adopted by organizations such as the World Health Organization (WHO), and defined and taught as a truth hence limiting practice of and research into the concept; Morse decries the absence of curiosity and inquiry into health and health promotion, and

the unquestioning adoption of the concepts despite the lack of theoretical development. The perspectives of CAEN, Morse, and others may on the surface appear to be at odds with one another, however the questions raised by Morse seem to be indicative of the growing confidence of nursing to question and challenge the hegemony of practice and research.

As noted in section 5.2.a of this chapter, epistemologically and ontologically I am firmly grounded in health and health promotion; people 'live with' differences in health – they may have a diagnosis of pathology but they are still living day-to-day with their diagnosis and its manifestations. The 'how' and 'why' of these experiences, although not directly part of this programme of research, may be informed by firefighters' understanding of resilience. Health is a resource (WHO, 1986) existing in a social context and defined by those experiencing it (Labonte, 1989). Health promotion is a concept, a philosophy, and a set of practices and has been defined as: "the process of enabling people to increase control over, and to improve, their health." (World Health Organization, 2009 p. 2). This is in keeping with my conceptualization (see chapter two, this thesis) of health as a dynamic helix with multiple points of access to personal and SOC resources that allow people to influence their own health; one of those resources is resilience (WHO, 2009). These definitions and philosophies of health and health promotion differ significantly from the prevailing biomedical approach looking for psychopathology that requires treatment; a health promotion philosophy allows firefighters to define stress as normal and expected in the context of their jobs, and to put emphasis on resilience as a health construct to mitigate the effects of stressors.

There is a mixed bag of understandings and practices in health promotion. In response, Antonovsky (1996) introduced the idea of salutogenesis which, rather than a model of "keeping people well" (p. 13), describes health origins and is a "theory of health... [to study] strengths and weaknesses of promotive, preventive, curative and rehabilitative ideas and practices" (p. 13). Salutogenesis was defined in chapter two, but in review, the basic premise of salutogenesis explains how and why people stay well, despite ever-present physical and psychological stressors. Current definitions of health promotion continue to reside within a context of lifestyle and "risk factors" (Antonovsky, p. 12), and in keeping with a risk orientation, recent studies of stress and trauma have attempted to simplify the concepts and context of the human system by utilizing checklists of symptoms and risk

factors of disease (i.e. PTSD); ultimately, this remains a pathogenic orientation.

Antonovosky (1996) proposed that this dominant, dualist, and simplistic paradigm classifies people "into those who have succumbed…to some disease…and the residual category" (p. 13); in the case of my research the 'residual category' is the majority of firefighters exposed to trauma who remain healthy.   Today, it is obvious that people and their voices are lost in the politics and financing of disease management; look no further than local health authorities and their funding priorities which include technology, healthcare worker and executive salaries, and acute care/illness treatment programs with minimal focus on wellness and health promotion services (Vancouver Island Health Authority, 2014). Antonovsky, when speaking of the human stress response being situated in a disease model, says "The identification of human complexity with one-faceted particularity is simply poor care" (p. 14), and urged moving beyond the illness paradigm to one of salutogenesis.

Almedom (2005) offered a summary of multidisciplinary literature that linked resilience, hardiness, and sense of coherence as positive outcomes post-trauma, and also called for a broader conceptual analysis of stress and coping. Almedom notes there are many calls to move beyond psychobiomedical models and cites as examples: Miller, 2003; Powell et al., 2003; Summerfield, 1999; and Tedeschi & Calhoun, 1996. Utilizing multiple disciplines brings rich knowledge and experience and contributes to a broader, deeper model of health. This programme of study is an attempt to broaden the understanding of resilience as a health promotion construct, not to ignore medical diagnoses but to respond to the calls to move beyond illness care and to consider health and salutogenic perspectives.

5.2.d   Unanswered Questions About Health in the Volunteer Fire Rescue Service

Chapter three of this thesis found several calls for robust and mixed methods for resilience research (see for example: Almedom, 2005; Bonanno, 2012). In an attempt to move beyond sick-care and to make multiple perspectives visible, my previous research used 'mixed methods' to examine health and resilience in firefighters in Canada and the UK (Blaney, 2009; Blaney & Brunsden, 2015). The result was a large amount of data, including evidence that firefighters are resilient as evidenced by moderately high scores on the Resilience Scale (RS) (Wagnild, 2010; Wagnild & Young, 1993); firefighters also utilized a number of 'adaptive'

coping strategies as indicated by Carver's (1997) Brief COPE. Both the RS and the Brief COPE are well established valid and reliable tools (see for example: Wagnild, 2009) that have been used in a variety of contexts and cultures; findings from both scales indicated that firefighters are resilient and have numerous healthy coping strategies. As well, there was opportunity for firefighters, in written narrative form (Blaney, 2012) to define and describe their experience with resilience. However, there was no opportunity for me to examine the meaning, implications, or understandings of these concepts with the firefighters or to examine how firefighters become resilient, stay resilient, and continue to cope despite ongoing psychological risks hence this programme of research was undertaken. Also, although there was a lot of data and quantitatively firefighters appear resilient, the outcomes did not further our understanding of resilience. Nor did the research further our understanding of how more firefighters stay well and are retained in the FRS than become ill despite the risks inherent in the profession.

Subsequently, the questions that arose and that are the aims of the current programme of study as articulated in section 1.5 are:

1.1. What incidents are considered by firefighters to be potentially traumatic?

1.2. How do firefighters react to potentially traumatic events (PTE's)?

1.3. How do firefighters 'cope' with their reactions to PTE's?

1.4 How do volunteer firefighters define resilience in the context of the FRS?

1.5 What are the core concepts of a theory of resilience in the FRS?

1.6 What are the relationships between and among those components?

It was apparent that none of these questions have been answered by previous research. It also became clear that different methodologies and methods would be needed to gather more in-depth, rich, and meaningful data in order to understand resilience and to develop a relevant theory of resilience in volunteer firefighters. So despite Almedom (2005) and others calls for longitudinal mixed methods (Bonanno, Pat-Horenczyk, et al., 2011; Ungar, 2008), this study is qualitative using constructivist grounded theory methods in order to capture the depth and richness necessary to answer the questions related to resilience in the volunteer FRS and to formulate the theory.

5.3   CHOICE OF METHODOLOGY

5.3.a. Aligning Methodology With the Aims of the Research

The research questions lend themselves to grounded theory method, the "how and why things happen" (Mayan, 2009, p.35). As reviewed in the previous section, the primary aims of the research are to explore firefighter perspectives of stress, coping, and resilience, and ideally to develop a theory of resilience in high risk professions such as the FRS; this project looks at resilience and coping with workplace psychological stress through a health promotion lens which in turn will allow firefighters to exert some control over their health. *Resilience* is a complex phenomenon that lends itself to qualitative methods of study (Morse & Niehaus, 2009) that explore people's perspectives of the phenomenon and their understandings, actions, and relationships with it. The theoretical perspective or theoretical 'drive' of this research (the lenses and philosophies that influence the research) are relativist, subjective and multiple, inquiring into the taken-for-granted practices of exploring trauma from an illness perspective, which in turn is in keeping with my professional and personal way-of-being as a nurse and researcher. The research questions fit with grounded theory methods that invite participation and co-creation of meaning – the 'construction' of knowledge about resilience from firefighters – in contrast to a traditional reductionist view of resilience as the absence of pathology, again congruent with my epistemological and ontological perspectives.

Developing the research questions was a reflexive and reflective process: reflectively posing thoughtful questions about resilience and the FRS, and what I want to learn about resilience; and reflexively how and why I see resilience, and my situatedness in the FRS as an active participant to the research process by making meaning of resilience (Burns et al., 2012). The decision-making process for choice of methodology/method was twofold. Initially there were lengthy reflective discussions with members of my PhD committee and members of the FRS, reviewing the research questions. A key point that arose was the realization that to explore in-depth, and to contribute original work to the field, the methodology must be focused and allow the data to be robust/rich and emerge from firefighters in order to provide a substantive theory; grounded theory emerged as the methodology that 'fit' with the intentions and questions of the research although other methodologies were explored (phenomenology, ethnography, mixed methods).

Additionally, I considered the ontological, epistemological, and methodological influences that needed to be addressed as part of the choice of method which in this case was confirmed to be **constructivist** grounded theory (CGT). Mills, Bonner, and Francis (2006b) note that constructivist grounded theory is a "methodological imperative" (p. 2) when the following beliefs about reality and knowledge are held:

- a relativist ontology which sees reality as pluralistic, socially constructed, contextual, and which denies the existence of an objective reality;

- a subjective epistemology that acknowledges the role of the researcher (Gardner, Fedoruk, & McCutcheon, 2013) and inquires into the subjective relationships and inter-relationships (Mills et al., p. 2) between the researcher and participants in the co-construction of meaning.

This programme of study required collaboration and interaction with firefighters in order to construct a theory that is relevant to them and not imposed from a context that may not 'fit'. I was active in the research process by virtue of my prior knowledge and experience in the FRS, and prior experience with research; I am the bridge between firefighter practice and resilience theory. More will be said about the reflexivity necessary for researchers in section 5.4.c.

5.4   RATIONALE FOR CONSTRUCTIVIST GROUNDED THEORY

5.4.a   A Brief History Of Grounded Theory

There are many interpretations of 'grounded theory' (GT) as a method, methodology, and philosophy (see for example: Charmaz, 2005, 2014; Glaser & Strauss, 1967; Mayan, 2009; Strauss & Corbin, 1994). A discussion of GT that covers only a few paragraphs and ideas is in itself reductionist yet subjective; however for the sake of brevity in reading through material that has been better articulated elsewhere (see for example: Glaser, 2004; Glaser & Strauss, 1967; Strauss & Corbin, 1994), a historical perspective is offered in order to contextualize the current research. In my research grounded theory drives the project presenting options to hear the voices of firefighters, allowing data to emerge as opposed to being forced, and constructing a substantive theory from those perspectives through the interaction between the researcher, participants, and data.

Grounded theory is "a comparative method in which the researcher compares data with data, data with categories, and category with category" (Charmaz, 2005, p. 517); linking *what* firefighters say about stress and coping to policy and practice that *actions* health promoting and resilience practices is critical. Grounded theory requires the researcher to transcend descriptive research (Wuest, 2012) and instead develop a theory that identifies not only concepts but the relationships among and between them. Grounded theory anchors actions, practices, and policies in the research by providing the connections between the understandings and the experiences of the researched phenomenon (Charmaz, p. 512). This study explored firefighters' perceptions of stress, resilience, and coping and provides the links between those phenomenological experiences and theory that will guide the practice and policies of workplace stress management and resilience enhancement. As well, grounded theory provided the opportunity to juxtapose participants' experiences and understandings of work-related stress against prevailing academic and/or medical perspectives (Charmaz, p. 513) by focusing on resilience, asking firefighters to situate themselves in it and to talk about it, and then further comparing/contrasting those perspectives with the 'illness' paradigms as well as with resilience research that typically has focused on children. Ultimately my approach, method, and analysis provided a practical and theoretical framework for resilience in the emergency services.

Glaser, Strauss, and Corbin (Glaser, 1978; Glaser & Strauss, 1967; Strauss & Corbin, 1994) redefined research and articulated co-occurring processes of "generating theory and doing social research" (Glaser, 1978, p. 2). In traditional or 'classic' (Glaser, 2004) grounded theory, Glaser and Strauss described theory as "emerging from data separate from the scientific observer" (Charmaz, 2014, p. 17) and data collection as inductive with the researcher having "no preconceived ideas to prove or disprove" (Mills, Bonner, & Francis, 2006b, p. 3). Glaser valued empiricism, rigorous codes, emergent discoveries and "somewhat ambiguous...language that echoes quantitative methods" (Charmaz, 2014, p. 9). In order to come to a theory, a set of procedures is prescribed, and Glaser advocates strict adherence to those procedures. Two of these strictures are: the researcher maintains an objective stance through listening to participants "venting issues rather than encouraging them to talk about a subject" (p. 11); and the researcher leaves the literature review until after theory has been generated in order to avoid contamination from, and forcing data into, existing concepts. I

don't believe that given my life experiences, my work as a nurse and with firefighters, and my epistemological perspectives around knowledge (co-creation, etc.) that classic GT's presumption of objectivity is a good fit for me or for this research. Also, my curiosity about firefighters' perspectives of resilience goes beyond simply listening to them vent; they live the experience of PTEs daily yet are resilient (Blaney & Brunsden, 2015), and I am curious about how and why they are resilient and what resilience means to them. As well, since I have 'lived' resilience for so many years again in my nursing practice and with firefighters, I have a pre-existing familiarity with extant and emerging literature, so to pretend that I don't have knowledge about resilience or that I know nothing about various perspectives on resilience is an impossibility; once again, it is evident that classic GT was not a fit for me or the research.

Strauss and Corbin further developed the grounded theory approach by denying a purely objectivist position (Strauss & Corbin, 1994, p. 279), and coming from a more pragmatic perspective. Strauss valued process over structure, subjectivity, social meanings and language, and action or problem-solving as a method of verification (Charmaz, 2014). Strauss', and later Strauss and Corbin's, focus on verification and the use of tools and checklists to gather and order data nevertheless alluded to an objective reality and continued the reductionist perspective. However Strauss and Corbin have evolved grounded theory to a more "interpretative approach to developing theories" (Gardner, Fedoruk, & McCutcheon, 2013, p. 68) resulting in some acknowledgement of the relationship between the researcher and the researched (Strauss & Corbin, 1994). As well, Strauss and Corbin explicitly defined 'theory' as relationships between concepts, patterns, interactions, and inter-actors, noting the "context of data collecting and data analyzing" (p. 278) requires the interactivity of the researcher, and the willingness of the researcher to explore the suitability of the theory to various contexts. Looking at relationships between/among data, interacting with participants and data, and considering multiple realities in theory development is a better fit for me; again, my epistemological and ontological influences are clearly subjective, co-creative, and relativist.

Given the divergence of approaches to grounded theory, McCann and Clark (2003b) caution against a taking a position that sides with either Glaser, Strauss, Corbin, or subsequent

iterations of grounded theory, but to view the multiple iterations of grounded theory as an indication of growth and evolution as well as clear evidence of the diverse yet rich epistemological perspectives held by researchers. A succinct comparison of the epistemological and methodological underpinnings of Glaser's and Strauss and Corbin's approaches to GT is offered by McCann & Clark (2003a), highlighting differences in epistemology, the role of researcher, theory construction, data collection and analysis, use of literature, emergence of the research problem and evaluation of studies. El-Hussein et al. (2014) offer a helpful overview of grounded theory as an appropriate method of inquiry when exploring nursing and social phenomena; their work helped to reinforce constructivist grounded theory (CGT) as the method of choice for this research. As the historical context of grounded theory has been explored, discussed, and debated, two key issues have always created dis-ease for me: the removed role of the researcher, and the delay of the literature review; fortunately, further diversification of GT has occurred in the past 40 years which addresses these issues, again indicating growth and evolution of the methodology.

5.4.b   Constructivist Grounded Theory

Grounded theory refers to theory that is developed 'inductively' from data. Grounded theory is defined by Charmaz (2005) as "a method of inquiry and the product of inquiry...and to mean a specific mode of analysis" (p. 507) and explores among other questions "what is happening, and what are people doing?" (p. 514). Following a review of grounded theory and its evolution, I chose *Constructivist Grounded Theory* (CGT) (Charmaz, 2014) for this research. CGT "emphasizes the studied phenomenon rather than the methods of studying it" and recognizes the interpretive frame of reference inherent in research, "giving close attention to empirical realities...and locating oneself in these realities" (Charmaz, p. 509). Charmaz notes the strengths of grounded theory come from the co-occurring comparative methodology and the interactivity of theorists with the data and participants (2011, p. 361), and further asserts that the researcher constructs theories from interactions with data, people, and others' viewpoints, recognizing one's own perspective and reflexively juxtaposing that against the interactions. These facets of CGT are a much better fit for my personal subjective, relativist epistemology/ontology, as well as for the research questions; I am interested in resilience in the context of challenges faced by firefighters, and recognize that there are a number of perspectives on resilience including but not limited to

developmental, emerging, and incident-specific resilience, none of which completely explain resilience in firefighters. Mills, Bonner, & Francis (2006b) note a constructivist thread running through Strauss and Corbin's work but note that Charmaz was the first researcher who explicitly identified her work as "constructivist grounded theory" (p. 7) and whose work consistently forefronts participants' perspectives throughout the research process. Although CGT has evolved from the work of Glaser, Strauss, and Corbin, CGT focuses on underlying processes by: consolidating participants' stories through concurrent data collection, analysis, coding, and conceptual categorization; identifying and making visible the researcher's perspectives and role in the research process; and recognizing and interacting with multiple realities, insights, experiences in order to shape a context-specific theory.   Unlike the positions of Glaser and Strauss that theory emerges from data irrespective of the objective researcher, CGT relies on pragmatism and interpretivism as well as engagement of the researcher in the worlds of the participants which ultimately allows the researcher's perspectives to frame or at least be clearly articulated in the research. CGT forwards the ontology and epistemology of Strauss by adopting a relativist perspective highlighting multiplicity, subjectivity, interactivity, and reflexivity, a perspective well-suited to the firefighter context. Also, CGT aims for interpretive understandings and not generalizations which may be limited by contexts, and means that there is room for a collaborative creation of a theory of resilience in volunteer firefighters.

CGT expands on GT methods: data collection with concurrent analysis, initial coding, focused coding, memo-writing, constant comparison, theoretical sampling, theorizing and construction of theory, and knowledge translation through writing and dissemination (Charmaz, 2014, p. 18) which again is in keeping with the overall conduct of PhD research, and specifically my interest in resilience in firefighters.

CGT explicates the position of the researcher, and I expected that I would continually reflect upon underlying assumptions in order to heighten awareness by being open to, listening to, and analysing participants voices and stories (Mills, Bonner, & Francis, 2006a); CGT does not presume I would be able to maintain distance or objectivity from the participants or the data, instead integrating "relativity and reflexivity" (Charmaz, 2011, p. 365) through the whole of the research process. CGT's relativism and subjectivism shaped the interactions

between myself and data, and the co-occurring analysis required ongoing collaboration between myself, participants, and data. CGT provided opportunity to "transform knowledge" (Charmaz, 2014, p. 340) through reflection on the interplay between myself, the data, the participants, and the reflexive process.

5.4.c   Reflexivity

Reflexivity is a key concept in CGT, but as noted by Freshwater and Rolfe (2001, p. 529) has "neither unanimous nor harmonious" definitions. Reflexivity has been variously defined as: a process of evaluating and developing awareness of self (Shaw, 2010); a critical look at relationships and circumstances in order to change our ways of relating (Cunliffe, 2009); reflection-in-action (Schon, 1987); and a process of developing self-awareness about the researcher's influence on the data (Clancy, 2013). Reflexivity has been described as a key to researcher self-awareness and the ability to recognize how data and analysis can be influenced and/or limited by the researcher's knowledge, biases, and behaviours. Reflexivity is a common and expected phenomenon in nursing (see for example: Benner, 1984; Burns et al., 2012; Freshwater & Rolfe, 2001) and involves actively questioning one's values, beliefs, attitudes, actions, reactions, and assumptions in order to understand and forefront how those influence nursing theory and practice. Reflexivity is an ongoing examination of the researcher's position (Clancy, 2013) or stance (Charmaz, 2014) knowing that stance informs study conduct, relationships with participants, and representation of participants' stories. Reflexivity helps to keep the researcher "engaged and interacting with the data and the emerging idea" (El-Hussein et al., 2014) instead of disengaging and distancing as suggested by traditional GT researchers (see for example: Glaser & Strauss, 1967). Factors to consider in positionality include gender, ethnicity, age, cultural similarities/differences, power relationships, and the role of researcher to participants which is referred to as "insider/outsider positions" (Burns et al., 2012, p. 53).

Insider/outsider positions

Relevant to this research is my 20 years as a clinical consultant to FRS in Canada, a male-dominated profession that situated me as an outsider by virtue of my female gender yet having insider knowledge bestowed upon me within the professional relationships

developed over years of working with firefighters. The insider role defined by the prior relationship with the FRS was advantageous in this research but vigilance was necessary in order to minimize problems such as role conflict. Advantages to the insider role included: common language and understanding of the culture and ways-of-being of members of the FRS; shared experience and knowledge of emergency policies, procedures, and processes which are similar between nursing and the FRS; ready access to firefighters and their workplace; and an existing trusting relationship with many FRS which supported easy movement into what may be considered difficult conversations focused on stress reactions that are often emotional and cognitive in nature – common topics for discussion between firefighters and me yet uncommon in other settings and relationships. As well, the salutogenic and 'health' frame of reference of my clinical nursing practice is a value shared with firefighters as evidenced by their willingness to talk about workplace health, coping, and resilience, ultimately leading to the firefighter-defined research question: far more firefighters remain healthy over the course of their careers than become ill – how do they do that? These advantages allowed for an easy transition to the research interviews.

Potential challenges accompanying the insider role included: boundary transgressions by either myself or the firefighters – a 'drift' into therapeutic conversation instead of inquiry or research and/or 'drift' into more social or unrelated conversation; "over-identification" (Burns et al., 2012, p. 53) with participants when they were describing stress reactions and coping strategies; my biases/assumptions that I brought from previous experience as nurse, researcher, critical incident stress management (CISM) educator and service provider to firefighters; and role confusion for participants about my role as researcher vs. therapist. These proved to be non-issues in the interviews largely because of vigilance, reflexivity, and discussions with supervisors. Other potential challenges that the reflexive process addressed included some known risks for novice CGT researchers such as recording superficial data and analysis that lacked depth, rushing to theory construction, not using reflexivity, etc. which had happened in my previous research. All of these issues relate to validity hence not only was consideration given to these, but criteria to evaluate the study were also established: credibility, originality, resonance, and usefulness; these will be discussed further in the next chapter (see section 6.5). In-depth ongoing discussions of those potential challenges with my supervisory committee minimized the chance that the research process would be

compromised, and ensured depth and breadth of data analysis that led to construction of a robust theory.

5.4.d   Rationale For Literature Review

Critical to classic grounded theory is the delay in reviewing literature (Glaser, 2004; Glaser & Strauss, 1967; Strauss & Corbin, 1994) in order to avoid having the researcher's preconceptions unduly influence the research, and/or the researcher 'forcing' the data into extant theory. In contrast, however, CGT does not delay the literature review. Charmaz (2014), Dunne (2011) and Thornberg (2012) realistically contend that researchers do not come to their research as blank slates; instead they are: experts in their own fields thereby familiar with evidence in the field; reasonably well-read and educated in their own field hence coming to research with some preconceived ideas and questions; aware of the existing knowledge/theory in the field; and aware of extant theories that challenge or support their questions. Dunne (2011) notes "the idea that any researcher undertakes a study without some level of prior knowledge or ideas is simply unrealistic" (p. 117); individuals cannot go back to unknowing but can be aware of their knowledge base and how it may influence current questions, research, and interactions.

Thornberg (2012) suggests "informed grounded theory" (p. 243) in which the research process and the outcomes have been grounded in data through GT methods concurrent to "being informed by existing research literature and theoretical frameworks" (p. 249). He offers several principles related to theoretical sampling of literature, using memo's to note associations with extant knowledge, and ongoing reflexivity in order to take advantage of extant literature and theories in a critical and flexible way.   These principles allowed me to be aware of and utilize my pre-existing knowledge of health, resilience, and firefighters to enhance, refine, and challenge current knowledge; in the context of the current study, the principles also helped me remain open and sensitive to the incoming data, prevented me from forcing data, and avoided or surfaced my assumptions.

5.4.e   Position Of The Researcher – Situatedness Of Self

Recognizing the influences of nursing theorists on my nursing career as well as the influences of historical models of nursing practice on my way of viewing knowledge and the world has

led to a constructivist way-of-being. The constructivist paradigm situated me in a combined relativist ontology that recognized multiple realities both my own and the firefighters', a subjective and co-creative epistemology that centred participants in the research process and recognized my involvement in constructing and interpreting data. Methods were inductive and constructive as I considered the perspectives of firefighters and subjected my data to rigorous comparisons in order to develop (Charmaz, 2014, p. 15) substantive theory, ultimately relying on the study to inform policy and practice in the FRS.

5.5   CONDUCT OF THE RESEARCH

This study did not explicitly seek to control factors or variables. It instead looked at relationships, and the study was designed to examine the relationship between firefighters, work stress and resilience using CGT. Prior to undertaking the study, issues of homogeneity, criteria for inclusion in the research, interviewing in the field, and methods were considered.

5.5.a. Homogeneity

Homogeneity in this case does not refer to personality traits as reviewed by Wagner (2005), but in a sample of firefighters, homogeneity refers to an expected commonality of task, function, job description, expectations, and culture. In this case, the volunteer FRS involved in the study is considered to be a homogeneous sample. As discussed in section 4.13, there are a number of factors that account for TBFRS' typicality (demographics of community and FRS membership, geographical elements, provision of service within one's own community, etc.) and even though TBFRS is innovative in its health promotion, it is not unique to volunteer FRS in Canada hence this innovation does not detract from the homogeneity of the FRS and firefighter sample.

5.5.b   Criteria For Inclusion In The Research

The inclusion criteria for the sample were:

i.   The FRS is a 'volunteer' department. This criteria spoke to homogeneity of roles, responsibilities, and the unique stressors associated with being a volunteer firefighter.

ii.   Project participation was available to all members of the FRS, including management and command structure, as well as all trades (operations, prevention, control,

training, command, etc.). This criteria addressed concerns about inclusion/exclusion of members, as well as recommendations from other researchers (see for example: Shepherd, 2005) for inclusion of all 'levels' of the organizational hierarchy.

iii. The department serves urban and rural geographical areas. Rural FRS in other countries often experience a lower call volume; however, in the Canadian FRS participating in the study, there is a high volume of calls related to road traffic accidents on an adjacent major thoroughfare as well as the more traditional 'fire', first responder, and medical aid calls.

iv. The FRS has a Critical Incident Stress Management (CISM) or similar stress support program. This criteria related to overall levels of stress education within the FRS, and a common understanding about stress and workplace trauma concepts and terminology. This criteria also ensured that should 'trigger effects' occur when TBFRS participants are talking with the researcher, a trusted accessible referral process was available.

v. The department needed to be geographically accessible to me as the researcher in order to facilitate access to the organization, facilitation of interviews and meetings, etc.; I have easy access to FRS in western Canada.

vi. Participation was restricted to Canadian firefighters for a couple of reasons: the research began in Canada because I have ready access to Canadian firefighters, and the sources of stress are different for Canadian firefighters than for UK, Malaysian, or American firefighters (Blaney, 2009; Malek, Mearns, & Flin, 2010); working with a single country supports homogeneity and does not confound the research with potential cross-country differences – however, this makes subsequent research across various contexts (culture, country, etc.) critical.

5.5.c Interviewing In The Field

Charmaz (2005, 2006, 2008) summarizes six key concepts of grounded theory which framed the interview method with firefighters:

a) *Establish intimacy with the setting, events, and participants*: I have over 20 years' experience within FRS in Canada, and research experience with five FRS in Canada and the U.K. Utility of this research required full engagement with the FRS and entailed training with, talking with, and inquiring of firefighters – meaning rapport,

credibility, trust, and a level of professional intimacy had to be quickly established; I have built and maintain working relationships with FRS which are foundational to grounded theory overall and to this programme of research specifically.

b) *Respect the research participants*: Mining for data can never take precedence over the comfort of participants; I remained sensitive to the nuances indicating discomfort, allowed participants to explore the issue creating the sense of dis-ease but also ensured that any distress was debriefed prior to the end of interview. There was a natural flow to the interviews and participants readily expressed emotions (laughter, tears, anger) in ways that 'fit' with the topic under discussion; those emotions ebbed and flowed throughout the more intimate setting of the interview yet transitioned naturally to a more 'social' experience as the interview drew to a close.

c) *Focus on meaning and process*: I asked what health means to firefighters; how do firefighters define resilience; how does one become resilient in the FRS; and how can individual resilience contribute to organizational resilience? Again, these questions underpinned the aims of the research yet required relational practice in order to explore meaning and processes in depth with participants.

d) *Engage in a study of 'action'*: I asked about resilient actions in the FRS; how are those resilient actions actively sustained? This research explicates these questions in a context that has not previously been explored – healthy adults in a high-risk occupation.

e) *Investigate and articulate the social context* for the actions: Engagement in the relationships and inter-relationships of people and actions within the FRS not only demonstrated the complexity inherent in high-risk professions, but also explicated the context and culture of the FRS. Tensions are known to exist between the public perception of firefighters as 'heroes' and the firefighter perception of 'just doing my job'; some firefighters embrace the hero mythology, some flinch from it, and some simply refuse to acknowledge it (Lewis, Tenzer, & Harrison, 1999). Underlying the hero-myth is an individual who is trying to keep their community safe, providing service rather than heroics. This is one example of the social context of the FRS that may influence health and resilience.

f) *Being attentive to language*: Being attentive to language and silence in the context of

FRS required mutual trust in order to ask/answer questions of a sensitive nature. Attention to language allowed more in-depth exploration of personal resources, actions, thoughts, and reactions. Charmaz (2014) further suggests the need to "note those who choose to remain silent, as well as those who have been silenced" (p. 527), hence making use of both the stories and the silences, exploring the meaning of silence and asking: is silence used to control information, avoid action, and/or impart a message?

5.6   CHAPTER SUMMARY

In this chapter, I have discussed some of the theorists and perspectives that influence my position as a researcher: multiple realities and perspectives, an overt valuing of 'voices' and constructed perspectives, and interest in health and salutogenesis as well as in the relationships between people/organizations and their health/resilience, cultural practices, etc. Constructivist grounded theory as the methodology of choice for the programme of study was described and discussed. In keeping with these influences, this research was originally situated within an interdisciplinary context but the process evolved to one of transdisciplinarity. The unanswered questions about health in the FRS inspired this research, and also guided the choice of methodology. A history of GT was provided and the rationale for CGT was described. The research questions were reviewed and specific aspects of research conduct such as criteria for inclusion in the study, and issues related to field interviews were discussed. The following chapter will look at study conduct, research participants, criteria for judging the quality of the research, and the clinical governance process.

CHAPTER 6: STUDY METHODS

6.1   OVERVIEW

This chapter describes the methods of the research, examining procedures for participant recruitment, construction and conduct of interviews, and the processes of concurrent data collection and analysis. Methods of analysis will be discussed including initial coding, focused coding, memo'ing, theoretical sampling, etc. This chapter concludes with a description of criteria to evaluate the constructivist grounded theory research, as well as the process of clinical governance.

6.2   PROCEDURE

6.2.a   Participant Recruitment

Sampling was purposive and taken from FRS that met the criteria for study participation (see section 5.5.b). TBFRS was chosen because it met all inclusion criteria and is representative of volunteer FRS in B.C. (see section 4.13).

Initially the idea of research was introduced to the FRS by three members of the FRS who act as peer support for the critical incident stress program and are well-respected within the FRS; I am well-known to the FRS, and other members had already indicated an interest in participating in health-related research. I attended the FRS monthly training session where attendance is mandatory for all members, and formally introduced the project. I explained the research aims, the research process, and the ethical obligations and processes such as consent. I asked members to contact me via private email to indicate their interest and to provide me with contact information. I then replied to the phone/email to set up an interview at a mutually convenient time and in a private location of the participant's choice. Eight participants within the TBFRS were chosen purposively from those who came forward in order to ensure a range of age, gender, rank, and years of service.

Sampling arises from the research questions; purposive sampling was chosen because it reaches a target population with specific characteristics – in this case volunteer firefighters from a single FRS. In keeping with the research questions, purposive sampling allowed for detailed insights within this population and generated robust credible data. Within CGT, and

depending on the initial and follow-up questions, a small sample size can create very robust data (Charmaz, 2014) as was the case in this study; the small sample size was intentional and in keeping with CGT principles and practices. The interview guide will be discussed further in sections 6.3.a.

6.2.b Participants

When I was initially thinking about describing the participants in this study, I had intended to provide narrative 'portraits' of each firefighter (Lawrence-Lightfoot & Davis, 1997), assigning pseudonyms and using demographic information such as gender, age, relationship status, years of service, etc. to create a meaningful picture of each firefighter. As I was rendering the pictures however it became very clear that each participant would be easily identifiable to other members of the TBFRS. Even though the anonymity of the FRS itself was protected by the reasonably vague geographical descriptors previously articulated, every member of this FRS knew that research was being conducted and could easily recognize their colleagues from the word pictures. Although each participant said they were unconcerned with being identified by colleagues, I felt a strong ethical obligation to maintain anonymity. Therefore, participant demographics are described in aggregate below, with each participant being randomly assigned a gender-neutral pseudonym for purposes of citation in the thesis.

The male and female participants in this research range in age from early 20's to mid-60's with a mean age of 48 years, and their years of service in the FRS range from about 4 to upwards of 30 years, a mean of 20 years. Some are married or in committed intimate relationships whereas others are single. Two are retired from full-time paid work but have taken on extra tasks/roles at the FRS so they are essentially working fulltime as volunteers. Four of the eight participants have had experience in career FRS prior to coming to TBFRS. The majority of the participants (6) have full-time paid occupations outside of the FRS in retail, management, or health/social services. All are involved in other volunteer work in the community besides the FRS (i.e. children's sports teams, seniors' organizations, church groups, and search-&-rescue, ski patrol, etc.) meaning they are in constant negotiation with their families, employers, and other volunteer organizations to prioritize their overall time but especially their time with the FRS. All live either within the geographic confines of the community or within 10 minutes from the FRS, meaning they are in routine interaction with

community members when they are 'off-duty'. *Communication* was noted by all participants as the key to successfully navigating their family, professional, and volunteer lives, with the theme of negotiation being offered spontaneously in interviews when participants were describing the demands of the FRS beyond being 'on-call'. Individually and collectively I find the participants to be caring, compassionate, committed service providers who dance, sometimes intuitively and sometimes with rational practiced steps, among multiple roles and responsibilities; the 'dance' is sometimes stress-inducing in-&-of itself, but navigating the steps provide full and fulfilling lives in and out of the FRS according to the research participants. Participants were assigned the following pseudonyms: Frankie, Shawn, Sam, Chris, Bobbi, Jamie, Andy, and Max.

As the research project was developing, I also sought an external participant, an Assistant Chief (career firefighter) of an unrelated volunteer FRS from another part of British Columbia in order to both challenge and possibly support the evolving grounded theory. This individual (pseudonym became 'Danny') had provided me with a 'practice' interview prior to the start of data collection with TBFRS in order to assess the relevance and credibility of the interview schedule. I treated the 'practice' interview as if it were an actual interview, providing Danny with information on the research, gaining consent through use of the same consent form as subsequent participants, and using the interview schedule to guide the discussion. I transcribed the interview, recognizing how labour-intensive this task was (subsequently hiring a transcriptionist for the other interviews) and began initial coding and memo'ing which I discussed with my supervisory committee; some themes were emerging but primarily the practice interview provided direction for the interview guide. I then put it aside until I had completed all the interviews with TBFRS and a grounded theory was emerging. When I was doing theoretical sampling with TBFRS data, I went back to the practice interview and considered 'here is what emerged in TBFRS; now how does what I learned from Danny in the context of an external firefighter compare/contrast to the theory of resilience in TBFRS?'; this process provided verification of the developing grounded theory thus reinforcing its originality, credibility, resonance, and usefulness. I had thought that different perspectives might emerge from interviews from different yet culturally similar contexts hence providing triangulation but that was not the case; instead, Danny's perspective reinforced the perspectives of TBFRS' members and provided depth and breadth

to the grounded theory.

I also had an independent researcher act as a 'critical friend' and a second set of eyes on the categories and sub-categories; this was the critical friend who filled the same role on my previous research projects (Blaney, 2006, 2012). The critical friend is a research assistant in addictions research, and has also provided clinical psychology services to emergency services and military personnel hence understands the research process as well as the culture and language of the FRS; the friend's pseudonym is Taylor. Having someone who was external to the research process helped me avoid idiosyncratic analysis and also provided constructive critique of theory as it was evolving; I would find questions on post-it notes attached to the wall charts of the data (i.e. 'what does this mean?' 'how do these [data] relate?').

Once the data collection, analysis and theory construction had occurred, I went back to both of these 'external' participants and conducted an interview that was guided by the questions of the 3rd interview with TBFRS participants (see Appendix V); this process provided further evidence of originality, credibility, resonance, and usefulness (criteria for evaluating CGT as discussed further in section 6.5) from outside TBFRS and contributed more depth and breadth to the theory.

6.3 INTERVIEWS

6.3.a Interview Guide

A semi-structured interview guide was developed in consultation with the supervisory committee and piloted with personnel from outside the FRS under study to ensure congruence and meaning of language; there were a number of 'target' or key questions that related to stress and coping, but generally the intent of the questions was to frame a free-flowing conversation with firefighters in which I led minimally and 'got out of the way' of the participants' narratives. The questions minimized researcher bias by using neutral language, and allowed for narrative replies to open-ended questions hence increasing the depth of response. The interview questions needed to be considered ahead of time in order to ensure that there was some structure to the interviews, to keep the conversations focused on the research questions, and to allow the conversation to be brought back to 'topic' without me leading too directly (Charmaz, 2014). Construction of the interview guide took

time, with several iterations going back-&-forth between myself and members of the committee; this in itself was a reflexive process that allowed for construction of a basic framework of questions to be asked in interview that were relevant to the research questions, as opposed to a social conversation. Consideration was given to a context for interviews such as: pacing before asking hard/intrusive questions; the use of observation of verbal and non-verbal responses; use of journal/memos to capture the observations; use of a Rogerian style of interview (Rogers, 1961), that was non-directive, participant-centred, strengths-based, used open-ended questions, reflected participants' words/feelings, and included unconditional positive regard and genuineness on my part; built on my previous experience as therapist, critical incident stress management provider and nurse; and the underlying requirement for firefighter 'voices' to come through in the research. However, the interview guide was only a frame for the discourse that occurred between the participants and me through "the open interchange between participant and researcher... data generation as opposed to data collection" (Mills, Bonner, and Francis, 2006a, p. 10).

The interview guide was piloted with two people who were not part of the research project but agreed to provide feedback on the interview, resulting in some further adaptations/iterations of the interview; one is a firefighter and the other is my critical friend and both understand firefighter-specific language that is part of the interview guide. Interviews were two-faceted: face-to-face, and asynchronous electronic interviews (e-interviews). All interviews were minimally structured however in order to allow the participants to take the conversation where they wanted it to go; my job as the researcher was to listen, clarify, and, be sensitive to how I was guiding/leading the interview.

One issue that required much reflection was that of professional boundaries, and how to create and maintain those so that I did not become immersed in the emotion of the stories but did not set up a power imbalance by trying to remain too objective. Collins (1998), in his online forum, considers research interviews to be mutually constructed yet uniquely existential events; it was important to recognize that although each interview would be unique, the partnerships that developed during those conversations would have risks and benefits. Gardner, Fedoruk, and McCutcheon (2013) compared and contrasted research interviews with therapeutic alliances that develop between mental health therapists and

clients, noting that the therapeutic relationship and the research relationship both require the establishment of trust and the development of boundaries. It is the clinician's hence the researcher's responsibility to establish and maintain professional boundaries, a difficult dance that required self-awareness and ongoing reflexivity. Collins goes on to explain the various roles played by interviewers such as witness, sounding board, confessor, confidant, and/or go-between, and notes these roles have been described in negative terms and as barriers to research; he concludes that "it is both pointless and unhelpful to deny the roles one is expected to play, the selves that are jointly negotiated" (para. 3.33), suggesting instead that we focus less on the product of interviewing and more on the process such as the negotiation of roles. I find it disturbing that although many authors discuss in detail the need for the researcher to be fully engaged with the researched, Collins (1998) and Gardner, Fedoruk, and McCutcheon (2013) are very much in the minority in explicating the potential negative impact of this relationship on the researcher. Mosselson (2010) eloquently describes her own reactions to interviewing: nightmares, "emotionality" (p. 490), the challenge to managing her own reactions while still keeping the research focused on the participants, and the multiple tensions that arose in the research process; she notes that reflexivity allowed her make meaning of the complexities "with a supportive lens on both the individual and the research practice" (p. 493). Using reflexivity not only assisted me during data collection and analysis, but also allowed these 'process' tensions to be surfaced and reflected upon and dealt with as they arose hence enhancing the overall research process.

6.3.b Face-to-face Interviews

Face-to-face interviews were conducted over a seven month period in 2015. Interviews took place in various settings chosen by participants and included: coffee shops, private office at my home university, and participants' homes; each required consideration of privacy in the context of the general public's and/or family members' presence in the vicinity. The start point of every interview was a brief overview of the research question(s), an appreciation of the firefighter's participation, and a review and signature of the consent form which also functioned as the participant information sheet; copies of the form were offered to, and declined by, all participants.

The interview guide evolved in response to the emerging data (Charmaz, 2014). The interview guide was initially constructed as a start point which set out the areas of inquiry and fundamental issues (the research questions). It was used as a flexible tool that was revised as data, codes, and categories emerged through analysis, constant comparison, and reflexivity. Intensive interviews are intended to explore rather than interrogate and the interview guide allowed the interviews to be open-ended yet focused on significant issues/ideas that arose. In CGT, the interviews offer iterative emergent categories and concepts, and subsequent interviews are aimed at saturating and refining those categories. The challenge is to ensure that categories are saturated rather than simply adding more volume of data, hence the interview guides must be flexible and continually evolve in response to the concurrent data analysis of participants' perspectives. Going back to the participants multiple times enables depth and breadth to the iterative process; interviews continue until there is saturation of the categories and concepts (Charmaz, 2014) which in this case occurred within the 45 hours of interviews. For the purpose of this thesis, the examples of interview guides in Appendix IV and V are the fifth and third (respectively) iterations of interview questions, and show the evolution not only of the questions but of the depth and breadth of the interviews in response to the analysis of previous interviews. In the appendices of the thesis, the original questions are bolded and the subsequent iterations are italicized in the appended examples to help demonstrate the evolution of the interviews.

At the end of each interview, the interview and consent were assigned a random code in order to protect anonymity, and the consent was scanned to a secure file on my computer; the hard copy was filed in a locked drawer in my home office. The interviews were conducted loosely following the interview guides (attached as Appendix IV and Appendix V). However I tried to allow the conversations to unfold as the participant wished, only re-directing if it seemed as if we were wandering into non-research-related domains; participants were very willing and able to have wide-ranging discussions that had meaning to the participants and upon review generally remained focused on resilience and the volunteer fire service.

The interviews were digitally audio-recorded and took from 1.5-2.5 hours each. Once the

interviews were completed, I immediately made notes on ambience, location, background noise and/or other distractions, personal perceptions of barriers to or ease of the interview, and my emotional and cognitive reactions to the interview. Within 24 hours, I transferred the interview onto my home computer, erased it from the recorder, and listened to it to ensure the recording was of quality for the transcriptionist. The interviews were uploaded as wave files to a secure (password protected) wiki that only the transcriptionist and I have access to. The transcriptionist had been recruited from a list of recommendations from other PhD students and was known to me as skilled at transcription and able to maintain confidentiality; the transcriptionist was amenable to signing a confidentiality agreement and was paid a mutually agreed upon hourly rate for each interview. I checked in with the transcriptionist by email at the end of each transcription to ensure that she experienced no untoward reactions to the content of the interviews, either the described incidents or the reactions of people being interviewed. The transcriptionist readily shared the strategies being used to 'blow off' reactions to being immersed in the stories of firefighters and only once was unduly affected by an account of rescue of someone who was known to the transcriptionist; we spoke by phone shortly afterwards and I was reassured that there were no lingering effects.

6.3.c   Asynchronous e-interviews

Asynchronous electronic interviews were used as an adjunct to face-to-face interviews, in order to follow-up, clarify, and explore in more depth. Asynchronous interview allowed both the participant and myself time for reflection between questions and answers (MacNeill, Cavanagh, & Reynolds, 2009); in allowing reflection and re-reflection of questions and themes, experiences are described in "the most faithful way possible" (Munhall, p. 2012, p. 540) and allowed for clarification, increased depth of thought and considered responses. Initially I was not convinced that e-interviews would work with firefighters; the majority do not use messaging or email for in-depth communication, but each said during the first interview that they would be open to follow-up by email. It seemed to work well to use face-to-face conversations to establish research rapport and to negotiate the research relationship as well as to allow for questions about the process to be asked/answered in-the-moment; although I knew some of the participants through our mutual involvement in CISM, many only knew me as the 'mental health person' who appeared at the station following a

117

traumatic event.   Negotiating the research relationship was not difficult however as I simply asked participants at the start of each interview to talk to me as if I knew nothing about firefighting, the FRS overall, and had no knowledge about this particular FRS; this boundary-setting worked well and most spoke to me as if I knew nothing, taking time during the interviews to spontaneously explain acronyms, processes, roles, etc.

The asynchronous e-interviews were a convenient tool that helped me with time-management and to stay connected with participants after the initial interviews; I was very reluctant at first to consider using asynchronous e-interviews and developed a number of arguments to avoid them. The potential barriers of missing the firefighters' voices, cues, and stories proved to be non-issues however and the e-interviews kept me connected to the participants and the participants connected with the research. The interviews, transcription, initial coding and analysis took well over six months and I felt that I was leaving the participants 'hanging' because I wasn't ready to do follow-up interviews in a timely manner. I began emailing them individually with the same message providing them with updates on the research process, and reassuring them that I was still working diligently and would get back to them as quickly as possible with the follow-up questions. Participants were unfailingly supportive and understanding of the timeline, and expressed gratitude for the updates and reassurance for their ongoing participation whenever I was ready.

6.3.d   Follow-up Interviews

There were at least two follow-up interviews offered to participants (see Appendix V). Six of the eight original firefighters responded to the emailed request for a follow-up; two did not answer the email request for another interview and did not respond to a third email that softly suggested that a non-response would be taken as a withdrawal from the study. All six participants requested face-to-face interviews for follow-up; these took place as per the initial interview at a location of the firefighter's choice. The follow-up interviews were also audio-recorded over a 1-2 hour period, and I transcribed these myself using a focused or thematic process since the questions themselves were focused. Once these were transcribed, the coding process moved fairly quickly due to familiarity with the data; concurrent data collection and data analysis also happened at this stage as data, codes, and emerging theory was integrated with the latest data from the second interview. Data from

the first and second interviews is included in the thesis in the form of interview excerpts in chapters seven and eight, and shows the emergence of the theory from the data.

A third interview took place with each participant towards the end of the data collection process in order to present the grounded theory of resilience. These interviews were also audio-taped, took about an hour, and were transcribed by me; again, they were analysed more grossly than line-by-line, searching for key words, themes, and ideas that had been found in previous data but also being aware of any possible outliers or negative cases. The third interview was structured as more of a 'presentation' of the theory to each participant, and a question/answer period that took up the majority of the interview. I found this process to be very helpful in articulating the findings as they emerged from the data, and to ensure that the constant comparison between my thoughts/ideas/emergent theory were reflective of, and relevant to, the firefighters' perspectives of resilience.

The interviews were flexible in that I had an interview guide and several questions that I wanted to ask in each interview, but the conversations flowed naturally and were generally led by the participant. I occasionally re-directed or clarified, but the prepared questions from the interview guide often arose spontaneously in discussion of another topic. For example, when asking about coping strategies, participants often mentioned the culture of the FRS; this led to more focused questions about culture which further led into conversation about leadership, knowledge, experience, etc. Being able to 'go with the flow' and letting the participants lead the interview provided greater depth and breadth of data, and was in keeping with my epistemological and ontological perspectives of relativism and subjectivisim in the co-creation of knowledge; relational practice, 'unknowing', and valuing diverse perspectives were strengths that I brought to the data collection process.

6.4   CONCURRENT DATA COLLECTION AND ANALYSIS

There were more than 45 hours of interviews across one to three face-to-face interviews and additional asynchronous interviews resulting in rich robust data. The process of analysis was concurrent with data collection and iterative as I interacted with the data through review and re-review of the data and use of methods such as coding, memo'ing, and theoretical sampling. Charmaz describes grounded theory as a "constellation of methods" (2014, p. 14)

that draws on various strategies or actions such as: coding, writing memos, theoretical sampling and saturation, sorting and categorizing memos and codes (Charmaz, 2011). Although Charmaz suggests that not everyone using grounded theory methods wishes to construct theory, for those that do, CGT emphasizes theory construction through theoretical sampling, saturation, sorting, and the "search for variation in...categories or process" (Charmaz, 2014, p. 15) in order to construct and reconstruct theory; these methods were evident and purposeful throughout this programme of study. The CGT methods presented in the following sections are done so in a very linear fashion but in practice were simultaneous as described in the previous section. Although described as a constellation, I see the CGT process as more helical, a three-dimensional coil or spiral in constant motion as data is constantly analysed, coded, re-coded, and theorized; this symbolic rendering of the process proved helpful in minimizing the sense of being overwhelmed with the daunting task of using CGT to study firefighter experiences and meanings.

The methods used to construct the grounded theory of firefighter resilience will be discussed in the following sections of this chapter.

6.4.a   Initial Coding

Coding, in a grounded theory context, is described by Charmaz as the 'link' (2014, p. 113) between the data collected and the emerging theory that explains the data. CGT coding requires two stages: the initial coding where data is named by line; and 'focused' coding where the most frequently used initial codes are used to "sort, synthesize, integrate, and organize" (Charmaz, p. 113) data. In this study, the codes were constructed through my naming of the data; this interpretive process allowed the codes to be defined, refined, and re-looked at as data was explored in more depth and questions arose and were subsequently answered and/or checked for accuracy with participants and with my own interaction with data. Comparing data and codes, and comparing between data transformed my understanding of the world of firefighters. A challenge that I found was ensuring that my initial coding of the piloted interviews arose from the data and allowed me to create codes, and not simply applying preconceived understanding or themes to the data. Continual reflexivity that questioned 'where is this code coming from?' helped ensure I did not force data and allowed the codes to emerge from the data. Another challenge was to keep initial

codes simple and not to look for or use complex terms/names or to jump too quickly into categorizing data, but to simply interact with the data and allow new questions to emerge as I sought more in-depth understanding.

Initial coding, sometimes called "open coding" (Thornberg & Charmaz, 2012, p. 44) occurred shortly after I transcribed the interviews; there was a two-column form with the transcribed data in one column and my initial codes in the other. Concurrently, I was writing memos and journal entries with questions, dilemmas, challenges, and understandings, and reviewing those as I moved into more focused coding. Initial coding allowed me to develop some direction for further analysis and formed the "skeleton" (Charmaz, 2014, p. 113) of the theory; a challenge was again to allow the process to remain open to various theoretical directions and not to rush into focus or theory. The intent of coding was to begin to "understand acts and accounts, scenes and view [and] try to understand participants' standpoints and situations as well as their actions within the setting" (Charmaz, p. 114). Even though I thought I knew the FRS and firefighters reasonably well, the process of initial coding provided new insights and appreciations.

Charmaz suggests line-by-line coding and encourages keeping codes simple, short, active, and analytic in order to enter into and interact with the data; the use of "gerunds" (p. 120) offered life and sequence to the data, and line-by-line coding suggested what other kinds of data needs to be collected hence directed the inquiry. I found gerunds to be particularly helpful for initial codes – the gerunds were 'action' words of the participants and that action-orientation allowed me to look at their experience in different ways. Initially I was simply regurgitating the words of participants but with support from my supervisor to use gerunds, ultimately I was better able to remain close to the data, see the underlying processes, and yet still see the world through the participant's eyes.

Ongoing coding and recoding occurred as the codes were constantly compared before being grouped or focused into increasingly abstract categories. The process of coding seems somewhat simple when described here, but in practice was an evolving process that went beyond sorting and synthesizing to unifying and linking ideas, making connections between ideas, and considering possible theoretical meanings (Charmaz, p. 137). Thornberg (2012)

and Charmaz (2014) advocate "theoretical playfulness" as a method to enhance abduction, creativity, critical thinking, and the making of connections with data and with extant theories. This initially seemed like a good strategy to use to also avoid being 'stuck' in data and/or being overwhelmed by the research process, however the amount of data, and the energy and focus required to capture perspectives, engage in reflexivity, and become more abstract did not leave room for playfulness – it was an intense time and respite only came when I disengaged from the research and engaged in some unrelated activity such as walking my dog.

6.4.b   Memo-writing

Memo-writing is pivotal in CGT as "the intermediate step between data collection and writing drafts of papers' (Charmaz, 2014, p. 162) and was intended to allow me to analyse my thoughts and ideas about coding as those thoughts arose in-the-moment, and to encourage constant data comparison and code analysis.   The pilot interviews served a very useful purpose in allowing for a 'practice run' at interviewing, transcription, initial and focused coding, memo-writing, and journaling. My research journal served as more of a reflective tool that provided opportunity to note the tone and location of interviews, and non-verbal cues, as well as allowing questions about my position as researcher to be articulated and considered. The journal reflected the questions, changing directions of interviews, and my evolving understandings and challenges. It highlighted my immediate reactions to what occurred in the interviews, and upon re-reflection showed personal themes and reactions; as well it raised thematic questions about the data and participants. Throughout the research, the journal showed my preconceived notions very clearly and quickly through the language that I used; that language was often a product of my existing knowledge about the person I was interviewing, and about stress, coping, and resilience as opposed to the participants' language. The journal allowed for my assumptions, ideas, and questions to become visible, and the memos and journal ended up being combined in order to simplify the reflexive process and consolidate ideas.

I understand that memo writing serves multiple analytic purposes. Memos are spontaneous and informal, and guide and direct the researcher's actions (Charmaz, 2014) as well as analyse participants' actions. Memos are also reflexive tools that not only reflect the

processes of research but my subjectivity within and beyond the research. However, memo'ing remained a work-in-progress for me throughout the research. It was very challenging to find a memo process that was functional and allowed for reflexivity without distracting me from the interplay between myself, the data, and the emerging theory; I was very distracted by trying to find the 'right way' to memo, and kept losing the essence of the data and my relationship with it. I explored a number of suggestions from my supervisors and from various authors (Charmaz, 2014; Birks, Chapman, & Francis, 2008) who all recommended using a 'system' of memo'ing that included consistent form and structure, but I could not find a model that fit my style. I ended up using a combination of techniques: a narrative approach by jotting ideas in my research journal and linking those with each other and/or extant literature; wall charts of hand-written data taken directly from the coded interviews; and diagrams that evolved from the wall charts, journal entries, and a free-thinking method of simply looking at the data on the wall charts and creating links with string showing the relationships between codes and original data. Each process allowed for reflexivity and ultimately was very effective in finding meaning and relationships in the data but did not feel particularly systematic at the time. A brief excerpt of my research journal (see Appendix VI) offers examples of how the analysis moved back and forth between pragmatics and abstraction through questioning the data, integrating extant theory, and comparing/contrasting/questioning specific extracts of participant data.

6.4.c   Focused Coding, Clusters, And Categories

Focused coding took the initial codes from the transcribed documents and subsumed them into increasingly conceptual codes that categorized data more completely; at times it required coding my initial codes (Charmaz, 2014, p.138). I used large pieces of flipchart paper, hand-written multi-coloured moveable notes and symbols alongside the transcribed coded antecedents to 'drill down' and/or highlight important findings in the data and the initial codes, and to 'cluster' or group the data. Extrapolated from Charmaz, the following questions were helpful in making meaning of the initial codes and engaging in focused coding: which of the initial codes best represent the data; what patterns are revealed in the initial codes; what gaps in the data are revealed by both the initial and the focused codes; what am I finding when I compare initial codes to the data?

Focused coding required tentative decisions about which data is meaningful and allowed me to "move out of immersion...into analysis" (p. 144) creating space for greater theoretical sensitivity and capacity for conceptualizing the codes. Using diagrammatic representations of clusters helped to raise the clusters into categories; the diagrams were initially simple circles containing clusters of data, but became more sophisticated as core categories emerged and interactions between and among the categories became evident. Unlike classic grounded theory that requires a "core category" (Glaser, 2004) to be selected during focused coding, CGT is open to more than one significant or repetitive code which ultimately allowed for ongoing analysis of the meaning and adequacy of the data. Focused codes tend to capture clusters or groups of the initial codes, and this process was more "directed, selective, and conceptual" (Thornberg & Charmaz, 2011, p. 48) in advancing the analysis. Again, this was not a closed process but an emergent one; I remained active, coding and modifying the initial codes, and open to what the data revealed.

6.4.d   Constant Comparison

Constant comparison is a method of analysis (Charmaz, 2014) that occurs throughout the collection and analysis of data to confirm that the data support, and continue to support, the emerging categories (Holton, 2010). Constant comparison is part of each stage of analytic development, and "builds and substantiates emerging categories by defining properties and dimensions" (Holton, p. 27). The process of comparison is not linear but dynamic and ever-evolving and in this programme of study involved comparison of data to data, data to codes, codes to codes, codes to categories, categories to categories, categories to concept, and ultimately core categories and theory to extant theories. Constant comparison precludes collection of redundant data because it becomes clearly evident when categories become saturated (i.e. no new conceptual dimensions or properties emerge).

Throughout the process of coding and categorizing, constant comparative analysis took place with me actually shuttling back and forth, through and between, the initial codes, focused codes, wall notes, memos, and categories. The initial codes started out on one wall, focused codes on another, and hand-written notes and post-it notes began to link the codes. As further data was gathered and coded, connections between the codes was noted and larger post-it notes and memos were added to the walls; categories began to emerge and were

more easily tracked with colour-coded post-its and memos. As connections became evident, I attached string from one category to another; between the colour-coding and the strands, the theory, a 'web' of connections, emerged. At that point, communication with my supervisory committee was very helpful so that I did not become overwhelmed, distracted, or off-track as I 'lived in my head' and 'became one' with the data.

As noted by Charmaz (2014) and Holton (2010), core categories only emerge over time through iteration, memo'ing, and theoretical sampling; core categories occur frequently in the data, are central to the theory, relate to other categories, and form the 'bones' of the theory. Unlike other GT (see for example: Glaser, 2004), there is not a single core category of this theory; the inter-relationships between the six categories are what gives the theory its robustness (more will be said about this in chapter 8.11).

As the categories in this programme of study began to emerge, and with constant comparison between/among categories, conceptual categorization began; this is the process of generating and refining categories through the comparison of data, incidents, codes and other categories. Categories "explicate ideas, events, or processes...and may subsume common themes and patterns in several codes " (Charmaz, 2014, p. 189), helping to move the codes from simple descriptions to conceptual categories which then allowed them to be treated more theoretically, and led to theoretical sampling.

6.4.e   Theoretical Sampling

Theoretical sampling is defined by Charmaz (2006) as "seeking and collecting pertinent data to elaborate and refine categories" (p. 96); Thornberg and Charmaz (2011) note that theoretical sampling continues the interactive process and "evokes ideas, hunches, perspectives, and questions that will guide further data collection" (p. 60). This process of refinement, interactivity, and comparison was effective in helping me to feel less overwhelmed by the quantity of data and the analysis. Conversations and feedback from my supervisors also helped; the 'details' of the data receded somewhat as I focused on the categories and the relationships between them, and began to construct theory. Theoretical sampling is not "about representing a population or increasing the statistical generalizability" (Charmaz, 2014, p. 198) of the outcomes, which are common errors in defining and

developing theoretical sampling.

Theoretical sampling is a key CGT method that is "strategic, specific, and systematic" (Charmaz, 2014, p. 199) and helped me clarify and develop the categories and sub-categories; it provided direction for further data gathering in the form of questions to ask during follow-up interviews. Theoretical sampling compares emerging theory with extant theory yet goes beyond the literature review (Wuest, 2012) to ensure the construction of "full and robust categories" (Charmaz, 2014, p. 200); this process of comparing my categories and sub-categories to literature assisted me to see and explore the relationships between the categories thus building and rebuilding the theory.   More simply, theoretical sampling takes the data and constructs tentative proposals about it then exposes the existing and new data and the proposals to further analysis and inquiry; it is "conceptual development in order to generate a grounded theory" (Thornberg & Charmaz, 2011, p. 61) and challenged me to constantly think about the emerging theory at an increasingly abstract level.

Theoretical sampling involves 'abduction' (sometimes called *best guess* or *best shot*) a form of creative reasoning that combines the data and the incomplete theory and comes to a creative and useful explanation; I was able to make inferences as to how to account for surprising findings (Charmaz, 2014, p. 201) then went back to the data and re-examined them and/or added to them in the face of new theoretical frame. I was surprised at how effective this back-&-forth process was for increasing the depth and breadth of theory development; it did not seem possible that I would find new and deeper meanings until I actually engaged in the process of induction, moving pieces of paper around on the wall charts and 'mapping' categories and connections, and creating new visual representations of the emerging theory.

6.4.f   Theoretical Saturation

In CGT, data collection stops when theoretical saturation is reached. Bowen (2008) notes that saturation occurs as a result of theoretical sampling and there is less of a focus on sample size and more on sample adequacy – the *quality* of the theoretical sampling dictates when saturation happens rather than sample size. Morse and Niehaus (2009) suggest that

saturation occurs when redundancy (p. 64) is reached, and Dey (1999) suggests that "theoretical sufficiency" (p. 257) is a more appropriate and relevant concept for grounded theory studies. Regardless of terminology, saturation for me occurred when there was no more new data coming from the interviews and it seemed that the categories were comprehensive. Saturation occurs when "gathering fresh data no longer sparks new theoretical insights, nor reveals new properties of these core theoretical categories" (Charmaz, 2014, p. 213). Thornberg and Charmaz (2011, p. 61) offer some questions that helped me assess whether saturation had been reached, including: are there gaps in the categories; are definitions vague or underdeveloped; is data missing that could more fully conceptualize categories, relationships, or the grounded theory? In this case, I developed initial and focused codes on all eight interviews, then went back and worked through the first four transcripts elevating the codes to concepts to categories, and developed an understanding of the categories which then began to generate theory. I then took the final four transcripts and examined how those codes fit with the emerging framework of resilience. Finally I juxtaposed the codes from the 'pilot' interview, a firefighter completely unrelated to the FRS under study, alongside the developing theory hence providing a form of triangulation and verification of the categories. I felt that saturation had been reached after eight face-to-face interviews; I had thought of perhaps interviewing ten participants, but by eight interviews, I was hearing similar language and ideas. The asynchronous interviews elucidated similar terminology, ideas, and insights; it became clearer once I was looking at categories and sub-categories that I was finding no new properties or patterns.

I also exposed the focused codes to an outside perspective in the form of a 'critical friend' who first reviewed the codes and then looked at the categories/sub-categories, and was able to see the relationships and did not identify any gaps. My critical friend did raise some questions about the terminology I was using, and pointed out that some of my language did not seem reflective of the data (i.e. I initially named a category 'social support' but when re-looking at the data, firefighters were actually talking about 'relationships' and how those relate to social support). I was cautiously optimistic that my data supported the developing theory while also providing variety in the form of negative case analysis to help frame the categories.

6.4.g   Negative Case Analysis

Negative case analysis refers to looking for and at those data "that demonstrate sharp contrasts with the major pattern that accounts for most of the data [thereby] making its robustness problematic" (Charmaz, 2014, p. 198). In a positivist approach, a negative case would refute the theory. In CGT when a negative case presents itself, rather than looking for dire consequences, the 'case' is welcomed and the data is re-examined to look at why the case has occurred in the atypical way; frequently the multiple renderings and codes surface other perspectives that result in a more complex and richer theory.

I searched for negative cases in this study but what initially seemed to be outliers were ultimately shown to be 'less common' data but still relevant to the development of a robust theory. For example, one participant defined resilience in the context of economic productivity which seemed to be the antithesis of a definition of resilience in the volunteer FRS. Upon further examination and through the processes of coding, memo'ing, and comparison with others' perspectives, this idea of economic productivity became less of an outlier and simply became one more perspective on resilience; the idea of economic productivity is part and parcel of 'coping' with stressful events and, as a sub-category of personal resources, is supported in the literature.

6.4.h   Summary Of Analysis

Given the amount of information in the previous sections describing data analysis, I have included as Appendix VII a mind-map that shows examples of the messy inductive and deductive processes of data collection and analysis; this visual along with the questions I kept referring back to in the stages of initial and focused coding, combined with memo'ing helped to keep me from becoming lost in the amount of data. Analysis was ongoing with constant comparison occurring between interviews and the integration of new data from subsequent interviews; the results began to become more coherent through the use of wall charts and drawings that allowed the visualization and 'movement' of data. Categories began to emerge, and sub-category data also began to naturally 'fall into place'; the wall drawings had hundreds of post-it notes in various colours that were eventually colour-coded to match the categories. As the flow of data decreased, the amount of 'bits' of data increased, and the challenge was then how to manage the volume. The processes of

theorizing (putting data together in colour-coded categories) and comparing/contrasting with extant literature helped to validate the findings and also show that the existing theories of resilience lacked direct relevance to firefighters. The results validated previous knowledge about the calls that are most bothersome to firefighters, the common reactions that they have in response to stressful call, and the strategies that are implemented to cope with reactions to tough calls. Chapter 7 will address these aspects of the findings. The new theory that resulted will be discussed in Chapter 8.

6.5   CRITERIA TO EVALUATE THE STUDY

How studies are evaluated was also a consideration in the choice of methodology given that the questions relate to perceptions and experiences of firefighters. Typically the criteria for assessing the quality and robustness of quantitative studies are: validity (the appropriateness of the tools, sample, constant comparison, etc.); reliability (exact replicability), and generalizability (use of the same tools, settings/populations, constant comparison, etc.) (Leung, 2015). However these criteria are problematic on many levels; for example this study examines firefighters' experiences and perceptions using an interview guide that emerges from each interview; the interview questions may not be exactly the same within the population hence cannot be 'replicated'. As well, the population of volunteer firefighters (i.e. numbers, rank, culture) may differ from one FRS to another which, if using Leung's criteria renders the study non-generalizable and invalid.

Modifying Glaser & Strauss' criteria of fit, resonance, and utility (1967), Charmaz's criteria for evaluating constructivist grounded theory studies are: *credibility, originality, resonance* and *usefulness* (Charmaz, 2014, p. 337). *Credibility* means there are links between the data and the theoretical arguments, and that the study has an in-depth familiarity with the phenomenon. *Originality* requires that there are new insights and/or new conceptual renderings that have significance theoretically and socially. *Resonance* is when the theory accurately reflects a depth and breadth of the phenomenon that makes sense to participants as well as offering them deeper understanding about the phenomenon. *Usefulness* requires the theory to contribute to or to advance knowledge about the phenomenon. These are the criteria that were adopted for this research. Charmaz (2006) also notes that the principles

and practices of grounded theory encourage further systematic questioning and analysis, and the cyclical inquiry is foundational to grounded theory methodology. This study engaged with firefighters in its design, implementation, and interpretation of outcomes, thereby providing originality; credibility is found in the linking of the data generated by firefighters to the theory of resilience; it resonated with FRS and academia because it is topical and fills research gaps as well as reflected the language of FRS; and it is useful because it forms the scaffold for stress and resilience policy and practice within FRS.

6.6   CLINICAL GOVERNANCE

Ethical approval for the research was sought through Nottingham Trent University's College Research Ethics Committee (CREC). The ethics application process explicates protection of participants and their information through various processes such as: informed consent, confidentiality and retention of data, potential risks to participants and solutions for managing risks, etc.; full ethics approval was granted prior to commencement of data collection and is attached as Appendix II. Written consent was obtained from each participant prior to the first interview, and participants were reminded they may withdraw from the research at any time without prejudice; subsequent interviews reviewed these processes. Given the possibility of trigger effects of conversations about trauma, participants were also informed at the beginning of each interview (initial and follow-up) of the resources available if distress occurred post-interview. The FRS has a trained peer support program, and access to both an employee assistance program and the public system's mental health walk-in counselling clinic. The consent form is attached as Appendix III.

6.7   CHAPTER SUMMARY

This chapter provided in-depth discussion of study conduct including design, sample, participants, and study methods of data collection and analysis. The methodological alignment of the research questions contribute to the increased understanding of stressors, reactions, and coping in the FRS, and how firefighters define resilience which in turn build on contextualized data that underpin the theory. The criteria used to evaluate CGT research were described in order to situate the programme of study within a systematic process of

data collection, data analysis, and theory construction. The next chapter will present and discuss the study findings for the first four research questions: which events are considered to be PTEs, how do firefighters react to and cope with PTEs, and how do volunteer firefighters define resilience.

CHAPTER 7: PUTTING IT ALL TOGETHER – RESILIENCE THROUGH THE EYES OF FIREFIGHTERS

…my ideas of a firefighter was some guy in a red truck roaring down the road, kicking in someone's door, making a hell of a mess and going home [instead] I noticed without exception the dedicated individual striving to maintain a standard on a job that is under constant criticism, mostly from individuals who don't have a clue what this job entails.
Allan de la Plante (1993)

7.1   OVERVIEW

This chapter introduces the findings of the interviews and aligns those with research questions one through four. The chapter begins by describing the types of events that firefighters find most stressful, the stress reactions that they articulated, and some of the coping strategies that they utilize to deal with those reactions. Secondly, firefighter definitions of resilience are reviewed in order to situate the reader in the context of volunteer firefighters. The chapter concludes with a 'new' definition of resilience that integrates firefighter perspectives with existing definitions, providing a broader and deeper understanding of the construct.

7.1.a   Overview Of Research Findings

As outlined in Chapter 1 research questions were themed and addressed within sections: stress and coping, defining resilience, and construction of the theory (categories and relationships). The findings map to these questions and are presented in two chapters. The new theory of resilience that emerged from this programme of study will be presented in Chapter 8.

This chapter will discuss and synthesize data that unfolded from the context of firefighter stressors, coping mechanisms, and definitions of resilience; Table 3 provides an overview of the findings.

Table 3:   Research Questions 1.1 – 1.4 - Findings

RESEARCH QUESTION	FINDINGS
Question 1.1 What incidents are considered by firefighters to be PTE's	• Death of, or serious injury to, a child • Death of, or serious injury to, a fellow firefighter or member of the firefighter 'family' • Knowing the victim or having the victim resemble someone known to the firefighter • Gruesome or chaotic scenes (large scale incidents, carnage) • Bystanders, 'looky-loos' who interfere with incident management
Question 1.2 How do firefighters react to PTE's	• Physical – upset stomach, vomiting, increased heart rate, fatigue, • Emotional – sadness, anger, range of emotions, no emotions • Cognitive – difficulty concentrating, poor memory, rumination, preoccupation • Behavioural – restless, difficulty relaxing/sleeping, 'not myself' • Spiritual – questioning own faith/spiritual practices, questioning own 'fit' for the job, questioning own place in society/role in social justice
Question 1.3 How do firefighters 'cope' with their reactions to PTE's	• Physical – exercise, working out • Emotional – talking, verbal ventilation • Cognitive – self-awareness, stress management • Behavioural – focus on the job, take time to self following, critical incident stress defusing/debriefing, being with others, focusing on tasks • Spiritual – making meaning through community service/events, memorials; self-reflection
Question 1.4 How do volunteer firefighters define resilience in the context of the FRS?	Firefighter definitions combined with existing definitions in the literature create a new definition: **A system of alternative yet inter-related pathways through adversity; a multidimensional, multileveled, dynamic and transformative health construct underpinned by salutogenesis, and with biological, psychological, cognitive, behavioural, and spiritual/cultural influences**

7.2   POTENTIALLY TRAUMATIC EVENTS IN THE FIRE RESCUE SERVICE

7.2.a   The 'Tough Calls'

This section describes the calls that firefighters describe as the 'tough calls'. Each of the fire,

medical aid, and first responder calls that the firefighters are paged to are unique but the

majority of firefighters have had specific training for responding to specific types of incidents; anticipatory planning for what to expect and how to operationally respond begins as soon as the pager goes off. Even when the outcome of the event is not positive (i.e. the death of a victim), firefighters take solace in knowing that they executed a technically sound response to the event, and will look for positives within the event separate from the outcome (making meaning of the event).

The most challenging calls are those that involve children, particularly those that involve child fatalities. These calls seem to strike at the very heart of the volunteer FRS, challenging the values and beliefs of culture and society: protection of the 'innocents' of the community, provision of service to the community, and for many firefighters, the sense that 'those could be my kids'. No matter whether the child is lost to fire, motor vehicle or other incident such as sudden infant death syndrome (SIDS), the death of children engenders visceral reactions across multiple domains (physical, emotional, cognitive, behavioural, and spiritual), that often require special attention by the firefighter and the organization.

Death of, or injury to, firefighters or family members of firefighters are also very stressful for members of any FRS but many occur more frequently for volunteer firefighters since they serve in the communities in which they live. One firefighter noted the victim:

> turned out to be [a family member] of one of our members [and] who
> was very well-known in the community…it was tragic (Shawn)

The firefighter then went on to discuss the need to manage one's emotional responses in-the-moment. Volunteer firefighters very often know the victims of the incident to which they are responding. One firefighter described an incident:

> when we rolled up, I recognized [the victim] – it was [fellow firefighter's]
> mother…it was tough to put it aside and just do the job (Jamie)

Recognizing the victim as your neighbour/friend/family member creates an immediate emotional response that many volunteer firefighters work to suppress in the midst of the

emergency. However, another common occurrence is when the victim resembles someone the firefighter knows which again creates a visceral response that must be managed in-the-moment:

> *I thought it was my mother and I had to give my head a shake…I needed*
> *to go home after and give my mom a hug (Andy).*

Similarly, calls involving fatality or serious injury of people that are close in age or gender to the responders has been noted as a trigger and must be dealt with in order to complete mission:

> *I just felt so bad at the loss of a young life – someone close to me in age -*
> *it really affected me then and afterwards but I just got through it (Andy)*

> *It reminded me of how fragile life is – I just needed to put my head down*
> *and do the job (Sam)*

Suppressing emotions has been viewed as negative (Regher, Goldberg, & Hughes, 2002) but in reality serves the purpose of allowing firefighters to continue with the tasks of rescue/response without the distraction of emotional overload; ensuring there is an outlet for emotions following the event is key to healthy coping and resilience (see for example: Coifman et al., 2007; Haslam & Mallon, 2003; Jeannette & Scoboria, 2008).

Evidence shows that stress inoculation in the form of pre-incident education can be beneficial to emergency service personnel when they are faced with various stressors (Everly & Links, 2012); it seems logical to educate firefighters early in their careers such as during recruit training about the potential stressors that they may face. Knowing that victims may be known or resemble someone, having awareness of the potential for this stressor to create distress, and having the venue for discussing the impact of this phenomenon helps firefighters in small communities cope with those stress reactions.

Gruesome scenes and/or chaotic scenes are difficult for firefighters as are any incidents that

result in heightened sensory experiences (visual, auditory, tactile, olfactory, and gustatory). Several firefighters thought back to incidents and remembered years later:

> *[I still remember] the smell of the antifreeze and the oil and the transmission fluid and everything from the vehicles (Jamie)*

> *…the feel and the sound of the ribs cracking [when performing CPR]…the ribs always crack (Chris)*

These sensory experiences are noted to be distressing in the immediate aftermath but over time become part of the memory bank.

> *…the sight and taste of the blood and everything – I remember it and am reminded of it but it doesn't bother me now – and I know where they are coming from [the stress response] (Shawn)*

For this firefighter relating their reactions to the human stress response (which begins with input from one or more of the senses) allows reactions become understandable hence normalized; this supports the role of pre-incident education to allay distress and build resilience.

Bystanders that become involved in the emergency situation can become stressors if they interfere with evidence-based protocols or 'get in the way' of firefighters carrying out their tasks. An example of a problematic bystander was described by several firefighters but most succinctly by Shawn:

*When we arrived on-scene [of an MVI], someone…had 'taken over' the
scene, and without proper equipment attempted medical aid on a
critically injured victim. [They] initially refused to allow the first
responders to do their jobs, and when escorted away from the victim's
side, became belligerent, shouting at us, and criticising our
care…continued to scream and yell at us…hit one of the first
responders…jumped into the ambulance and needed to be forcibly
removed. This bothered me on a lot of levels for a long time – and it was
really hard to focus and do the job at the time (Shawn)*

Having bystanders interfere in unhelpful ways adds another layer of stress to the already
PTE. Other stressors include 'looky-loos' (lingerers, curiosity-seekers), bystanders or drive-
bys with swivel-heads who have no relationship to the event yet stop to gawk, shout advice,
or snap photos on cell phones:

…you can be on You Tube a minute after you're on the call (Chris)

These stressors are said to provide dangerous distraction in-the-moment to firefighters who
are providing necessary services such as traffic control; the looky-loos continue to create
distress for those who, involved and focused in-the-moment on rescue services, find
themselves the unwitting and unwilling stars of a You Tube video or media story following
the call.

7.2.b   Discussion Of Findings About 'Tough Calls'

The findings of what constitutes a tough call for volunteer firefighters is consistent across the
existing literature of high-risk professions as discussed in section 3.8. Although there are
only three studies that are explicit about stress in volunteer firefighters (Blaney & Brunsden,
2015; Bryant & Harvey, 1996; Johnson, 2010), all note that death/injury to children, death or
injury to firefighter/family members, knowing the victims, and gruesome scenes are most
distressing to volunteer firefighters. Current findings are also consistent with other
literature related to career and combined FRS (see for example: Beaton et al., 1998, 1989;
Blaney, 2003; Jeanette & Scorboria, 2008; Malek et al., 2010). Although they do not always

result in distress, these are the calls that should be highlighted as PTEs so that provision can be made to overtly address the potential distress upon return to the station after the call. Evidence shows that it is the individual's and the organization's perception of the event that makes it potentially traumatic (WHO, 2014) yet knowing which calls commonly are perceived to be 'tough' can allow for proactive strategies individually and organizationally (Noblet & LaMontagne, 2006). More will be said about this in the 'coping' section (7.4) but an example of pre-emptive action is an operational guideline for activating post-incident services such as the CISM team that are automatically called upon as soon as it is evident that the event is one of the 'tough' ones.

Currently, there is little literature available on the effects of social and other forms of intrusive media on the psyches of firefighters. Although there is some work being done on harnessing social media as an aid to disaster response (Hashimoto & Ohama, 2014), there is little written about the negative effects of social commentary and 'sound bites' except in the broader context of mental health (see for example: Centre for Addictions and Mental Health, 2015). This is an area for continuing research.

7.2.c   Summary Of 'Tough Calls'

This section of the thesis answered the research question 1.1: 'what incidents are considered by firefighters to be potentially traumatic?' The findings are relevant as a reminder and reinforcement of previous literature about the importance of recognizing that although all calls are PTEs, there are several that 'tug at the souls' of firefighters. Pre-emptive strategies such as pre-incident education about work-place stressors from the recruit level onward are critical to firefighters regaining their equilibrium quickly post-incident.

7.3   REACTIONS TO POTENTIALLY TRAUMATIC EVENTS

7.3.a   Reactions To Tough Calls – "It's Okay Not To Be Okay"

The volunteer firefighters in this study recognize the normal and expected reactions to the stress engendered by calls, and are able and willing to identify those reactions. Firefighters acknowledge a wide array of reactions, and several used the phrase 'it's okay not to be okay' (see extracts below in this section) subsequent to tough calls. Firefighters note that stress reactions sometimes seem overwhelming and certainly are distressing yet having the

knowledge of the aetiology and common timelines to resolution as well as a 'toolbox' of coping strategies prevents them from becoming overwhelmed or thinking they are "going crazy" (Chris) or "losing it" (Sam). As well, the culture of openness in TBFRS and the examples set by senior members of the FRS support the need for ongoing discussion about reactions and coping.

Reported reactions to tough calls fall into five domains: physical, emotional, cognitive, spiritual, and behavioural. Physically, firefighters reported:

I vomited (Frankie)

I was so very very tired for a bunch of days afterward (Shawn)

My stomach gets upset, I have to pay attention to making sure I eat properly…sometimes can't go back to sleep [after a mid-night call] and I get to thinking about the call…sometimes it seems like I'm thinking about it all the time for days on end – but I know I'm not, I'm just reacting to triggers [news reports]…these are just cues that I need to pay attention to…talk to [spouse] or the crew, get outdoors…(Andy)

These physical reactions are directly related to the biochemical processes that are part of the human stress response discussed in section 2.8.a. Overt physical reactions can be disconcerting to firefighters but are adaptive rather than pathological providing cues that the firefighter must be intentional about managing and/or effectively mitigating those reactions.

Firefighters experience a range of emotional reactions to PTEs:

[I] felt really really sad (Jamie)

I felt a whole bunch of feelings immediately, and for some days afterwards – grief, sadness, anger, tears, and sometimes just nothing…a whole range (Shawn)

[I] got angry (at social injustices and poverty that added to the risks by
having no smoke detectors)…it wouldn't have happened if it was your
neighbourhood, or my neighbourhood, or anywhere other than this
[economically disadvantaged] neighbourhood (Max)

These examples of emotional reactions demonstrate the range of emotions (from overwhelming emotional impact to emotional numbing) that are part of the human stress response and are triggered by interactions with human suffering. Again, these can be seen as cues for actions or strategies to aid in mitigating these common and expected outcomes.

Cognitively, firefighters are often surprised to find that they have difficulty with simple tasks post-incident:

I just had a really hard time concentrating – it always helps to go back to
the hall and clean up, roll hose… (Chris)

I'm preoccupied with it for a few days, occasionally for a couple of
weeks…I just go into myself (Sam)

These cognitive changes are not reported to occur during the incident, but manifest themselves after-the-fact when firefighters are attempting to relax, sleep, return to work or routines, and again can be disconcerting if they are unexpected.

Firefighters say that although they don't always recognize it, their loved ones report behavioural changes that occur subsequent to a tough call:

I get really restless [after a bad call] (Andy)

[Spouse] always knows – I guess I'm kinda withdrawn, 'remote' for a bit;
it takes a bit of time to shake it off and get back into things (Jamie)

However, Chris recognizes the cues and takes time-out away from friends/family:

I get jumpy and I just need to take some time to settle down (Chris)

There are a wide array of behavioural manifestations reported by firefighters that out of context may be viewed as unhealthy (i.e. restlessness, withdrawal, preoccupation) but when viewed through an adaptive health lens, the human stress responses are seen as normal and expected. These behaviours however speak to the need for routines such as cleaning the truck, rolling hose, and other activities that can help transition from the intensity of the call to the more mundane aspects of life post-incident. As well, pre-incident education for firefighters and families about the behavioural manifestations of stress has been noted to be beneficial in decreasing distress and behavioural changes (see for example: Jeannette & Scorboria, 2009).

Some of the most profound and moving examples of reactions to tough calls are those that I refer to as 'spiritual' reactions; they touch the souls of firefighters rather the physical or emotional self, yet are still 'normal and expected' aspects of the human stress response. These reactions run the gamut from sadness, grief, questioning one's value as a firefighter, questioning one's 'fit' with the job, etc.

It was traumatic from the get-go. You roll up, open the doors and there's screaming and wailing [of witnesses, relatives, bystanders] – it was very hard for everybody and it takes effort to stay focused and do the job (Max)

Sometimes there's just nothing you can do – it's out of your hands and you just have to accept that you're not getting a good outcome today so you look for other things that do go well to help you through the ones that don't (Jamie)

There are times when I question whether I'm cut out for this...if I'm doing

any good...but then I talk to the crew and someone always has a

perspective that reminds me of the importance of our work (Andy)

You're with people at the most tragic time of their lives...it's hard, it's

profound (Shawn)

It's okay not to be okay...you can't help but be affected by the work we

do (Chris)

Many of these reactions relate to intrapersonal aspects of human nature such as values, beliefs, worldviews, etc. that are challenged by the incidents and/or outcomes. Other commonalities of these extracts is the thoughtfulness and sensitivity of the firefighters; despite being faced with traumatic and at times horrifying incidents, they maintain their humanity; they find solace in each other, in technically sound operations, and in providing service to people during times of crisis and high emotion.

7.3.b Discussion Of Firefighter 'Reactions' To Tough Calls

Much of the literature frames firefighters' reactions to tough calls as negative and as precursors to illnesses such 'post-traumatic stress disorder' (see for example: Beaton et al., 1998; Haslam & Mallon, 2003). In contrast, however, when stress reactions are viewed from a 'health' lens, the firefighters' responses are confirmed to be 'normal and expected' (Blaney & Brunsden, 2015) and adaptive (Ellis, 2015); the majority of firefighters experience varying levels of distress across physical, emotional, cognitive, behavioural, and spiritual domains. These reactions are in keeping with the understanding that stressors create a variety of stress responses, and that generally firefighters adapt to the stressor and manage their stress reactions utilizing a 'menu' of stress management strategies. Stress reactions become problematic when they do not 'settle' within a reasonable timeframe (i.e. 7-10 days), when they overwhelm one's ability to cope, and/or otherwise impair function across multiple domains of the individual's life (see for example: Biron et al., 2012; Hobfoll et al., 2015; Miller-Karas, 2015). Firefighters in this study do not view themselves as impaired or ill; this cognitive schemata is consistent across the literature (Jeannette & Scorboria, 2008). In

contrast, Robinson-Kitt (2009) noted that there is a lack of awareness on the part of firefighters about the impact of PTEs unless and until there is significant distress. This was not a finding within the TBFRS – there is an awareness of the possible negative outcomes of stress but a culture of openness to discussing distress and options for managing stress reactions sooner rather than later. Further situating the reactions of firefighters within a health context, Selye (1980) described the negotiation of stress and stressors as a consistent pattern of mind and body actions and interactions; it is the interactive nature of the stress response that places it within a salutogenic framework and this interaction is evident in the TBFRS.

7.3.c   Summary Of Reactions To Tough Calls

This section of the thesis explored how firefighters react to PTEs, and finds there is a wide array of reactions that are 'normal and expected' and in keeping with literature on the human stress response (see for example: this thesis section 2.8.a; Everly & Links, 2012). It was evident in the interviews that the firefighters were comfortable talking about their reactions; they do not view or experience those reactions as abnormal or particularly troubling. They were also clear that having received education about potential reactions and resources helps in the aftermath of tough calls in normalizing reactions and cueing coping. Many firefighters noted that prior to the CISM program's education components becoming "part of the culture" (Frankie) of the FRS, they frequently forgot and/or became overwhelmed with their reactions; the ongoing education about stress and coping by peers within the FRS serve as normalizing reminders that there is a physiological cause for their reactions and that each firefighter has proven resources to use to mitigate the reactions. TBFRS attribute much of their equanimity to resilience – recognizing that, rather than the old adage of 'suck it up buttercup' and denying being affected by the work they do, firefighters acknowledge that providing emergency service can result in very human reactions that are normal, expected, and can be mitigated. An important piece of these findings is to ensure that the CISM program serves not only the purpose of verbal ventilation but also provide opportunity to explore some of the intrapersonal and at times existential questions related to life, death, and emergency service, which further assists with meaning-making.

Firefighter perspectives of the reactions to tough calls advances the overall understanding of

reactions as broad, common, and expected, informing research question 1.2: 'how do firefighters react to PTEs?' These findings are congruent with the adaptive nature of the human stress response (Ellis & del Giudice, 2014; Everly & Links, 2012), and the assumptions of this programme of study described in section 3.6: stress reactions are wide, varied, common, and expected and having knowledge about these reactions is a contributor to resilience. The recognition of the benefits of stress education requires a shift in thinking towards adaptive responses to stress and reinforces calls for proactive intentional health promotion in the FRS.

7.4.   COPING WITH REACTIONS TO POTENTIALLY TRAUMATIC EVENTS

7.4.a   Dealing With Reactions - Coping

As discussed in Chapter 2.6, coping and resilience are terms that have been used interchangeably in some literature (see for example: Richardson, 2002). In this thesis however coping emerged as a subcategory of *personal resources* which, in turn, emerged as a core category of resilience (see sections 8.3.a-c). For the purpose of research question 1.3, c*oping* is defined as the behavioural and cognitive efforts or actions undertaken to endure, decrease, or overcome the demands created by a stressor. Overall, findings from research question 1.3 asking specifically about coping illuminated a series of actions undertaken by firefighters in one or more domains (physical, emotional, cognitive, behavioural, and spiritual); subsequently this programme of study found these actions are reliant upon the availability, accessibility, and utilization of resources which will be further explored in sections 8.3.a-c.

Coping can be viewed as the action of adapting to stressors and the term is used interchangeably with 'dealing with', 'managing' in relation to stress reactions in this thesis. TBFRS firefighters spoke to this question in great detail throughout the interviews, and the relevant data extracts overlap with the category of 'personal resources' section (sections 8.4.a-c). The extracts that address 'actions' are presented here and the resources required to for those actions are discussed in section 8.3.a-c – personal resources. Also in this section are examples of coping with specific situations, some of which are unique to volunteer firefighters (reacting to the pager), as well as the need to verbally ventilate their reactions with crew and/or spouse.

Physically, firefighters talked about exercise, or working out, as key to dealing with stress reactions:

> It really makes sense to me to, if we have a stressful call with lots of
> adrenaline and all that other stuff, to go clear it out of my system – a
> walk, a walk and talk with a friend, anything outdoors – clearing my
> head while clearing my body (Shawn)

> A good physical workout – the bike (Bobbie)

> Getting out in nature and getting my heart rate up, clearing those stress
> chemicals (Shawn)

Exercise has been linked to coping (see for example: Childs & deWit, 2014; Cripps, 2008) and is a strategy that is highly valued by TBFRS firefighters as seen by these various methods for physically managing stress reactions. It is also a strategy that forms a key part of the CISM interventions in the form of questions about how firefighters take care of themselves and strategies for incorporating exercise as a way to ventilate stress chemicals.

Many firefighters talked about consciously managing their stress reactions when the pager goes off in order to safely and efficiently make their way to the station, and from there to the incident. Carrying the pager and getting used to the unpredictability of being paged is a stressor that is not shared by other emergency responders, yet volunteer firefighters are not formally trained to deal with the unpredictability or the sudden surge of stress chemicals when the pager goes off. Coping strategies are shared amongst each other and become part of the 'culture' of volunteer fire service:

> I had to learn to calm myself down when the pager went off…now have
> a routine of calmly getting out of bed, getting dressed, driving the speed
> limit even with siren and lights, thinking about the call, planning out
> what we will do – just take the opportunity to calmly think through
> what's possibly to come (Andy)

I thought I was the only one who fell down while stumbling around trying

to find my clothes in the middle of the night…one of the senior guys

asked and I admitted it…he gave me some ideas for preparing in

advance for those mid-night calls (Sam)

This process of self-soothing and mental preparation was mentioned by most of the firefighters, regardless of their length of service. They all recalled how 'jumped up' they were when they were first given a pager, and how they obsessively watched/listened for it, and how it governed many of their lives for the first few months/years of service. Then the pager became:

just another piece of equipment that I carry; if I'm sleeping when it goes

off, I listen to see what type of call it is and if it applies to me, then I get

up slowly, walk (don't run) to the bathroom, get dressed, get in the

truck, and come to the hall – it's not a big deal anymore. But I still get

charged up when the pager goes – I just manage it better☺(Bobbie)

Self-soothing and self-management of stress reactions following a call were common to firefighters in this study but also in preparation to respond to calls and in the midst of incidents. This pre-incident preparation is in keeping with the notion that experience, or 'knowledge', and other personal resources contribute to resilience (see for example: Almedom et al., 2010; Pietrantoni & Prati, 2008); knowledge will be further discussed as a category of resilience in Chapter 8.7

Emotionally, during an incident, firefighters cope with their reactions by:

Bury…put the emotional element to the side and become pragmatic…you

work the emotional stuff after…your body's responding…you just have to

deal with it later (Max)

There are differing perspectives in the literature about emotional repression in emergency

providers. Regehr et al. (2002) in their work with paramedics suggest that emotional distancing may have negative long-term consequences on relationships. In contrast, Bonanno et al. (2011) and Coifman et al. (2007) find that in-the-moment emotional avoidance is a protective asset and an example of flexible coping. The ability to emotionally distance from the incident is seen as a strength by TBFRS firefighters during the incident but active steps are taken to re-engage with people (crew, spouses) post-incident through CISM processes and/or through talking with a spouse.

> *[Spouse] is my sounding board. I basically talk about everything from operations of how things were dealt with…to how it's bothered me. Keeping communication open with [spouse]...it's good to talk about things (Chris)*

Every participant who is currently in an intimate relationship cited 'talking' to their spouse as the second most frequent coping strategy that ranks very closely to talking to colleagues. Firefighters note:

> *My [spouse] is a support too…I talk to [spouse] (Jamie)*

The conversation with domestic partners is spontaneous but occurs one-on-one in the absence of children or other family members, and is focused on reactions and coping as opposed to the details of the call:

> *Bouncing things off [spouse] just talking about what happened, how I'm feeling, and what I/we can do to get through it (Shawn)*

> *We don't have to drag it out of each other…that discussion happens…and other members of the department, same thing [we talk about it] (Sam)*

These are significant findings given the potential stress/strain on family members and relationships, and speaks to the need to ensure family education and other resources are

provided for families of volunteer firefighters.

However, talking to, or verbal ventilation with, the crew and/or other firefighters was cited as the most common process for coping post-incident:

> *I don't think I understand how something's affecting me until I've articulated it afterwards and I can see or visualize how it fits…what is really tugging at my heart strings (Sam)*

> *Talking to other people in the department…talk to another senior officer (Chris)*

This finding of the need for and benefit of talking to one another as well as more formal stress debriefing is congruent with literature across the emergency services (see for example: Hill, 2014; McMahon, 2010; Regehr et al., 2005). The opportunity for verbal ventilation is cited in the literature (see for example: Blaney & Brunsden, 2015) as the most helpful resource after a tough call and peer support is most commonly named as the preferred resource (Jeannette & Scorboria, 2008).

There are some cognitive strategies that are endorsed by firefighters:

> *Writing – I love writing [it's] a bit of a stress-reliever…helps me deal and cope (Jamie)*

> *I actually don't mind filling in forms…it can be helpful in reviewing…getting things straight in my mind…recognizing this was, technically, a really good call (Frankie)*

Behaviourally, firefighters offered that focusing on the job, taking time for themselves, and participating in critical incident stress defusing are useful coping strategies:

Getting back into a routine as quickly as possible – taking kids to

activities, going back to work, CISM – just getting my head back into it

[life] (Chris)

I need to go away and think things through…not to get away from

people, but just take a bit of time for myself…I appreciate when I get the

chance to do that then go into a debriefing or such…I can be more

helpful to myself and the crew (Bobbie)

Making meaning through community service including attending funerals or memorials were commonly expressed actions for regaining one's sense of internal balance; taking opportunities for self-reflection individually or collectively during CISM processes also help allay questions of 'fit' for the job.

A bunch of us went to the funeral; we weren't asked to by the

department, but…this is our community and its loss is our loss so I went

to show respect but came away with a sense of closure – at least closure

on this call (Sam)

Other coping strategies include 'being there' for each other:

Calls that touch others' souls may not touch mine this time so I can be

there for those who are affected as they will be there for me when I am

touched by incidents (Andy)

7.4.b   Discussion Of Findings About 'Coping' With Reactions

Various coping mechanisms are used to deal with the reactions to PTEs including exercise (more will be said about exercise in sections 8.3.a-c), emotional expression, personal insight, and meaning-making.

Emotional expression as an interpersonal strategy post-incident is important to firefighters but emotional expression must happen in a safe supportive environment; as noted, these

conversations can be informal check-ins with one another or a more formal stress debriefing. Other strategies are intrapersonal and include taking some quiet time, writing, and recognizing how common and expected reactions are; as well, the value of experience (life and firefighting experience) was noted. More will be said about emotional expression when discussing 'personal resources' in sections 8.3.a-c.

Recognizing that *it's okay not to be okay*, an expression used by several firefighters (Shawn, Sam, Chris, Andy) is an important start to implementing healthy coping strategies (Carver, 1997); distress or not being okay are cues for activation of mechanisms from the coping toolbox. Conversely recognizing that a particular incident may not create stress and that 'not reacting' is normal and expected and does not mean one is 'hardened' (see for example Mitchell, 1983). These findings support the situation of 'coping' within a positive psychology framework that views, promotes, and values proactive and reactive flexible coping (see for example: Bonanno et al. 2011; Idan et al. 2010; McMahon, 2010; Seligman et al. 2013).

Stress, coping, and resilience awareness in TBFRS generally begins with a tentatively worded expectation made by the CISM peer support team that firefighters will be affected by some calls; pre-emptive education is provided as a matter-of-course: normal and expected reactions; healthy coping options; and external resources for services in the event that reactions remain distressing and/or begin to impair function in/out of the FRS. Firefighters are not silenced in discussing stressors and stress reactions as Robinson-Kitt (2009) found; the culture of the TBFRS supports informal discussions on the tailgate of the apparatus after the call, as well as more formal CISM services (defusings or debriefings), and, when needed, the facilitation of access to external resources such as mental health professionals. If distress seems to be developing a more clinical presentation, firefighters will supportively confront one another to converse about reactions and healthy management strategies.

The overall commonality of the findings about how firefighters cope with stress reactions was the health-focus and the readiness of firefighters to share their resources with one another and with this study. TBFRS firefighters articulated their use of a variety of adaptive coping strategies that are in keeping with literature (see for example: Bonanno, 2009; Carver, 1997; Jeannette & Scorboria, 2008; Luthans & Youssef, 2007; Regehr, 2009). The

findings align with the literature on contributory factors to resilience in other contexts such as children as discussed in sections 3.5.b, 3.7, and 3.9. These strategies are generally conscious attempts by firefighters to manage their reactions to PTEs, and are situated in five domains: physical, emotional, cognitive, behavioural, and spiritual. Physical strategies include: verbal ventilation, exercise, and humour. Emotionally, firefighters note that laughing, crying, and being angry and/or sad, and that simply 'going with' the emotional reactions is preferred to repressing their reactions; there are boundaries to emotional expression (such as in the midst of a call) but there is a recognition that being short-tempered and other emotions are normal and expected. This does not give firefighters a license to be rude or abusive to others, but knowing what their common reactions are and how those make them think/feel/act allows firefighters to negotiate the management of these reactions in advance of experiencing them (i.e. informing the crew that they will be silent/withdrawn immediately after a call and that they need space or support). Cognitively, TBFRS firefighters recognize that their capacity for concentration, memory, and abstract thought may be impaired, or that they will feel as if their brain is working 'a mile a minute'. The ways they cope with cognitive reactions are to rely on routines, checklists, or one another to 'check-in' to ensure they are not forgetting critical tasks; alternatively they inform family members that they may need reminders about specific events/responsibilities for a day or two following a critical incident. Behaviourally, firefighters do not necessarily recognize changes in themselves but do see changes in one another; families also provide feedback about behavioural changes.

Firefighters discussed how they cope with incidents that challenge their values, beliefs, and capacity for sense-making; this questioning of self, life, social justice, etc., although seemingly unusual, is within the context of common and expected reactions to stress as discussed in Chapter 2.8.a. Calls such as deaths of children and other needless deaths/injuries such as those resulting from drink/drive accidents may call into question the firefighter's values, beliefs, and life-meanings and may be trigger mechanisms for self-reflection, questioning, meaning-making, and other coping strategies. Firefighters in this research do not name tough calls as traumatic even when they cause spiritual reactions; as noted however the 'tough calls' require proactive and reactive strategies to ensure that firefighters have opportunities to process the call and their reactions including the

challenges to values and beliefs. Taking time for oneself, seeking a spiritual advisor, 'getting out in nature' and/or verbal ventilation in the form of stress defusings with their colleagues are endorsed as helpful in coming to terms with the events that affect the 'spiritual' self.

These reactions are not unique to firefighters but unless the adaptive manifestations of the human stress response are known and understood, people overall feel disconcerted and often distressed by their reactions; simply knowing what is going on their body and brain in response to stressors has been noted to be helpful to TBFRS members. Once again, recognizing the normal and expected behavioural changes that may occur allows firefighters to negotiate the management of those in advance with colleagues and families. As noted previously, it is imperative that family resilience be supported through education and other initiatives that allow families to better understand and respond to the stress reactions of their loved ones.

Firefighters in this programme of research did not endorse less-than-healthy strategies such as excessive alcohol use which has been cited as problematic in firefighters (see for example: Beaton et al., 1999); however, these findings are inconsistent across the literature with many researchers unable to find alcohol as a common or chosen coping strategy (see for example: Blaney & Brunsden, 2015; Hawkins, Durkin, & Hawkins, 2012). There are a number of factors that may contribute to this apparent change in coping over the years: in Canada and the UK, the availability of alcohol on-station has given way to fitness equipment/gyms; there is much less social tolerance for drink and drive behaviour hence 'having a pint' after a call has become less common since volunteer firefighters have to drive home or back to work immediately after a call; the culture of the volunteer FRS is more inclined to 'healthy' outlets for stress either through internal or external methods such as yoga, exercise, humour, etc. as has been found in this study.

Not only did this study find that coping is reactive with firefighters, it is also closed related to the availability, accessibility, and utilization of personal resources and is strategically proactive in a number of contexts: the culture of the FRS supports talking about stress and stress management before tough calls; the CISM team offers routine 'stress talks', short education sessions focused on common and expected stress reactions and open discussion

about coping; stress awareness begins at the recruit level with CISM an integrated component of recruit training. Angelo and Chambel (2014) find proactive coping mediates burnout and increases work engagement and motivation. These findings are supported by TBFRS firefighters who note the interactions between aspects of personal coping such as overall lifestyle factors contribute to resilience. These findings further inform the literature discussed in sections 3.7, 3.8, and 3.9 around factors that contribute to resilience: social support, personal coping, meaning-making, culture, and education; once again, the need for stress education for firefighters and families is foundational to resilience.

7.4.c   Summary Of Coping With Reactions

Insight into how firefighters cope with stress reactions (research question 1.3) was provided by the data as firefighters offered physical, emotional, cognitive, behavioural, and spiritual strategies that are commonly utilized before and after tough calls. All of these coping strategies are supported in the literature as adaptive and healthy (see for example: Ellis & del Giudice, 2014). As well, in this study coping is relative to personal resources which are proactive and not strictly reactive, showing the temporality of coping and linking it further to resilience (see for example Bonanno et al., 2015). Proactive coping is a stance that contributes to resilience (Fredrickson, 2001) as noted in the literature on positive psychology (this will be further discussed in sections 8.4.a-c and section 9.5.b). The findings of healthy adaptive coping also link to conservation of resources (COR) (Hobfoll, 2014); coping is the activation of resources and not an entity in-and-of-itself – it is the resources and their use that are key to resilience.

Having articulated what constitutes tough calls for firefighters, their reactions to these calls, and the resources they employ to cope with their reactions, the next foundational step to constructing resilience was to examine the data on firefighter definitions of resilience.

7.5   FIREFIGHTER DEFINITIONS OF RESILIENCE

7.5.a   What It Means To Be Resilient

It is important to understand how firefighters define resilience given the myriad of definitions in many contexts but the dearth of definitions of resilience in volunteer firefighters. As well, there are calls to compare and contrast definitions across multiple

contexts in order to look for, rather than assume, commonalities (see for example: Southwick, Bonanno, et al., 2014). The volunteer FRS provides a unique culture and context from which to increase the depth and breadth of understanding the resilience construct, and hearing how firefighters define resilience is foundational to building understanding.

In keeping with many other definitions from across disciplines and populations (see for example: Bonanno et al., 2015; Panter-Brick, 2014; Ungar, 2011), volunteer firefighters' definitions of resilience comprise two sections: adverse or potentially traumatic events, followed by 'bounce back' or return to the previous level of functioning:

> *[Resilience is] if I can get back to…ground zero and I'm at a point where*
> *it's not going to affect my judgement or my performance (Sam)*

This comment reflects the 'bounce back' component to resilience – adversity happens but resilience offers the firefighter a boomerang effect rather than a shattering effect. As well, firefighters define resilience as:

> *Minimal disruption to my life… ability to keep going or function in*
> *life…short and long term emotional functioning [and] there's a strong*
> *social component to resiliency…social connectedness (Max)*

> *To go through unpleasant circumstances and come out the other side*
> *without being overly affected (Chris)*

> *Wavering…but not crashing and burning…just feeling lousy for a period*
> *of time then coming back to myself, manage my fatigue (Shawn)*

> *It's getting through all the reactions, getting over what's happened – the*
> *incident and your reactions to it, and coming out – usually different but*
> *still essentially the same person (Jamie)*

The themes of 'getting through', minimal disruption and quick return to function is

congruent with other definitions of resilience articulated by, for example, Masten (2014) as the "capacity of a dynamic system to adapt successfully to disturbances…" (p. 6), and the recognition that people face adversity and may bend, but ultimately return to themselves. Bonanno's trajectories of resilience (2005) are reflected by comments about 'wavering' and 'minimal disruption' with swift return to pre-incident functioning. Firefighters do not deny distress but recognize its transient nature post-incident and its stable trajectory over time.

Themes of multiplicity of reactions and resources to accommodate or integrate those reactions were evident in firefighter definitions:

> *[Resilience is] just a whole bunch of things that come together to get you through some really nasty events…a series of coping mechanisms that you bring into play, people to talk to, a great culture, and just having the time and space to really think through this awful event (Andy)*

> *[Resilience is] being able to call on those things that help you on the path forward – exercise, reflection…(Shawn)*

These definitions begin to capture the multidimensionality of the resilience construct – multiple pathways and factors interact to build and maintain resilience – and reflects the growing recognition that this multidimensionality may vary across contexts. Overall, the process of 'getting over' is aided by dynamic resources and interactions, and may be transformative.

One firefighter questioned why people/society care about resilience, and hypothesized that current interest is related to the inability to generate income if we are not resilient:

> *If people are not resilient it affects their ability to work…our social value is based on…our economic value…it [resilience] is a value-laden term (Max).*

This definition aligns with the social and cultural definitions of Masten (2014), Panter-Brick

(2014) and Ungar (2008), and further moves our understanding of resilience beyond simplistic renditions. This social perspective also recognizes that resilience is more than coping; it is a temporal contextual health concept as found in the literature (see for example: Almedom & Glandon, 2007; Bonanno, 2005; Mancini & Bonanno, 2009).

In summary, TBFRS firefighters variously described resilience as 'bounce back', and/or returning to a sense of pre-incident/pre-stress functioning as in 'getting back to ground zero'. They did not endorse resilience as a lack of reaction to PTEs; instead firefighters see stress reactions within a context of 'normal and expected' and resilience as the process or trajectory that leads to a "semblance of normalcy" (Bonanno & Mancini, 2012, p. 10) after a period of disruption or distress. These definitions represent the perspectives of much of the literature (section 3.3 this thesis). The social perspective of firefighter definitions also recognizes that resilience is more than coping; it is a temporal contextual concept and any attempts to reduce resilience to a simple single-dimensional entity are not accurate reflections of this complex construct. This, in turn, leads to the tensions in both the firefighter definitions and the literature: the reductionist and disconnected approaches to understanding relationships between resilience components; these tensions result from attempts to simplify the concept at the expense of depth, breadth, and context of conceptualizing the construct. These subtle misunderstandings lead to increasing differences across contexts as resilience research is generally discipline-specific hence have contrasting epistemological and ontological foundations which may further narrow the understanding of resilience.

7.5.b   Integration Of Firefighter Definitions Of Resilience

Within the literature resilience is defined variously as: reintegration (Richardson, 2002); a dynamic adaptive system of 'ordinary magic' (Masten (2014); a core concept of emotional strength (Wagnild, 2009); a tool for health (Antonovsky, 1996) and salutogenesis (Almedom, 2005); a social construct (Ungar, 2008); and an umbrella concept overarching multiple integrated contexts, timelines, and trajectories (Bonanno, Romero, & Klein, 2015). Firefighters incorporate themes and aspects of all of these definitions into their iteration of resilience: the active utilization of multiple inter-related resources to manage reactions in multiple domains at multiple stages of moving through (dynamism) the process of bouncing

back. They incorporate knowledge of the domains of stress reactions and the resources necessary to aid the process of bouncing back, including a recognition that at times the trajectory of resilience may be transformational. Capturing the complexity and nuances of a definition of resilience in volunteer firefighters requires a 'systems' approach and contrasts with the tendency towards reductionism that pervades the literature.

7.5.c   A New Definition Of Resilience

A systems view reflects the complexity of the concept of resilience, noting that rather than one or two components and processes, resilience is a complex structure of inter-related and multi-dimensional components; resilience is dynamic with multiple pathways to and within resilience (resilience and complex systems will be further discussed in Chapter 9 – *Resilience as a complex adaptive system*). The conceptualizations of resilience provided by firefighters integrated with those in the literature culminates in a broad and inclusive definition of resilience in the volunteer FRS:

> *A system of alternative yet inter-related pathways through adversity; a multidimensional, multileveled, dynamic and transformative health construct underpinned by salutogenesis, and with biological, psychological, cognitive, behavioural, and spiritual/cultural influences.*

Additionally, firefighters' definitions of resilience, as articulated by Sam and Andy for example, situate the construct within the domain of health in contrast to traditional understandings of resilience as simply a disease mediator. Situating resilience within a health/salutogenic framework offers depth and breadth to the construct through its alignment with a *sense of coherence* (Antonovsky, 1998) which means making sense of the world through comprehensibility, manageability, and meaningfulness. More will be said about this relationship in Chapter 9 in the section subtitled *Resilience theory and salutogenesis*.

As well, firefighters' definitions of resilience (see for example excerpts from Chris and Max) also inform the field of positive psychology, defining resilience using positive, health-focused language and descriptors. This alignment with positive psychology language and concepts

will be discussed in the section on *Resilience and positive psychology* in Chapter 9.

7.6   CHAPTER SUMMARY

This chapter provides analysis and synthesis of firefighter perspectives to the research questions 1.1-1.3: exploring 'tough calls, multi-domain reactions to PTEs, and coping processes that occur in order to deal with tough calls. Understanding which calls have the most potential to cause distress for firefighters allows for proactive policy, planning, and education. Reactions fall into five domains (physical, emotional, cognitive, behavioural, and spiritual) and firefighters may experience all or none of these common, expected, and adaptive reactions. As a result, 'coping', the actions associated with bringing forth resources to manage reactions, is also framed within five domains, and, as articulated by firefighters, is health-oriented and, in many cases, proactive. These outcomes also contribute to the evidence recognizing education/awareness as resources for coping, and align with the literature about the value of information in allaying stress and enhancing coping as discussed in sections 3.5.b and 3.7. As well, this chapter, in addressing research question 1.4, provided a new definition of volunteer firefighter resilience noting resilience is influenced by individual, cultural, psychological, cognitive and biological components that are mediated and dependent upon one another. This perspective aligns with the conceptualization of resilience as a "stable trajectory of healthy functioning" (Bonanno, 2012, p. 755) following adversity; this seemingly simple sentiment is one that is imbued with the complexity that is reflected in the conceptualization of resilience in volunteer firefighters. The following chapter will address research questions 1.5 and 1.6 and will unpack resilience, exploring six core categories and related sub-categories, as well as the inter-relationships between the categories, ultimately providing a novel theory of resilience in volunteer firefighters.

CHAPTER 8: CONSTRUCTION OF A GROUNDED THEORY OF RESILIENCE

8.1   CHAPTER OVERVIEW

The previous chapter described the findings in relation to PTEs, firefighter reactions to PTEs, and health-oriented coping, all of which contributes to a new definition of resilience in the volunteer FRS. Building on the new definition articulated in section 7.5.c, this chapter will unpack the *concept* of resilience which was originally defined in section 2.2. of this thesis as an abstract idea that is used to summarize and connect multiple ideas such as facts and, in this case, includes the definition of resilience. The chapter will describe the core categories and sub-categories that emerged from the data, and will discuss the relationships between the categories and sub-categories. The chapter will conclude with an explication of the constructed grounded theory of resilience in volunteer firefighters, synthesizing the definition, categories, sub-categories and relationships. Table 4 provides an overview of the findings about core concepts and relationships that underpin the new theory.

TABLE 4:   Research Questions 1.5 and 1.6 - Findings

RESEARCH QUESTION	FINDINGS
Question 1.5 What are the core concepts of a theory of resilience in the volunteer FRS	1. Relationships 2. Personal resources 3. Meaning-making 4. Culture 5. Leadership 6. Knowledge
Question 1.6 What are the relationships between and among the components	Multiple reciprocal, synergistic relationships between and among components

8.2   RESILIENCE UNPACKED - CORE CATEGORIES AND RELATIONSHIPS BETWEEN
CATEGORIES

The concurrent data analysis surfaced several categories related to resilience, which were distilled or consolidated with further interviews and analysis. Ultimately, six categories: relationships, personal resources, meaning-making, culture, leadership, and knowledge were seen to be 'core' categories, and had several sub-categories attached to them and to each other; the next sections of this chapter will examine those core categories. Table 5 provides

an overview of the categories and their related sub-categories.

Table 5:   Core Categories of Resilience Theory

Categories of resilience	Subcategories of core resilience categories

Relationships	My crew/watch/FRS (peers)
	My family
	  • 'my family' – spouse, kids – taking priority
	  • firefighter family (crew/watch, FRS)
	Friends
	CISM peer support team
	Community – service

Personal resources	Physical
	  • working out, exercise, humour
	Mental/emotional
	  • yoga, self-reflection, mindfulness
	Attitude
	  • positive, optimistic, grounded, hope
	Values
	  • values, commitment, integrity, caring

Meaning-making	Engaging in reflection Debriefing Faith "making sense" of events/outcomes "knowing I did the very best I could"
Culture	"Sense of family" "Brotherhood" Supporting one another "Service" to one another & to the community Connecting to community Engaging in a culture of understanding

Leadership	Personal
	  • leading through 'service'
	  • backing one another up, peer support
	  • role modelling – doing/being the best I can
	  • mentoring – helping one another
	Organizational
	  • 'walking the talk', supporting each other
	  • Leading by example
	  • Service
	  • Being fair, competent

Knowledge	"lifelong learning" Acquiring formal & informal knowledge Developing skills & competencies for firefighting, first responding, "life" Developing "better, more well-rounded people" Becoming self-aware (of skills/competencies/strengths) as well as 'other' aware

It is important to remember however that the core categories of resilience do not exist in isolation of one another; instead, they are reciprocally inter-related. The categories of relationships, personal resources, meaning-making, leadership, culture, and knowledge together constitute a 'system' of resilience in volunteer firefighters and reflects the systems approach to defining resilience. Other researchers have alluded to a broader context of components of resilience (see for example Bonanno & Mancini, 2012; Fletcher & Sarkar, 2013; Masten & Narayan, 2014), but tend to support each other in their attempts to simplify the construct so that it is explainable and relate-able, often missing the relationships between categories which provide the depth and breadth of resilience theory. Although a systems approach is difficult to mentally grasp, it clearly establishes the complexity of the resilience construct.

8.2.a   Category 1 - Relationships

Initially named "social support" in this, and previous, research (Blaney, 2003, 2005; Blaney & Brunsden, 2015), it is evident from this study that social support is an accurate description of the process that occurs between firefighters and their families; however that support is underpinned by 'relationships' that are constantly negotiated in order to optimize social support. The category of relationships includes firefighters' chosen coping strategy of 'talking about' the impact incidents have on them and how they will cope with those.

The people that firefighters speak to most frequently are their fellow firefighters especially the crew they were on the call with, closely followed by their spouse and other family members such as parents (Blaney, 2009, Blaney & Brunsden, 2015), as well as the 'peer support' personnel from the CISM team:

> *There's…camaraderie…it's hard to leave good teamwork at the side of*
> *the road or in the fire truck…if we can communicate as team in there, we*
> *should be able to do it…post-incident [asking] 'hey, how are you? [and]*
> *it's okay to not be okay…it's okay to talk about it (Sam)*

This excerpt demonstrates some of the nuanced subcategories in resilience: camaraderie,

teamwork, communication, and trust. As well, the process of talking about tough calls and firefighter reactions increases the social support and information-sharing or education component of resilience:

> *Right after the call we…discuss it…try to see if people have an issue…talk to them afterwards. We just try to talk about it…something we need to deal with. [People] tend to stay around [after a tough call] and just back and forth back and forth…it's kind of neat, everyone sticks together…people just talk and talk about the call which I think is very healthy (Chris)*

> *We encourage and try to talk about [stress and stress management] from the moment someone joins the department…interview questions [prior to joining FRS] are aimed towards [stress and coping]…[and] we may discuss some more structured ways to put those things, not…aside but incorporate them to be part of you and carry on (Sam)*

The common theme of talking post-incident is complemented by the idea of proactive resilience-building from the very start of the firefighter's career. The focus on health creates shared values and further builds trust as firefighters recognize that resilience is an individual construct as well as an organizational one:

> *Being part of a community [the FRS, and the broader geographical community]…social cohesion…gives us self-worth and [helps us cope] (Andy)*

Firefighters are able to articulate culture, cohesion, self-worth as tools for enhancing resilience; these are not abstract theoretical concepts but are 'lived' by firefighters in TBFRS.

Frankie noted that his spouse can usually recognize when it's been a bad call, one where things haven't gone well operationally or where there has been a bad outcome such as serious injury or death:

If it's been stressful or something there's always…a sandwich…cup of
tea…something to take the edge off. [spouse] will know [because they
have access to radio or pager and listen to the call] and will say 'how are
you doing, hon…anything you want to talk about?' (Frankie)

Frankie's comments highlight the key role of family as the cornerstone to resilience, which also once again highlights the need for the FRS to ensure families are tangibly supported; education, tools for resilience, and various resources for themselves and their firefighter are foundational for families.

The importance of negotiation with spouse/family about time spent with the FRS, both on call and also involved in community events such as fundraising, attending parades, etc. requires ongoing commitment and communication:

It [the FRS] does take a lot of time and energy…my [spouse] has said 'this
week you're away for 3 or 4 nights…the kids have activities'… you just
work around it. And you start to learn it's okay to say no [to some FRS
demands]…family takes priority (Chris)

It's a delicate balancing act – it always is, no matter how long you do
this work – it's constant negotiation between the demands here and
your family (Jamie)

A common message in these and other excerpts from the data is the idea that negotiation about the FRS (negotiating time spent volunteering, parental roles and responsibilities, and overall communication between the firefighter and the family) is imperative and continuous. Time spent as a firefighter, whether responding to the pager and/or representing the FRS at community events must be balanced with family roles and expectations, ensuring the family remains a priority. Assumed, but not frequently mentioned, were the requisite negotiations with employers so that firefighters are able (or not) to respond to calls during work hours.

The CISM process (group defusing or debriefing post-incident) has been cited several times as a key component of the culture of support that is present in the FRS.

> *Knowing there are expected reactions [including no reactions] that are normal…just debriefing with the group about [reactions and] how to cope…hearing that others are going through the same stuff and they are experienced…you are able to cope. Once you accept that you're not bullet-proof and hear from others that they aren't either but that you will get through it…[and] it's okay to feel sad…it gets better. (Shawn)*

> *This [CISM] was never in place 30-35 years ago…you didn't talk about it…and it [the incident] haunted me for months, years even (Frankie)*

> *It gives everyone permission…to be screwed up, to identify what's going on…my feelings are normal…[and] the need to view each other as people with emotional vulnerability…increases the sense of obligation to support each other (Max)*

> *It may be more structured now [CISM interventions] but I don't notice the structure…I'm unconcerned with it…I want to see that others are comfortable, getting past and working through things (Sam)*

Themes of vulnerability in these extracts are bounded by empowerment expressed as knowledge about the human stress response along with conscious implementation of healthy strategies. The value of the CISM program (including the opportunity for verbal ventilation, shared knowledge, and instillation/enhancement of hope) is contrasted with Frankie's remembrance of vulnerability without the CISM program and is a further endorsement for CISM. The concept of 'structure' adds context to the supportive conversations; they are not casual conversations but are focused and intentional, and further build personal capacity and relationships which in turn build resilience. Relationships are the common denominator in the extracts, and overtly and covertly associate resilience to relationships as well as other core categories such as personal resources, culture, and

knowledge.

Social support is a key coping strategy but it is more accurately represented by the concept of 'relationships'. The need to 'talk it out' is not unique to firefighters; it also underpins most psychotherapy processes and many social and intimate relationships. But the key component of social support and talking it out is the trusting relationship that exists between the talker and the listener. The relationships are negotiated and built, they are intentional, and flexible ('sometimes I'll talk to ____ and other times I'd rather talk to someone else – it depends on what's going on for me, and who's around/available'). In the broader context of FRS such as career FRS with multiple stations, dynamic crew rosters, etc. the importance of relationships and their social construction within the FRS raises important questions about how to best support a healthy sustainable social structure and culture; for example, how are new members integrated; how are trusting relationships built and sustained by the common practice of rotating crew rosters; how can less healthy social structures or unhealthy cultures in individual stations be influenced for change, etc.

Social support in and of itself contributes to resilience, but also inter-relates with other components of resilience to strengthen resilience. Social support closely relates to culture, personal resources, education, leadership, and meaning-making – the supportive culture of the FRS, the personal choice of verbal ventilation as a coping strategy, the sharing of knowledge around stress and coping that occurs when talking to another person, the capacity of the FRS to develop informal leadership in the form of firefighters to provide support to one another as a 'listening ear', and contextualizing or making meaning of difficult calls through verbal ventilation.

8.2.b   Discussion Of Findings Of Category 1 - Relationships

Social support has long been implicated as a key component of resilience and there is much evidence around the association of social support with resilience as noted in section 3.5.b. as well as within other literature examined in this thesis: 2.6.a (salutogenesis); 3.3.l (Bonanno's model), 3.3.m (Fletcher & Sarkar's model), 3.3.n (de Terte's model), etc. For example, Bonanno (2004) found that connection with people and perceived presence of social support increases resilience. Iacoviello and Charney (2014) note the positive influence of supportive

social networks on mental health; in turn resilience has been linked to mental health. Shakespeare-Finch (2011) finds that perceived social support increases adaptive coping and decreases levels of distress; social support is a predictor of adaptive coping, and both the giving and receiving of social support influences health. More specifically social support is a mediator for stress and trauma in emergency workers; Regehr and her teams offer significant insight into firefighters and job-related stress, and consistently find that social support plays a key role in decreasing distress (see for example: Regehr, 2009; Regehr, Goldberg, & Hughes, 2002; Regehr, Hill, Knott, & Sault, 2003). Firefighters at TBFRS count relationships as a mainstay of resilience, and in keeping with the literature find social networks offer emotional support, information, and provide tangible and intangible assistance. Aldrich and Meyer (2015) found that social networks play critical roles in disaster survival and recovery across a variety of contexts. Hobfoll (2001) has long been a proponent of social resources as significant contributors to human adaptation, and notes the interplay between social resources and resilience. Berkman and Syme (1979) noted that health is maintained in those who have family ties, close friends, and are married and/or members of groups, teams, other social networks.

In the findings of this thesis, social support is not a random experience but is embedded in the relationships of the firefighters – primarily families and colleagues or 'pseudo-family' within the FRS as overviewed in sections 3.5 and 3.7. These relationships require nurturing and negotiation in order to remain paramount and to avoid being subsumed (Regehr, 2009; Regehr et al. 2005) by the time and energy required by the various expectations within the FRS such as fire suppression, medical response, fundraising, community events. McMahon (2010) noted that support from family and friends requires negotiation, effective communication, and education of family members as to the stressors encountered in the FRS, a view that is echoed by participants in this study. Support from family may be unavailable and/or "complicated" (McMahon, p. 13). Hill (2014) suggests several ecologically relevant processes to support families: creation and delivery of reliable credible messages to families with a focus on normalizing the job, stressors, stress reactions, and resilience; family education early in the firefighter's career such as during recruit training; outreach to families to integrate into the FRS such as invitations to training days. Knowing the role the family plays in sustaining and enhancing resilience in firefighters behoves us to pay close attention

to sustaining and enhancing resilience in those families.

As noted in sections 3.5 and 3.7, seeking support from one another within the FRS in the form of 'talking' about critical incidents, personal reactions, and personal coping strategies is favoured by firefighters globally (Blaney, 2009; Blaney & Brunsden, 2015; Haslam & Mallon, 2003; Regehr et al., 2005), and peer support is favoured over support provided to the FRS by professionals such as employee assistance programs (Blaney, 2003, 2009; Jeannette & Scorboria, 2009; Johnson, 2010). Peer support has been found to bolster resilience (McMahon, 2010). For TBFRS, social support in the form of peer support is a vital component to resilience. A peer's first-hand knowledge of the operational aspects of the organization provides a credible link between the hierarchal levels in an organization, and a link for firefighters and the external mental health professionals who participate in some interventions and act as the referral sources for more formal mental health services when needed. Peers exist within the social network of the workplace. The peer support 'sessions', therefore, are likely to be informal discussions, or conversations, which will have the added feature of skills specifically learned for helping others express and deal effectively with workplace stress reactions. There is a difference between these supportive conversations and the more common social conversations of the fire station. In social conversations, there is mutuality of expression of issues but in a supportive conversation, there is no mutuality; the focus is on the individual who is receiving support. Social support mediates reactions to traumatic events (Paton, Violanti, & Smith, 2003), and peers and family are the social supports most utilized by emergency services providers (Canada, 2014b; Regehr et al. 2003; Shakespeare-Finch, Paton, & Violanti, 2003).

The 'brotherhood' of the FRS is considered a strength in much of the literature about the FRS, and certainly for TBFRS, the FRS 'family' in the context of 'relationships' is a key component of resilience. There have been criticisms of the 'brotherhood' (see for example: Kitt-Robinson, 2010; Regehr et al., 2005) for its genderism and strict adherence to rituals, and for its exclusion of those who do not conform to the prescribed norms and attitudes; in turn, this dysfunctional pseudo-familial process of 'power-over', has been found to create a culture of fear and dependence (Robinson-Kitt, 2010). None of these negative attributes to brotherhood are evident in TBFRS, which may be due in part to the constant negotiation of

relationships between firefighters, the FRS organization, and the families; the relationships are not 'fixed' but flexible and the time/energy bestowed to each relationship is negotiated consistently and repeatedly. The intimate/family relationships take precedence, and there is constant consultation and negotiation of time allotment to the FRS once familial responsibilities have been take care of. Once again however the privileging of relationships requires FRS to ensure that privilege is respected and overtly supported in the form of family education on the roles/responsibilities of firefighters, job-related stressors, stress reactions, coping, and resilience in the FRS.

Regehr's work with the spouses of paramedics and firefighters notes the impact of stress and distress on families, and finds that, overall, organizational stress supports are not available to spouses (Regehr, 2005; Regehr, Dimitropoulos, Bright, George, & Henderson, 2005). Although not overtly articulated by TBFRS, it seems commonsensical to ensure that information about the FRS, workplace stress, common and expected stress reactions, and coping mechanisms that contribute to resilience is systematically offered to spouses of firefighters; education for spouses would provide much needed support to these champions of firefighters and the FRS Studies have shown that this type of support is key to bridging from the FRS to home and to help mitigate the stress of firefighter spouses and families (Blaney, 2009; Regehr et al, 2005;). Another factor contributing to the sense of 'family' versus the gender-laden conceptualization of brotherhood is the easy acceptance and integration of women firefighters at TBFRS, again a cultural construct that anecdotally is shared amongst volunteer FRS but is not necessarily shared in career FRS (Kelley, 2015).

8.2.c   Summary Of Category 1 - Relationships

As one of six categories contributing to a multicomponent theory of resilience, the category of *relationships* surfaced in discussion about coping (research question 1.3) as well as within the context of core concepts of resilience and their inter-relationships (research questions 1.5 and 1.6). Several subcategories that further strengthens the understanding of social support as a contributor to resilience also emerged; relationships as a category is more than social support, and the broader understanding uniquely augments the existing literature on resilience. Peers and families are the most common sources of relationship, and 'talking' is said to be one of the most helpful sub-categories of relationships as well as of personal

resources and culture. The context of the volunteer FRS requires specific efforts to nurture family relationships given the multiple demands on the firefighter, and the family, in the role of firefighter: emergency response, training, community events, etc. As well, although collegial relationships are supported and enhanced by the 'team' approach and culture of TBFRS, social support and relationships may be at-risk in career FRS where rotating shift patterns interfere with team development; Regehr (2009) observes that social supports are lower for experienced career firefighters and suggests that organizational culture and shift patterns are contributors.

In summary, *relationships* is one component of resilience, which interacts with other categories: a 'culture' of mutuality, trust, diversity; personal resources such as verbal ventilation; leadership (formal and informal) that leads through inclusion (vs. blind adherence to rituals); and education/learning about peer support, healthy relationships, family support, etc.

8.3.a   Category 2 - Personal Resources

The category of personal resources seems to align with 'coping' as discussed in sections 7.4.a-c, however, *personal resources* are the assets and coping is the action; coping cannot occur without resources which are foundational to resilience. When discussing the personal resources required for resilience, two sub-categories emerged: physical or external resources, and psychological or internal resources; these are the *assets* available to firefighters to assist with coping and which contribute to resilience.

External resources refers to those resources that one employs to 'blow off' stress and to enhance resilience, and include: exercise, meditation, yoga, various 'activities' that also serve as distraction from the stress reactions. Internal resources refers to the availability of more innate mechanisms: attitudes (humour, hope, optimism, positive attitude, being 'grounded'), and values (service, commitment, integrity, caring), along with integrating/bringing forward 'experience' that are part of who the firefighter is but also can be learned and developed through training and experience in the FRS.

TBFRS firefighters endorse a variety of external physical resources:

> *I've gotta do something physical – bike, walk, just get rid of all the bad*
>
> *stuff by working it out/working out (Sam)*

The common theme of exercise as a personal resource is that it is an intentional and concrete approach to dealing with work-related stressors. Exercise has been linked to resilience in the literature (see for example: Childs & de Wit, 2014; Cotman & Berchtold, 2002; Craft & Perna, 2004) and it is a firmly entrenched resource with these firefighters:

> *If you don't have a healthy lifestyle, it makes it harder to bounce back*
>
> *after bad calls, or any other stress in your life…eating right, exercise,*
>
> *'balance' between work and the rest of your life…[without those] you're*
>
> *more likely to get sick or be stressed for longer (Sam)*

As well, there are internal resources that are accessed during times of stress and following adversity include emotional, attitudinal, and values-based resources. Emotional resources include:

> *…emotional maturity…recognize the emotions we're having…the ability*
>
> *to emotionally process [events] (Max)*

Attitudinal resources were defined as:

> *I'm generally a pretty optimistic person…positive attitude – that helps*
>
> *(Andy)*

And values-based resources include:

> *I just really value the work that we do…I know it's important and that the*
>
> *community appreciates it…[I] think about that when we have bad calls,*
>
> *that we're providing a very important service to a community we care*
>
> *about and who cares about us (Shawn)*

Additionally, Jamie describes some operational components that add to hope and optimism

as personal resources:

> *… it's all about safety and 'everybody goes home'…dividers down the*
> *highway, the apparatus that we have – great strides forward that make*
> *our job, our preparation, easier…so I'm constantly looking ahead at what*
> *other good changes are coming…I think 'hopeful' and 'optimistic' pretty*
> *much describe how I get through the tough times (Jamie)*

Having the capacity for emotional expression is another common theme threaded through the categories of relationships, leadership, knowledge, etc. but it seems most relevant to the category of personal resources. Emotional expression was articulated as:

> *It's okay to say something bothered me…it's okay to say I'm not okay*
> *(Sam)*

> *I cry after calls sometimes – it's just so sad (Jamie)*

> *It's about being real – feeling real feelings and being human (Shawn)*

Having a culture of emotional openness allows for 'venting' of reactions in order to move on and/or look for solutions to distress. Emotional expression helps with acceptance of events and emotions, and to make some meaning of them, and to recognize the opportunity for being supportive to one another knowing the next call may relate more personally:

> *…we have awareness of emotions but suppress it at scene, [and] with*
> *our kids, unless there is a very specific reason. [That's the] thoughtful*
> *intentional part of building resilience. Inside the hall, if you let*
> *something loose, it's appropriate – cursing, anger, tears, yelling, but that*
> *goes back to supportive culture (Bobbie)*

Strong emotions are also evoked by issues of social injustice and inequality such as when citizens cannot afford fire prevention tools such as smoke and/or carbon monoxide

detectors.

Firefighters also use emotional repression during calls in order to contain emotion and to concentrate on the task at hand. Repression after calls is not the culture of this FRS:

> *Just knowing I have the option on the call of saying I'm not okay which*
> *gives me the confidence to push it down and do the job knowing I'll be*
> *able to address it/talk about it afterwards and knowing others are/have*
> *been likewise affected (Frankie)*

Humour was consistently endorsed as a reliable personal resource such as having a sense of humour and appreciating others' humour. Humour was articulated as both an external ('black humour', 'joking around afterwards') and an internal ('having a sense of humour) resource, and is used frequently but judiciously as a personal and as a collective resource.

Experience was noted to be a helpful resource for coping with untoward events – not to the point of being hardened, but recognizing that bad things happen yet firefighters survive those events; this appraisal strategy can be shared with others:

> *Seeing it time and time again…[I recognize] I've done the best I can [but]*
> *it is still a poor outcome…knowing from before…I'll get through it (Sam)*

> *Accepting you are not bullet-proof [comes with experience] (Shawn)*

Having a variety of resources to choose from was recognized among many of the firefighters, and they used similar language to describe this phenomenon, as well as to articulate why it is important:

> *The more resources or 'tools in the toolbox' you have to choose from, the*
> *more resilient you are. (Chris)*

Evaluation or appraisal of resource effectiveness is also part of utilizing personal resources:

None of these work all the time – it depends on the call/situation/your

own state of mind…you need a bunch of things to choose from [and to]

not be shy/afraid to keep trying until they work (Sam) [common

responses were expressed by Frankie, Shawn, Chris, and Bobbie]

Personal resources also relates to culture, in that trust and shared values support resilience:

…not being afraid to reach out/ask others what they've done to deal

with situations in their careers…the more information/tools you can find,

the better off you are in the long run (Sam)

[S]elf-monitoring – sometimes not talking is the healthiest thing –

knowing that makes personal choices okay (Shawn)

Patterns that are evident throughout the data on personal resources are the health and adaptive processes that reject any form of pathology; personal resources are constructs that aid in appraisal of events as stressful (or not), and those resources can further be called upon following appraisal hence co-contribute to resilience. A review of the extracts as well as the raw data reveals an abundance of positive language and healthy resources; positive attitudes, thinking, and actions are associated with resilience (see for example: Tugade & Fredrickson, 2004), and there is a surfeit of these concepts in TBFRS.

8.3.b Discussion Of Findings About Category 2 – Personal Resources

Personal resources is a category that encompasses problem-focused and emotion-focused coping (Folkman & Moskowitz, 2004; Lazarus, 1991), but go beyond simply 'coping' with adversity to building a stronger 'core' of resilience by impacting appraisal of events as stressful or not and accessing resources to manage stress. Personal resources are physical (lifestyles that include engaging in exercise, working out), emotional (engaging in yoga, self-reflection, mindfulness), attitudinal (being positive, optimistic, grounded, hopeful, sense of humour), and values-based (having a sense of service, commitment, integrity, caring). Ensuring firefighters have a variety of core resources, the capacity to know when to access those resources, and the flexibility to recognize which one(s) will serve best in the given

context are also a significant factors in resilience literature (Bonanno, Pat-Horenczyk, & Noll, 2011) as well as within the TBFRS. A selection of personal resources utilized by TBFRS will be explored in more detail below.

Exercise

Exercise has long been known to positively influence mental health (see for example: Cotman et al., 2007; Craft & Perna, 2004; Kramer et al., 2006) and has recently been found to be effective in enhancing resilience (Blaney & Brunsden, 2015; de Terte et al. 2014; Fletcher & Sarkar, 2012). Cotman & Berchtold (2002) link exercise to enhanced brain plasticity and health, and Cicchetti (2010) has linked brain plasticity to resilience. Having multiple options for exercise independently and/or with others are key strategies for TBFRS, and after 'talking' about stress and coping, engaging in some form of exercise is the next choice for 'burning off stress'. In keeping with the literature linking a healthy body to stress appraisal and healthy mind (see for example: Erickson et al., 2010), TBFRS are clear that exercise is foundational to resilience as described in section 7.4.b - coping with PTEs.

Humour

Mancini and Bonanno (2009) recognize that an important pathway for adaptation to adversity is positive emotions, including humour. Sliter et al. (2013) investigated coping humour in firefighters and found that use of humour affected levels of PTSD as well as burnout; they theorize that humour may buffer the emotional and cognitive reactions to traumatic events. Humour (Haslam & Mallon, 2003) promotes camaraderie, confronts adverse events and feelings, and lightens the feelings of darkness and negativity that often follow a traumatic event. McMahon (2010) found that firefighters use humour in the form of kidding around or teasing as a transition from more in-depth emotional conversations "back to the everyday" (p. 56). Jeannette and Scoboria (2008) found that firefighter resilience is enhanced by, among other strategies, the use of humour in order to gain respite from adverse situations and outcomes. Alvarez (2013) explored the use of humour in firefighters and found it to be a common and helpful phenomenon in the FRS, a positive resource that helped to distance firefighters from stressful events. Alvarez reviewed the literature on humour and health and concluded that humour buffers the effects of illness

and positively affects health and well-being. Alvarez concluded that firefighters remain resilient over time through the use of a variety of coping strategies, but concentrated her thesis on the use of humour. Blaney and Brunsden (2015) discovered that the use of humour was a commonly used and articulated coping strategy of UK firefighters; humour was described in terms of being 'black', 'crass', 'very funny but very sick' and was articulated to be cathartic and healing. However these benefits are offset by criticism of some firefighters that the use of humour is 'insulting', 'disrespectful', and 'doesn't work for everyone'; significantly there was also a noted intolerance for those who did not want to use humour (Blaney & Brunsden, 2015).

Humour is endorsed by TBFRS in similar language and intent as the literature; it lightens mood, creates solidarity and a sense of shared meaning, provides a physical outlet for reactions to stressful situations, and is seen as a resilience builder. Humour is used judiciously, and never on the fire ground or on-scene of an incident; it is reserved until firefighters are in the privacy of the fire hall, and if others do not seem to sharing the laugh, it tends to dissipate into a more focused discussion about how people are reacting to the incident.

Alvarez (2013) notes the impact of workplace safety policies and prescribed sensitivity practices that have resulted in a significantly decreased use of humour in order to avoid human resources sanctions. Humour as a "go to" (Alvarez, p. 96) coping strategy is now used carefully if at all, hence this coping strategy is essentially no longer available to many firefighters. As noted, although humour is used by TBFRS it is used infrequently in this age of cell phone audio/visual intrusions which appears to translate into less use of, or more sensitivity about, humour on-station.

The evidence supporting the use of humour in the FRS outweighs the criticisms but it is important to recognize that humour is not a universal practice and can be misinterpreted. However, the use of humour is not an either/or decision; recognizing the diversity of styles of humour and how people interpret humour can allow for more flexible policies and guidelines in order to protect and nurture this valuable coping and cultural resource. To 'ban' the use of humour effectively eliminates an important tool from the personal resources

of firefighters; this, in and of itself, will likely not affect overall resilience, but the intention of resilience-building in the workplace is to ensure as many healthy resources as possible are available and accessible (Mental Health Commission of Canada, 2013c) so it seems pertinent to consider how humour can be better integrated into the toolbox.

Yoga

Yoga, and other mindfulness practices that intentionally focus on the present and bring attention to internal and external experiences have been linked to resilience (see for example: Hartfiel et al., 2011; Shelov et al., 2009) as well as the management of posttraumatic stress disorder, depression, and anxiety (see for example: Johnston et al., 2015). There is evidence that mindfulness positively affects mental and physical health of firefighters (Smith et al., 2011), and firefighters are also starting to recognize the value of yoga as both a mindfulness process and a practice of its own. Some TBFRS members are finding that yoga helps with breathing, movement, relaxation, and mindfulness:

> *…it helps to take some time and just be in the moment [after a tough call] (Shawn)*

> *I've learned that by breathing my way through a stretch not only strengthens my body but it makes me feel relaxed as well, so I feel like it strengthens my body and mind (Sam)*

> *I feel better, happier (Max)*

Overall, mindfulness practices are endorsed by specific members of the FRS, in response to research question 1.3 – coping with PTEs, as well as in relation to resilience, but not to the extent that the literature endorses; mindfulness could be an area for TBFRS to explore in the future as another tool for enhancing resilience in volunteer firefighters.

Emotional expression

Emotional expression is seen as a contributor to resilience; more will be said about

emotional expression in the context of emotional maturity and emotional intelligence in the section on 'Leadership' below but it seems timely to discuss emotional expression as a personal resource because that is the way it is contextualized by TBFRS. Emotional expression differs from *positive emotions*; positive emotions are the experience of 'feeling' and emotional expression is the action of ventilation of feelings that may be either positive or negative.

Expressing emotions was common during the interviews; participants laughed, cried, were excited, angry, and sad when recounting stories of service and resilience. These were spontaneous uncensored and at times raw manifestations of the meaningfulness of firefighter narratives, and were reflective of the range, spontaneity and depth of emotions experienced on a day-to-day basis in the FRS.

Emotional expression emerged as a common resource of firefighters, but is utilized judiciously; expressing emotions was not endorsed as useful whilst on-scene with firefighters recognizing that repression of emotions allowed them to stay focused on the tasks at hand despite the often tragic events and the exposure to human suffering.

Expressing emotions was noted to be helpful in the context of trust and the social network of the fire station, with the crew and with families, and always after the PTE was 'over' and firefighters had cleared the scene. These findings are in keeping with the literature about the value of judicious emotional expression (see for example: Hawker, Durkin, & Hawker, 2011; Jeannette & Scorboria, 2009; Regehr et al., 2002), and the role of peer support (Farnsworth & Sewell, 2011) in creating a culture of trust and safety in which to enable emotional expression. Emotional awareness and use of emotional expression (in the context of trust and peer support, and with personal choice as to the 'depth' of emotional expression) decreases fear of emotion which has been associated with post-traumatic stress disorder in urban firefighters (Farnsworth & Sewell, 2011).

Emotional range and flexibility are related to resilience (Bonanno, Papa, et al., 2004; Waugh et al., 2013) in that resilient people are able to match their emotional responses to emerging situations and are able to change or maintain affect in response to changing contexts.

Firefighters also express admiration for senior members who have shifted their perspectives from 'the old school, suck it up buttercup' to one of talking about reactions to workplace adversity and the ability to say 'I'm not okay, [this call] bothered me'. As noted by Folkman (1984) and discussed in section 7.4.a, emotional regulation is an expected outcome of 'coping', further linking emotional expression to resilience.

Emotions are acceptable and accepted within TBFRS but this is not to say that everyone stands around emoting 24/7, rather that emotions are part of the human experience and are 'normal and expected', and a part of the context and culture of the FRS. The ease with which emotional expression occurs in TBFRS is evidence of the trust, collaboration, and health-focus of TBFRS further linking emotional expression to categories of resilience that emerged in this programme of study especially relationships, meaning-making, leadership, knowledge. This finding is important in that it provides additional knowledge linking emotional expression to resilience overall but particularly in volunteer firefighters.

Positive emotions

Feelings and emotions, particularly positive emotions surfaced when participants were asked about coping with tough calls, and were cited throughout the interviews; positive emotions also arose from the data related to research questions 1.5 and 1.6. Emotions are 'feelings', part of the human affective experience that have cognitive (perceptual) and physical (body) manifestations; emotions are multicomponent responses to stimuli (internal and external), are subjective and personally meaningful, and often fall on a continuum of feelings. Emotions are categorized by Shaver et al. (2001) as love, joy, surprise, anger, sadness, and fear; each of these primary emotions has multiple secondary and tertiary emotions arising from them. Emotions are further described as positive or negative. Although negative emotions have received the majority of attention in psychology, there has been more focus on positive emotions within the context of positive psychology (Seligman & Csikszentmihalyi, 2000). Positive emotions are love, joy, hope, awe, serenity, gratitude, interest, pride, amusement, and inspiration (Fredrickson, 2009); all of these were evident in the data from volunteer firefighters and crossed all categories of resilience.

There are many links in the literature between resilience and positive emotions (see for example: Bonanno, 2009; Davydov, et al., 2013). Tugade and Fredrickson (2004) offer a "broaden and build" theoretical framework for positive emotions noting that resilient individuals use positive emotions to bounce back from and to find meaning in adversity. Broaden-and-build describes the relationship between positive emotions which trigger positive meaning-making which in turn triggers other positive emotions; broaden-and-build acts as a thinking and action tool that contributes to the overall repertoire of personal resources. Broaden-and-build correlates to Antonovsky's (1996) General Resistance Resources (GRRs), the factors that facilitate health – the more resources available, the more healthy individuals and communities are (see previous discussion section 2.6.a in this thesis).

This thesis posits that the constructed theory of resilience in volunteer firefighters adds to the existing literature on broaden-and-build theory. Positive emotions and positive meanings are key contributors to resilience in and of themselves and have been shown to buffer against illness and to impact physical and psychological wellness. TBFRS firefighters use positive emotions such as optimism and positive attitudes ('I'm a pretty positive person overall'), as well as 'looking for the positives' in bad situations/adverse outcomes. Forward thinking contributes to resilience in much the same way by allowing the individual to refocus on the positives of the event or to reconnect with trust in others' capacities. Also, having a forum for identifying emotional reactions 'we talk about emotions' yet recognizing 'it's okay not to be okay' are both viewed as positive expressions of emotion, and allow the opportunity to 'get it out of myself, hear that others feel the same, and then we move on' thereby creating a culture of support and positivity and adding to the social support/relationship category of resilience. Other perceptions of positive emotions relate to 'balance' and in particular 'balancing the good with the bad' vis-à-vis emotions and actions. There is congruence between this constructed theory of resilience in volunteer firefighters and broaden-and-build in that both are emergent, reciprocal, self-sustaining systems of behaviour, cognition, and somatics. The difference is that this theory has clear alignment with salutogenesis, complex adaptive systems, and positive psychology (more will be said about these in section 9.5.b) and goes beyond the broaden-and-build framework by offering greater understanding of the inter-relationships of the six core categories (relationships, personal resources, meaning-making, culture, leadership, and knowledge).

Hope

The definition of hope has evolved since Synder's seminal work (2000) and means an attitude, goal-directed thought and action, and/or cognitive process to achieve goals; in other words, hope is a dynamic multi-dimensional construct. Hope has been explained as an individual trait as well as a process; the individual is the agent of hope (Snyder, 2000). Snyder describes hope across populations and in various contexts, noting that hope is a motivating tool to help overcome tragedy and illness. Similarly dispositional hope in emergency department staff was a mediator for disease as well as a predictor of resilience (Ho et al., 2010). Optimism and hope are cornerstones of a strong sense of coherence (Antonovsky, 1996) and hope is noted to cross cultures and is key to facilitating health. Bernardo (2010) extended hope theory to include "locus of hope… [which involves] internal or external agents, and internally or externally generated pathways" (p. 945); hope's multidimensionality is also evident in Miller's (2002) theory. Hope has been positively associated with motivation, coping, quality of life, positive future focus, relationships, and spirituality (see for example: Kulig, 2001; Penz & Duggleby, 2011).

In the context of volunteer firefighters, hope is seen as a trait and a process; the data from this programme of study indicates that experiencing hope in the FRS aligns with Bernardo's conceptualization of hope as "individual and relational" (2010, p. 948). Hope is an attitude or way-of-being for many TBFRS members and was expressed as 'I'm a hopeful kind of person', 'I always have hope that things will go well', 'I'm always hopeful and optimistic that good will come from these bad calls'. In the literature, hope is one of the positive emotions as discussed previously in this chapter. However, in this thesis, hope emerged as a way-of-being for participants and extends across multiple categories of the resilience theory: relationships, personal resources, and meaning-making (this correlation will be discussed further in sections 8.4.a-c) and as seen in the literature (Penz & Duggleby, 2011). Hope also emerged as a sub-category of culture (sharing values and goals in the FRS support hope), leadership (mentoring and modelling hope), and knowledge (developing competencies for goal-attainment contributes to hope) further extending our understanding of hope.

Hope is an understudied concept yet one that seems to have significant potential to enhance resilience; firefighters note that it is a central component to their resilience. This thesis found congruence between the literature and firefighters' experience and expression of hope. TBFRS individually and organizationally align hope with resilience in all six categories of the constructed theory of resilience. This thesis adds to the hope literature by offering the new context of volunteer firefighters further aligning hope with resilience.

8.3.c   Summary Of Category 2 – Personal Resources

Personal resources as a core category surfaced in relation to questions about coping with PTEs (research question 1.3) but quickly moved beyond simply coping to encompass broader contexts. Coping became a sub-category of personal resources as other subcategories such as 'attitudes' emerged; firefighters differentiated between 'strategies' that were first discussed in sections 7.4.a-c, and 'attitudes' such as hope, positive emotions, etc. Although the effective coping strategies from sections 7.4.a-c were reinforced by the literature and further elucidated in this section of the thesis, it is evident that 'coping' does not adequately describe the array of actions and cognitions utilized by volunteer firefighters in their pursuit of resilience - hence the categorisation of 'personal resources'.

Firefighters, within the category of personal resources, access and utilize internal and external resources to build and maintain resilience; these include: verbal ventilation, exercise, humour, yoga, reflection, hope, etc., all of which are linked in the literature to resilience as discussed in sections 2.7 and 7.4. Seeing personal resources as one category of a system of inter-related pathways of resilience is a novel contribution to the literature; this view advances overall understanding of resilience by aligning it with salutogenesis, particularly Antonovsky's general resistance resources (GRRs), which are the factors that facilitate movement towards health (see section 2.6.a). As well, there is overlap between the category of personal resources and the categories of relationships, meaning-making, and leadership. This brief summary of some of the sub-categories of the personal resources that firefighters find contributory to resilience leads next to the category of meaning-making.

8.4.a   Category 3 - Meaning-making

Reflecting previous research (Blaney, 2003, 2009; Blaney & Brunsden, 2015) indicating

meaning-making is a process embedded in firefighter resilience, questions about meaning-making were included in the interview guide. I define meaning-making as the process of coming to terms with or making sense of events and outcomes. Meaning-making differs from 'meaning made' which is the outcome of the meaning-making process.

In this programme of study both meaning-making and meaning-made were explored through questions such as: How have you made sense or made meaning of this event? How have you looked for meaning in this event? What sense have you made of the event? What are some positives that have come from this event? The idea of 'meaning-making' evidenced itself through responses such as:

> *[We provided] comfort on the worst day of someone's life, in the face of tragedy (Shawn)*

> *Knowing I/we did the very best we could…we executed a sound response…the outcome was decided before we even got there (Frankie)*

> *We are there for the worst day in their life…and make a difference just by being there and doing the best we can for victims and their families (Chris)*

> *I just needed to try and understand why this happened…there is no answer so I decided to look for any good that may have come out of it (Jamie)*

There are common themes of firefighters finding meaning in doing the best they can; providing comfort and support are contrasted by the need to find tangible reasons for bad outcomes on calls:

> *When it [the call, tragic event] doesn't make any sense to me, I talk to the others on the call and/or [my spouse] to see if I can make some sense (Bobbie)*

From these extracts it appears that the process of meaning-making occurs in a variety of ways that are internal (self-reflection) and external (talking to colleagues, family; a more formal process such as critical incident stress defusings/debriefings where questions such as 'what good do you see coming out of this tragedy' are asked and considered if not answered outright). As well making use of personal resources such as 'reflection', and accessing internal mechanisms such as faith and optimism helps with meaning-making. Religion, and religious practices such as prayer, were not endorsed per se by TBFRS participants, however 'faith' was mentioned or alluded to in response to questions about coping strategies and also in relation to the questions about meaning of events:

>*I have faith in the crew [that they did a good job] (Jamie)*

>*I know in my heart that we did the best we could (Shawn)*

>*I don't know the answers…wonder about it…ponder for a while…I'm not*
>*sure there is always an answer or a reason for why things happen (Chris)*

Many participants described a process of cognitive appraisal/reappraisal as both the process of meaning-making and the outcome of meaning made. For example:

>*I just thought about my role as a firefighter, and know that there's only*
>*so much we can do (Andy)*

>*I thought about the limitations of being a firefighter…it [the outcome]*
>*was decided before we got there, before we even got the call…there was*
>*nothing more we could have done (Sam)*

>*Even though I was so sad for those people/that family, I went over the*
>*call and know that we did the best we could, we did a good job, it was*
>*technically a really good response with a very bad outcome in spite of*
>*our best efforts (Jamie)*

Meanings made related to learning that good could come from the event, and knowing that everyone did the best job they could do. Firefighters note that meaning (making and made) is clearly related to resilience:

> *…your first one [bad call] I don't even know if you process it, you're just kind of there, you're watching…then as the years go by you just develop that sense [of going through the process of meaning-making]…It's like putting your gear away and cleaning up in preparation for the next call…you think about it, talk about it, work through it…just take some time to think and talk about [the event and the negative outcome]…it's actually helpful in the rest of your life (Chris)*

> *I analyse things…what did we do, what didn't we do, what can we learn from this…thinking about stuff…thinking about how others are affected…process it…[it's no longer] putting white stuff on red stuff…so figuring out how to deal with doing CPR on someone who looks like [a relative/friend]…how to help the others deal with the unexpected…if you can figure it out, learn from it, it makes you more resilient (Frankie).*

Overall these extracts offer insight into the service provided by volunteer firefighters: actions related to operations but also emotional aspects of compassion, caring, personal and organizational values about life and death as they work on finding meaning in the services they provide.

8.4.b   Discussion Of Findings About Category 3 – Meaning-making

Meaning-making in this study has been found to be another component of resilience and has been supported as such by other literature (see for example: Bonanno, 2013; Deppa, 2015; Jeannette & Scorboria, 2008). Meaning-making is described as reflection, debriefing, faith, making sense of outcomes, trusting self/'knowing I did the very best I could'.

In the last 50 years, the literature that is most cited for its in-depth theoretical and practical explorations on meaning-making are Viktor Frankl's works such as *Man's Search for Meaning*

184

(1984). Frankl's thesis that meaning-making is the essential component to surviving and thriving against adversity suggests disequilibrium is a prerequisite for growth or change despite man's general focus on maintaining or re-establishing equilibrium. As well Frankl notes that the tension between what/who one is and what/who one can become is the catalyst for meaning-making and resilience in the face of trauma, and that having a 'forward focus' including goals, tasks, and/or relationships for the future allow one to survive adversity. Frankl frequently cites Nietzsche "he who has a *why* to live for can bear almost any *how*" (Nietzsche cited by Frankl, 1984, p. 126) noting that having current or potential meaning that can be evoked will allow that meaning to be lived for. Frankl further suggests that man finds meaning in the world rather than within himself, requiring engagement in something other than oneself – a way-of-being so often reported by firefighters (i.e. being in 'service' to the community). Frankl notes three different pathways to finding meaning in life. The first path requires creating something or doing a deed (i.e. providing a service to the community; teaching fire safety in schools); through the action of work or creating something outside of oneself, meaning can be found. Secondly, experiencing relationship with something or someone (a job well-done, 'saving a life', 'teamwork', or something as nondescript yet sustaining as relationships with loved ones) allows us to be moved by nature or relationships hence gives meaning to life. The third path is transformative in nature: transforming adversity and its attendant outcomes; converting suffering into change or action, the rising above oneself; the capacity to turn adversity into achievements; and/or finding optimism in the face of tragedy. This transformational path is contextualized by firefighters when noting they found solace in knowing they did the best they could do in-the-moment during an incident. Another example of transformative meaning-making was the experience of being with someone at the time of death and ensuring the victim was not alone when dying. This also ties back into the firefighter definition of resilience as transformative.

Meaning-making is related as well to hope which I previously discussed within the component of personal resources. Hope theory notes the relationship between hope and meaning-making (Ho & Lo, 2012) in emergency department staff particularly in relation to goal setting, adjusting goals to meet changing situations, and using willpower to overcome adversity; these findings are similar to Frankl's pathway to meaning through work, deeds, or

expectations for life. In a parallel context, hope is a common theme underpinning resilience in the FRS, with hope for positive outcomes (such as Frankie's comment 'everybody goes home') and hope to minimize suffering (Jamie and others' sentiments 'we did the very best we could') as ways to make meaning even when calls have a negative outcome.

In contrast, Bonanno (2013) questions the importance of meaning-making, and importantly, suggests we consider meaning-making as both positive and potentially negative given specific contexts. He suggests a broader framework for the concept of meaning-making by using Park's (2010) model that defines 'global' meaning-making as beliefs about self and the world, worldviews that when challenged by adversity result in distress; attempts at meaning-making alleviate the distress. Park and Bonanno contrast global meaning with 'situational' meaning-making that results from appraisal of specific situations as threatening or controllable; when the situational stressor does not challenge worldviews then meaning-making is not needed. Both of these definitions are relevant to volunteer firefighters – there are firefighters who look for meaning in the outcomes of events relative to themselves ('I did the best I could') and a more global context recognizing the event was too far gone prior to their arrival to influence the outcome ('this was a done-deal before we got there – we were there to minimize collateral damage'). Additionally there are those who seek ways to control/prevent subsequent negative outcomes through seeking learning from the situation; finding positives in adverse conditions ('there's always something to learn'; 'try to find the positive in a bad situation') yet do not seek nor endorse the need for meaning-making.

Bonanno notes that no single strategy (meaning-making, meaning-made, or no attempt to find meaning) is always adaptive or helpful, and the usefulness of any strategy depends on context (such as the culture of the FRS) and temporality (for example, the opportunity for verbal ventilation post-incident) as well as the particular form of meaning making that is used (formal or informal conversations about tough calls, reactions, and coping). Bonanno also argues that it is not meaning-making but "flexibility" (p. 153), the judicious use of a variety of resources as well as regulation of emotion, that are key to resilience; flexibility requires having a 'toolbox' of strategies to choose from and the wherewithal to actively choose one or more depending on the situation. The concept of the toolbox and flexible choice to aid resilience is endorsed by volunteer firefighters in their descriptions of various

coping strategies within the context of 'personal resources'; however they also endorse the broader conceptualization of resilience as inter-related categories that include personal resources but also meaning-making. These ideas also further the perspectives on "minimal impact resilience" (Bonanno & Diminch, 2013, p. 379), the adaptation/adjustment of adults exposed to acute events. Minimal impact resilience refers not to the acuity or effect of the event but the temporality of it (time-limited, acute events similar to the adversity faced by firefighters) and the resulting "stable trajectory of healthy functioning" (p. 382) that is common amongst firefighters; that stable trajectory at times includes meaning-making.

Meaning-making as a core category of resilience correlates with Antonovsky's components of sense of coherence particularly the component of meaningfulness, the motivation to see adversity as a challenge to be overcome (Lindstrom & Eriksson, 2006). The examples of meaning-making articulated by firefighters are rife with optimism and hope to minimize the impact on the suffering of others as well as themselves in the context of work-related stress. The idea of service contributes to meaning-making as well as meaningfulness as firefighters simply do their jobs – finding meaning in the tasks and service they provide to individuals and the community.

8.4.c   Summary Of Category 3 – Meaning Making

In response to research questions about core concepts of resilience in volunteer firefighters, meaning making emerged in the context of their perspectives of processes such as cognitive appraisal, verbal ventilation, analysis of events/self, etc. that assist in coming to terms or making sense of events and outcomes. Meaning-making is related to hope and optimism which in turn are related to personal resources; these findings are in line with the literature but are unique in this context. Methods of making meaning such as talking to colleagues and/or family are linked to social support as well as culture and leadership which will be discussed in the following sections. This section of the thesis has articulated meaning-making in the context of volunteer firefighters and adds depth to understanding firefighter resilience by conceptualizing resilience as a system of dynamic inter-related pathways that include meaning-making; meaning-making concepts such as hope are flexible and situationally or globally responsive, and contribute to a sense of coherence hence salutogenesis in volunteer firefighters.

8.5.a   Category 4 – Culture

The concept of culture as a category of resilience surfaced during the initial interviews in response to questions about definitions of resilience and contributors to resilience. This is in keeping with literature that notes the need to consider culture and context when defining resilience and developing interventions or programs to enhance resilience (see for example: Panter-Brick, 2014). Culture and context were defined in section 2.3 of this thesis; culture refers to a system of learned values, beliefs, behaviours, and language shared by a group and this definition is congruent with the understandings that emerged from the data in this programme of study. Firefighters were clear that the culture of TBFRS aids in resilience overall and particularly after tough calls.

Max notes that despite the inherent hierarchy within a paramilitary organization such as the FRS, healthy culture allows flexibility in the organizational structure; flexibility links back to meaning-making and relationships:

> *[The FRS is] historically male-dominated, socialized not to talk about*
> *feelings…that's changing…[to] a culture of acceptance [of others'*
> *differences] and even the hierarchy can help create a more healthy*
> *culture because it flattens at times to consider everyone's needs (Max)*

Chris refers to the culture of health and support, and again, despite hierarchal structure, the human side of firefighting comes to the fore as firefighters support one another:

> *Having a culture or department that values and supports at all*
> *levels…talking to other guys…sharing the story…saying I know that one*
> *really bothered you, what part of it? (Chris)*

Max articulates the social ecology of resilience similarly to Ungar (2008); the comments contrast the existing social construct of resilience with a lack of culture and alludes to decreased resilience in the face of isolation and absence of community:

The sense of community – there's social value, social cohesion and that

social cohesion confers self-worth which in turn helps coping. Lacking

community results in isolation, decreased self-worth, fewer options and

you feel fear, hopeless, pathetic (Max)

If other FRS do not perceive themselves to be resilient, it seems practical to look into the social and cultural norms, attitudes, and behaviours as well as other categories of resilience. Max defines culture and breaks down the concept into subcategories that reflect relationships between culture, personal resources, relationships, and education.

Culture is the general unspoken way to conduct yourself…there's a

closeness in the FRS…[culture] has functional value. It's still a hierarchy

where someone's in charge, but there's flexibility, feedback, listening,

valuing perspectives (Max)

The participants spontaneously spoke of the culture of TBFRS, and discussed the relationship between resilience and culture:

[The culture is one of] integrity, honesty, interested in each other;

teamwork (Bobbie)

Mentoring…increases mental fortitude…confidence; [culture supports

one to] go through the motions, fake it til you make it – eventually you

learn to 'be' confident because the culture supports you to try stuff safely

and the senior guys tell you they had to 'learn' to be confident too…so

it's just really supportive as you learn (Andy)

Although these are diverse perspectives on culture and resilience, the common themes of teamwork, relationships, and knowledge are clear.

Creating trust and having flexibility were two descriptors that were used extensively when discussing culture:

Flexibility in the culture…flexibility frames culture; flexible enough to

compromise but structured enough to keep everyone safe (Andy)

Trust – we have each other's backs (Bobbie)

Bonanno et al. (2011) also noted the role of flexibility in the availability and accessibility of resources or tools to build resilience; this finding supports existing knowledge about resilience and adds to the understanding of resilience in volunteer firefighters.

A positive organizational culture is also seen to be resilience-enhancing by TBFRS. Members discussed how language plays a role, noting that positive attitudes and language build positive attitudes and health. Focusing on the positives of volunteer firefighting (service to community, sense of accomplishment, active involvement in community, etc.) contribute to TBFRS culture as well as balancing out the potential risks of the job:

It's just as important to be reinforcing and [to] reframe from the

negative to positive side of the fire service…it's more appealing…when

we can be positive, effect change, give service…[and] positive attitudes

can be enhanced (Sam)

The term 'brotherhood' has been synonymous with the FRS in literature and popular culture (Regehr et al., 2005; Robinson-Kitt, 2010). However when I asked about 'brotherhood' in the context of culture, participants invariably corrected me by offering similar sentiments:

It's more like a family than a brotherhood…just like a family you develop

closer relationships to some members than others (Frankie)

Not so much brotherhood as family – it's not the old macho suck-it-up

buttercup mentality but more about supporting and understanding one

another – that's more like family than brothers – plus we have women in

this department so brotherhood just doesn't fit [as a descriptive term]

(Max)

[Culture is] inclusive, supportive (operationally and otherwise), flexible,

encouraging; once there, we and the department tend to get

stronger/better through the culture. (Sam)

[Over the] past few years has had shift in culture – empowerment,

spouses included, sense of support to one another…culture of checking-in

and interest in each other's mental health – self-activated system of

support – everyone has right/responsibility to support each other,

understand, support individual strengths, accepting each other's ways of

assessing the impact and coping; stereotype of 'we don't talk about this'

just does not exist in this department. (Shawn)

These are insightful perspectives about culture and the evolution of culture beyond the brotherhood; the concepts articulated by firefighters such as equality, mutuality, relationships, and flexibility have been shown to correlate to resilience (see for example: Hinton & Kirmeyer, 2013; Iacoviello & Charney, 2014). These findings support current understanding of cultural contributors to resilience and also add to the existing literature by demonstrating the evolving culture of the FRS.

An aspect of volunteer FRS that seems to be forgotten at times is the need for flexibility in the demands made upon those who volunteer their time/energy. The traditional structure and hierarchy of the FRS may need to shift somewhat in order to accommodate volunteers with the increasing demands on the time and energy of firefighters; this is an unexplored aspect of FRS literature and the findings here are foundational to future research. The culture of TBFRS was noted to be:

…structure (training requirements, expectations to show up at a minimal
number of practices…) but when you're working with volunteers you
have to work around the people at times. [It's important to have the]
ability to negotiate needs/training, to consider everybody's unique
situation in order to retain members…so flexibility is even more
important…keeping everyone safe, meeting training standards, but
staying flexible and attuned to people (Andy)

The shared values of service and the connection to community were mentioned in the context of culture as well:

[Everybody is] trying to make a difference, to help, help people out…in
the community – lending a hand – that's what the culture is (Max)

It's a privilege…to be part of someone's worst moment/worst day, it's
what we do… you have training to do this and can do it; we are provided
with training therefore there is a mutuality – give & take of training &
service [to the community] (Shawn)

The taken-for-granted service aspects surfaced over and over again in the data, across multiple categories, leading to questions about the relationship between service and resilience; this will be further articulated in section 8.8

8.5.b   Discussions Of Findings About Category 4 - Culture

The idea that culture contributes to resilience is not new particularly when looking at organizational literature (see for example: Luthans et al., 2006; Wright, 2003; Wright & Quick, 2009; Youssef & Luthans, 2007) nor is it a foreign concept to literature on resilience in children (see for example: Masten & Narayan, 2014; Panter-Brick, 2014). It was however a surprise for me to hear it highlighted as a contributor to resilience in firefighters; I can find no evidence that culture has been explored in other emergency services literature and culture in the FRS is a unique finding in this programme of study. However, in the developing field of positive psychology, positive organizational behaviour (Youssef &

Luthans, 2007) including concepts of positivity, hope, and optimism as well as the focus on worker strengths and capacities have been shown to increase worker well-being and resilience (Avey, Luthans, & Jensen, 2009; Youssef-Morgan & Luthans, 2015). Contrasting Youssef-Morgan and Luthans' view that resilience is the causal mechanism for well-being, in this study firefighters view well-being and optimism as causal variables of resilience. This chicken-egg argument is intriguing but diverting from the current study where volunteer firefighters have no doubt cultural components such as hope, optimism, and well-being are related to resilience, and that a changing culture within the FRS (from hierarchal, power-over, and silencing to a culture that frequently has a flattened hierarchy, values diverse perspectives, and is collaborative) contributes to resilience. Luthans & Youssef (2007) have also linked resilience to improved worker performance, increased emotional stability, and greater organizational commitment hence contributing to positive workplace culture; this view is shared by members of TBFRS who note that the positive culture of their FRS builds and maintains collective and individual resilience. Paton et al. (1998) have long advocated that socially supportive work environments and organizational flexibility positively influence occupational health outcomes, a perspective that is endorsed by TBFRS.

As noted in the section on 'relationships', a common conceptualization about culture in FRS literature is the idea of 'brotherhood'. It is unfortunate that this gender-laden term is historically bound to the traditional male-dominated FRS with its attitude of 'machismo' and 'suck it up buttercup' approach to managing the stresses inherent in firefighting (see for example Kelley, 2015). However, the participants in this research were very clear that the culture of machismo is passé, and although not everyone in TBFRS is comfortable with talking about reactions and coping, overall the shift in culture to one of awareness of the risks and rewards of the FRS, and the recognition of strengths and capacities of individuals effectively eliminates gender-based stereotyping in TBFRS.

When looking into the concept of 'culture' as a category of resilience, I found a dearth of literature relevant to firefighters and volunteer FRS in particular. Ultimately I relied on Lisa Robinson-Kitt's thesis to provide a historical perspective of firefighter culture; not only does Robinson-Kitt offer an in-depth analysis of the possible mental health impacts of a firefighting career, the thesis is one of a very few analyses of firefighter culture and one that

highlights the risks of continuing to adhere to traditional hierarchal and "potentially oppressive and politically incorrect aspects of the job" (2010, p. 258).

In contrast to Robinson-Kitt's findings, members of TBFRS note the positive influence of culture on resilience but define culture more as a 'firefighter family'; the familial culture has common values of service, teamwork, and communication that together create an organizational culture of strength, well-being, and support rather than blind adherence to outdated ways-of-being as individuals and an organization.

Brunsden, Hill, and Maguire (2012) note the role of organizational cultures in the successful implementation of stress prevention and intervention programs in emergency services. They cite the interplay of various processes such as labour relations, demographics, perceptions of self within the broader context of a rescue organization, etc. as potential barriers to positive and supportive organizational culture. Biron and Karanika-Murray (2012) suggest that organizational processes as well as individual interventions are necessary to reduce or eliminate the negative effects of workplace stress yet note the lack of evidence for organizational-level health programs. The idea that culture can enhance individual resilience is certainly endorsed by TBFRS when they note that the culture encourages and supports personal growth ('makes me a better person') and also with the recognition that a collective of resilient individuals creates a resilient organization or culture.

Idan, Braun-Lewensohn and Sagy (2013) link higher collective sense of coherence (SOC) to well-being and, previously, high SOC has been correlated with collective as well as individual resilience. In keeping with this literature, TBFRS firefighters cite the culture of the FRS as a key component of resilience, noting that the sense of 'family' ties them together and allows them to reach out to one another during/after adversity; the relationships with their natural and firefighter families supports resilience, well-being, and hope – all characteristics of high SOC, and pertinent to health, health promotion, and salutogenesis.

Benz et al. (2014) also note that culture is a powerful influence on health and contributes to health through multiple pathways, a key theme in Antonovsky's discourse on salutogenesis. Two aspects of culture that Antovosky refers to throughout his writings are *cultural stability*

194

and *cultural integration* (Antonovsky, 1996; Benz et al.). Cultural stability, in the case of TBFRS, means a stable organizational structure, a history of service in and for a community, and the sense of belonging that it is evident in the culture of the FRS, which in turn contribute to a strong sense of coherence (SOC); the SOC is evident in firefighters' commitment to training (manageability), in their ordered response to emergencies (comprehensibility), and in their orientation of service to their community (meaningfulness). Cultural integration ('fitting in' to a culture, in this case a culture of the FRS as a service-oriented positive inclusive group that shares ideals, information and social activities) contributes to a strong SOC as well through the FRS culture's capacity for comprehensibility (the culture is reasonably structured and ordered with, generally, predictable outcomes), manageability (the FRS provides the resources including training that are necessary for firefighters to do their job), and meaningfulness (the culture of the FRS is worthy of investment of time and energy). Antonovsky's idea that culture influences resilience and health (Benz et al., 2014) is evident in his overt links between cultural stability, cultural integration, and health (Antonovsky, 1987, 1996); this relationship is evident as well in firefighters' views of culture as a key component of resilience, particularly the findings that service, 'positive energy', the 'firefighter family', and connection to the community are direct contributors to resilience.

The category of culture aligns resilience with positive psychology as well as with 'relationships' of support, trust, and positive attitude that are evident in this research. Trying to conceptualize 'culture' in a reductionist way leads to gaps in our understanding of the concept and also limits our ability to recognize how culture plays a key role in resilience. If, rather than thinking about firefighter culture as a sum of its parts (i.e. brotherhood, structure, positive attitudes, etc.), we consider it a *complex adaptive system* (CAS), we have a framework for understanding how culture can have the capacity to create, support, and enhance resilience and an opportunity to consider how culture as a complex and adaptive system interacts/relates to other categories of resilience. Complex systems theory or complexity theory investigates how order emerges from apparent disorder and chaos, and how micro-level actions affect emergent behaviours and overall macro-level outcomes (see for example: Amagoh, 2008; Lansing 2003; Schneider & Somers, 2006). Within complexity theory, the interactions among the components of the system result in patterns of behaviour

195

and structure that, through the instability of change, can further result in creativity, innovation, and new behaviours at the macro-level of the system. Also implicated in complexity theory is the recognition that systems are dynamic yet have counterbalancing mechanisms that help to balance the constantly shifting interactions that create order and disorder (Neumann & Fawcett, 2011). More will be said about CAS later in this thesis in relation to the idea that resilience is itself a CAS.

8.5.c   Summary Of Category 4 - Culture

In summary, culture was articulated as shared values, collaboration, support, understanding, positive energy, optimism, and service-orientation. Culture is seen as a core category of resilience as defined in this programme of study in response to the research questions about conceptualization of resilience and relationships between categories of resilience. There are many links between culture and resilience in the literature although culture is frequently neglected when defining resilience and providing interventions to build or maintain resilience. A culture that supports resilience is one that 'lives' its values of service and support, encourages and mentors others to be self-aware and open to talking to one another, provides opportunities for meaning-making as well as focusing on the tasks of the FRS, and encourages individual and organizational leadership and knowledge-sharing.

8.6.a   Category 5 - Leadership

Leadership was another 'surprise' finding in this programme of study of resilience in volunteer firefighters. Individual and organizational leadership is seen as a strong component of resilience – without effective leadership, the people and the organization will falter and become less resilient. However, despite the FRS having a traditional hierarchal structure, leadership at the individual level is seen to support the designated or formal leaders that are part of the hierarchy. And the formal leaders have specific qualities that allow flexibility and collaboration despite the hierarchy, which in turn leads to a sense of belonging, sense of purpose, and accountability for all members whether designated or informal leaders.

Some of the qualities that were mentioned consistently by participants that the 'formal' leaders demonstrate:

Leads by example – never asks you to do something that they wouldn't
do it; mentoring – make a point of teaching others; if you're interested in
listening, they will share/teach (Andy)

Back people up; be fair, competent – lead by example (Jamie)

Integrity, consistency, practice what you preach & be consistent, then
others will follow; trustworthiness/charisma – seeing them work, they
inspire others to be like them – there's this aura – the senior members
demonstrate these values – integrity & consistency – qualities within
each senior member. (Andy)

Confidence/trust in them; experience (life & FRS); knowing they won't
ask you to do something they wouldn't/haven't done themselves
(Bobbie)

The idea of a flexible organizational structure as a contributor to resilience is articulated in the following excerpts:

If there's a critical mass of resilient firefighters with a crappy leader, can
they maintain their resilience – yes, but with good leadership it makes is
soooo much easier (Jamie)

There's a flattened hierarchy yet ultimate accountability, responsibility of
formal leadership yet everyone's opinion is heard, considered (Max)

Personal insights and personal development were linked to leadership:

I'm a better person from being in department – they help you work on
your attitude…[maintaining] mental calmness – translates across to life
(Andy)

These personal capacities that are the by-products of leadership have been correlated to

resilience (see for example: Chamberlin & Green, 2010; Everly & Links, 2012) in high-risk professions but this programme of study provides the only data that I am aware of that situates leadership as a core category of resilience.

Shawn, in heartfelt and succinct fashion, summarized the relationships between leadership and resilience:

> *Resilience starts with leadership – when a station is healthy, bad incidents can be dealt with more quickly/easily. Poor formal leadership causes dissension, people wanting to leave; when an incident happens, you are more vulnerable with no safety net – may cause a correction but more likely spirals into more chaos/distress. Talk about stress management at all levels – these should be normal conversations that are 'led' by everyone but particularly those at the top. Leadership fosters resilience. (Shawn)*

Informal leadership is seen as:

> *Everyone is this department is a leader by virtue of what we do – provision of service to community; consistency – being available, showing up; willingness to learn, to put your own ego aside; trying to do the best job I can (Andy)*

> *Commitment to community; mental fortitude, skills sets, confidence/self-esteem – learn these through practice and working with one another [as a team] (Frankie)*

Leading by example; 'doing' then people follow; working for the community/FRS; informal leadership – willingness to put self out there; seeing things that others don't, sharing that knowledge/experience; showing initiative, forward-thinking, going beyond the superficial – contributes to resilience by doing, showing, sharing, and not quitting 'til the job is done (Bobbie)

Attitude starts at top but it's also how we interact, how we 'be' the FRS, it doesn't matter whether it comes from 5 stripes or no stripes; members that have no rank but are the 'yellow hat' firefighter are leaders – we are all always a leader, set an example [for one another, for the community] (Sam)

Common themes in the data are the inclusiveness of the concept of leadership – each member of the volunteer FRS has the potential to lead – by example, with insight and perseverance, and with diverse approaches – all of which contribute to a solid core of shared values and culture of resilience.

Linking forward from the potential for everyone to lead and/or be a leader formally or informally within TBFRS, another theme is the value placed on peer support, and the recognition that the role and function of peer support is a form of leadership in and of itself.

I had not considered leadership to be particularly related to resilience, and I haven't seen 'leadership' to be part of any of the existing models of resilience. Obviously this is a gap in our knowledge about resilience in the context of the FRS. The closest relationship I can find between leadership and resilience is in the developmental and ecological literature that suggests 'strong role models' 'capable caregiving and parenting' (Masten, 2015), and the support systems and interactions between those systems that aid and sustain childhood resilience: qualities of the caregiver, parental support and expectations, community cohesiveness, etc. (Ungar, 2011). Further analysis about leadership as a component of resilience in the FRS is needed but for now, the final word in this section goes to Jamie:

Formal leadership has responsibility for human resources, and resilience needs to have its own category within human resources – recruitment, retention, resilience. The leader/leaders need to have their own resilience in place. Resilience can be created, enhanced, supported by formal leaders but also informal leadership. Anyone can be a leader and anyone can be resilient – the two are inextricably linked. (Jamie)

8.6.b   Discussion Of Findings About Category 5 – Leadership

Leadership as a category of resilience can only be seen as such if we are able to re-think our ideas about leadership. Firefighters in this study describe two facets of leadership that are key to resilience: individual and organizational.

Individual leadership qualities and styles that are described by firefighters make significant contributions to our understanding of resilience. As noted by Sam "resilience starts with leadership – when the station is healthy, bad incidents can be dealt with more quickly/easily", a perspective that is shared by other members of TBFRS. Individual leadership has been best described and discussed by Drucker (2001, 2005) as the personal qualities and skill sets that contribute to surviving and thriving in rapidly changing environments. To Drucker (2001), everyone is a leader, and to lead others one must first identify and enhance their own personal strengths. TBFRS firefighters recognize and embrace this concept, identifying a wide array of personal leadership capacities: mental calmness; the ability to put one's ego aside; active commitment to community; mental fortitude, confidence/self-esteem; leading by example. All of these correlate with Drucker's definitions of leaders: willing to develop and place oneself where the greatest contributions can be made; improve oneself but concentrate on improving personal strengths; be alert and engaged in the work and the world around (2005). TBFRS have said they value skills and humility; noting that not every firefighter is skilled at all required tasks, they give the example of a firefighter who is not comfortable on ladders but excels at knots and driving hence leads junior members by teaching and supporting in those skill sets.   Support from colleagues and supervisors, along with proactive coping, has been found to mediate burnout (Angelo & Chambel, 2014); recognizing formal and informal leadership styles and skills allows each firefighter to reciprocally experience support from one another which firefighters

indicate is a contributor to resilience, and which is supported below in the discussion about peer support.

Kouzes and Posner (2012) link exemplary leadership to resilience in individuals and organizations. They describe other personal qualities that leaders must have: credibility, honesty, forward thinking, competency, and the capacity to inspire, all of which were endorsed by TBFRS. Other aspects of individual leadership that contribute to personal and organizational resilience are perspectives and practices that were also articulated by firefighters: abilities to 'see the glass as half full', 'walk the talk – do what you say', 'help others, share knowledge', 'mentoring', and 'being willing to challenge the status quo – ask questions, look for the rationale', all of which are fundamental practices of exemplary leaders (Kouzes & Posner).

Several firefighters in this study attribute 'emotional awareness' and 'emotional maturity' as salutary to resilience, perspectives promoted by Yukl (2002) who sees both emotional maturity and emotional intelligence as fundamental functions and attributes of leaders as individuals and as team members. Having emotional maturity requires one to have awareness of one's strengths and needs for self-improvement, be emotionally stable and have capacity for emotional self-regulation, and to care about others – all features of leadership and personal resources articulated by TBFRS. Emotional intelligence is the "extent to which a person is attuned to [one's] own feelings and to the feelings of others" (Yukl, p. 196), and inter-relates with emotional maturity through features such as self-awareness, reflexivity, empathy, emotional self-regulation, and emotional expression such as appreciation and positive feelings. As described by firefighters, having the capacity to be reflective and to have emotional insight adds to one's 'toolbox' of skills for overcoming adversity and for being resilient. Further, emotional intelligence helps in developing and maintaining social networks, and supports the culture of teamwork, emotional expression, and connection to one another and to the community, all key components of resilience. Looking beyond individual leadership as a category of resilience, the idea of organizational leadership has been shown to contribute to resilience (see for example: Everly et al., 2010; Tehrani, 2011; Youssef & Luthans, 2007) through similar skills and processes as individual leaders. From the organizational leadership perspective, I posit that TBFRS engages in

'complexity leadership' (Uhl-Bien & Marion, 2008). In looking at how I came to understand complexity leadership, I reflected back to when I completed a Masters' degree in leadership and training (organizational development was the main focus of the 'training' component); during the program, I was introduced to a variety of leadership models including 'traditional leadership' and 'transformational leadership'. Traditional leadership is described as top-down processes with focus on control to motivate individuals to align with the organizational vision (Uhl-Bien, 2012); transformational leadership is also top-down but with the added bonus of moral and ethical commitment by the membership to the leader and the values of the organization (Kouzes & Posner, 2012). I enthusiastically embraced this approach to leadership but met with much 'push back' from my organization and in further moving through various organizational systems in the years subsequent to my Masters' education, I found that there are significant limitations to traditional and transformational leadership.

This finding is supported in more recent literature which speaks about traditional leadership as the: lack of innovation by leaders with a reliance on tradition and 'old' ways-of-being in organizations hence an inability to move forward or to keep up with a changing world; lack of organizational culture hence little cultural awareness by the leader resulting in an 'unknowing' about the organizational culture and the people within the organization, further leading to a lack of cohesion and productivity within the workgroup; and linear thinking (Weburg, 2012) that restricts innovation, creativity, and further stagnates the organization and the people within it. An example in the literature of an institution that exemplifies traditional leadership happens to be healthcare, and Weburg notes that traditional leadership results in a delay of "17 years for new research to be implemented at the bedside" (p. 271), a stunning statistic that highlights the need for alternative leadership processes not only in healthcare but in any organization that functions in the 21st century and faces ongoing change to the ways of 'doing business'. Unfortunately I also experienced this when attempting to apply principles of transformational leadership within the traditional model in healthcare; there remained to be little value placed on innovation, cultural awareness, and complex thinking – a disappointing experience that seems reflective of the chaos in healthcare globally: cost overruns, focus on technology to cure illness instead of looking at ways to enhance health, inability to move beyond traditional ways of delivering illness-care, etc.

However, when interviewing the firefighters of TBFRS, what resonated was the fact that leadership was mentioned at all as a facilitator for resilience, but more so the way leadership was described by participants: collaborative, interconnected, relational, and adaptive.

An example of individual and collective leadership mentioned in the interviews is the CISM peer support process. Leadership is evident in the language, thoughts, and actions of the peer support personnel as articulated by the participants in this programme of study – the peers recognize the value of social support, meaning-making, and education; they have a wide array of personal resources to aid in the development and maintenance of resilience; they are active leaders in the FRS, by virtue of their interest in others as opposed to their rank and role; and they are foundational to the 'culture' of resilience and health within the FRS. Peer support is known to confer protective effects and to enhance health (see for example: Sunderland & Mishkin, 2013), and specifically supports resilience (Robinson et al., 2015). The Mental Health Commission of Canada (MHCC) notes that peer support enhances mental health and MHCC recognizes the roles and value of peer support personnel by offering best practice guidelines for the training and retention of peers in the support role (2013a). Within an education framework, peers teaching peers is most often more relevant and experiential than training offered by external educators and curriculum (Money et al., 2011). Peer support is accessible and trusted, and brings experiential knowledge and social support which in turn increases confidence in both peers and training recipients (Money et al.), all of which are associated with higher resilience (see for example: Masten & Narayan, 2012). These are all aspects of peer support which are endorsed by TBFRS.

Another example of collaborative, connected, relational, and adaptive leadership in TBFRS is in the 'flexible hierarchy'. Despite the historical hierarchal structure of the FRS, participants found ways to be innovative (i.e. with new training techniques, with developing a CISM program, etc.), engaged with the FRS and the community (volunteerism, providing service), and to thrive in the constantly changing environment of the FRS ('makes me a better person'). This type of leadership is more closely aligned with *complexity leadership* which is described as: interactive and adaptable with emergent change, and an organization with 'generative' or informal leadership (from the ground up) that responds to the day-to-day

challenges within a changing organization. Adaptive leaders respond to the complexity of the FRS by creating conditions that enhance organizational performance and simultaneously that allow the organization to transform or change in order to traverse the rapidly changing landscape of the modern FRS as well to seamlessly fulfil the existing day-to-day requirements of the job (Uhl-Bien, 2012).

Complexity leadership relates back to the previous section that overviewed *complex adaptive systems* (CAS) and more will be said about this in section 9.5.b; complexity leadership and CAS are founded in complexity science and as noted integrate and relate core concepts to one another as I am finding with developing a theory of resilience – the construct cannot be reduced to a sum of its parts, and is as complex and messy as any 'system'. Complexity science offers a possible framework for studying resilience in volunteer firefighters and while an extensive review of complex systems theory is beyond the scope of this thesis, I believe a consideration of complexity science may catalyse resilience discourse to greater depth and breadth. I am keen to see if leadership as a category of resilience translates across other FRS, emergency services, and other organizations; I suspect that it will falter and become less influential in organizations with traditional leadership that is not open to collaboration and the transformation that is required for a successful modern FRS. It also may be that traditional leadership has a negative influence on individual and organisational resilience; these are priority questions for future research. Certainly within a CAS model, leadership is a key component that focuses on building relationships, meaning-making, learning, innovation, etc. which are all components of resilience; once again the inter-relationships between the categories of resilience and resilience as a whole are highlighted through the lens of CAS.

8.6.c   Summary Of Category 5 – Leadership

Leadership as a category of resilience was a surprising finding in the research with volunteer firefighters, yet relates to literature on developmental resilience such as the need for adult role models to build resilience in disadvantaged youth (Masten, 2001); as well the literature on the social ecology of resilience consistently finds that structure and nurture from community members, parents, etc. build resilience in youth and communities (see for example: Panter-Brick, 2014). There is some literature (see for example: Maulding et al.,

2013) linking resilience to transformational leadership and leadership qualities such as emotional intelligence; this in turn adds to the findings in this thesis related to emotional expression and positive emotions as personal resources contributing to resilience. There are significant gaps in the literature about leadership and how it is understood in relation to resilience, and gaps in understanding leadership overall.

This programme of study finds the traditional leadership models do not serve resilience well in the context of volunteer firefighters, and this thesis provided examples from firefighters of leadership that is in keeping with complexity leadership and acts as a core category of resilience. Leadership aids resilience in its capacity to mentor and support one another, sharing knowledge, experience, and skills such as personal resources; leadership qualities such as emotional maturity and flexibility are found in all aspects of the organization. *Leadership* became visible in the data in relation to research questions 1.5 and 1.6 - what are the core concepts of resilience and how do those core components relate to one another?

Leadership as a category of resilience intersects with other categories such as: social support individually and organizationally (offering friendship/support, ensuring there are resources available within the organization to assist following PTEs); personal resources (supporting teamwork, verbal ventilation, and humour); culture (supporting the values of the organization); and knowledge (ongoing education on health, health promotion, stress reactions and coping). Leadership can be formal or informal, and is frequently found in the peer network of mentoring, educating, and supporting volunteer firefighters by complementing other resilience categories. The next section will discuss the sixth category – knowledge - that emerged from the data.

8.7.a   Category 6 - Knowledge

This category provided yet another surprise but when thinking about it, makes common sense and is also common within the extant literature: knowledge, as information gained and information shared, is a mediator for distress and contributor to resilience. For example, studies on childhood resilience find that education capacity such as functioning schools, school routines, etc. decrease levels of distress for children in conflict zones and disadvantaged families (see for example: Masten, 2015; Ungar, 2011), and disaster literature

demonstrates that providing information to meet basic needs for shelter, finances, and reconnection with family can mediate helplessness, provide a sense of control, and build resilience (see for example: Bonanno, Galea, et al., 2007). However knowledge/information has not been fore-fronted in other models or theories about resilience. For firefighters, there is opportunity for learning in every situation and with everyone's reactions and coping; knowledge can be used to better prevent and intervene in emergencies, and provides the platform for safe competent work, hence knowledge brokering is a key concept in the theory of resilience in the FRS.

There are a number of manifestations of 'knowledge' but the concept is summarized by Frankie as knowledge about safe practices:

> *It's all about safety - everybody goes home (Frankie).*

Knowledge is advanced through both formal and informal learning; the idea of lifelong learning relates to resilience in that:

> *Talking about/offering resources to help people when we go to a call (Shawn)*

> *I'm interested in learning things; learning then having the confidence to 'do it'; makes me sweat but makes me a better firefighter and overall a better person [because] I am out of my comfort zone at first…then just competent in a bunch of new skills that can only benefit me and the community (Bobbie)*

> *More education is always necessary/useful; the more info you have the more resilient you will be because the more options you are aware of. (Shawn)*

> *It's ongoing – we're always learning and developing skills and competencies for firefighting, first responder, and 'life' (Chris)*

Sharing knowledge contributes to collective resilience through education (knowledge enhancement) of others, and to individual resilience through knowledge enhancement, leadership, and service to colleagues:

> *Mentoring – protecting the young guys/gals from some of what we do – keep them back a ways at first, talk to them about what they might see/hear, but don't expose them to it right away. Allow them to see how others handle it, build resilience so that they have some tools for some of the bad stuff (Jamie)*

It is evident from these extracts that firefighters know that learning is ongoing and that increased knowledge contributes to resilience by building confidence, competence, and capacity; all have been associated in the literature with resilience (see for example: Rutter, 2012).

A common theme in several categories (personal resources, social support, leadership, and knowledge) is the idea of developing 'better, more well-rounded' people – not only to benefit the FRS and the community from the perspective of safety and competence, but from the personal realization that the competencies acquired in the FRS are transferrable across a wide array of personal and professional contexts:

> *Learning to work effectively on a team, with people that may or may not share the same interests as you, but to whom you are bound by the shared values of commitment and service (Max)*

> *Learning really applicable stuff – fire safety for the home and business, first aid/basic medical skills, finding your way around this beautiful community, seeing how lucky we are to live here, learning how to communicate effectively in times of stress (big one for my house!), all sorts of things that I never thought about when I came in… it's exciting (Andy)*

Learning self-awareness as well as 'other' awareness – how other people

learn and cope, and recognizing that we don't all have to get along, but

we need to figure out ways to work together (Sam)

There was talk of specific knowledge that is helpful to the FRS (firefighting skills, rescue techniques) as well as learning about people (i.e. the human stress response, 'normal & expected' stress reactions, common coping strategies, timelines for feeling decreased distress, etc.) all of which aids when interacting with people in distress:

The better you are dealing with people, the more resilient you are

because you see lots of different ways of coping – some good, some not

so good – and you learn what might/might not work for you – it's just

adding more to the toolbox (Chris)

This is another insightful perspective that shows the multidimensionality and interactive nature of resilience in volunteer firefighters.

There was a recognition that not everyone learns the same way hence the need to be respectful and responsive to a variety of ways of learning and knowing (see section 5.2.a):

This was a revelation to me – all about learning styles – & the FRS

appeals to all styles: written, verbal, trying it; see it done, hear

explanation, try it, reflect on it then do it again. This builds resilience

because you're willing to try new things including personal things like

exercise, yoga… (Frankie)

Learning practical stuff with theory behind it; emergency services started

excelling at this – makes me more confident and more willing to learn –

that makes me more resilient [because] I know more, I have more tools

to draw from (Andy)

These excerpts also showcase the relationships between the category of knowledge and the

categories of culture, meaning-making, personal resources, and relationships.

8.7.b   Discussion Of Findings About Category 6 - Knowledge

In order to understand knowledge as a core category of resilience, it is necessary to move beyond understanding knowledge as intellect or level of education, and to view knowledge in much broader contexts. Drucker (1999) recognized that knowledge is a resource and employed the term "knowledge worker" (p. 19) to describe those who develop and use knowledge; he further suggested that as we move through the 21st century, all workers are knowledge workers since we are all on a path of continuous learning in a rapidly changing complex world. Knowledge is a resource and a dynamic and situated process (Cote & Nightingale, 2012) within the FRS; for example, firefighters engage individually and collectively to produce complex products – fire suppression and medical first responder experts, fire safety technicians, and fire prevention educators. Knowledge workers need two things – education (general and specific) that provides entry into the FRS and, ongoing continuous education to keep their knowledge up to date. Knowledge changes rapidly and conversely becomes quickly outdated hence the need for ongoing education; knowledge is not hierarchal, but is equalized and shared. Knowledge contributes to resilience (see for example Almedom et al., 2010; McAllister & McKinnon, 2009; Schiraldi et al., 2010; Seligman et al., 2009) and resilience can be learned. The firefighters in this study endorse 'basic' and ongoing education in firefighting and medical aid, fire prevention, fire behaviour, etc. as well as education about workplace stressors, the human stress response, coping mechanisms, mental health, mental illness, and resources outside of the fire service that can be accessed for information and support; they also want this information to be available to their families and new recruits. Being forearmed is a key feature of resilience and ongoing information is critical to maintaining currency in our rapidly changing understanding of health and resilience. TBFRS members are adamant that attending to the psychological learning needs of firefighters is as important as other aspects of FRS training; this view is supported in the literature (see for example: Cote & Nightingale, 2012) about knowledge workers and is critical to ensuring firefighters are as prepared as possible in the rapidly changing world of firefighting.

TBFRS also recognize that education and knowledge translation must take into account the

variety of learning theories that represent adult learners. They are calling for 'good teaching techniques' inclusive of theory, practice, reflection, and further practice and recognize that learning is not rote but is thoughtful, discursive and solutions-focused. As with much of the literature on adult learning (see for example: Benner et al., 2010), firefighters recognize the need for multiple avenues of education and evaluation to demonstrate understanding of concepts and competence at integrating those into practice. Mezirow (2006) defines this as transformative learning, a complex process of multiple phases that leads to a fundamental shift in how people experience, interpret, and relate and act in their worlds. Over the years, Mezirow expanded his theory to include four types of learning: elaborating existing frames of reference; learning new frames of reference; transforming habits of mind; and transforming points of view (Kitchenham, 2009). This framework for describing adult learning is reflected in the voices of firefighters who talk about learning best practices of firefighting such as 'learning the latest techniques', adding new knowledge by 'keeping up with changes' (about medical response, fire behaviour, equipment, etc.), 'thinking differently in order to do things better' as transformational thinking, and 'learning from the bad calls' in order to transform points of view. In relation to resilience, firefighters are engaged in transformational learning through their participation in this research – giving voice to how they define and experience resilience in order to transform our understanding of the construct.

My own frame of reference is nursing, and the profound changes that have transformed nursing practice (electronic health records, nature and settings of health care, expanded role of nurses to name a few) have necessitated a change in how nurses are educated (Benner et al., 2010). Rather than learning rote skills as has been the case in past eras, nurses now must be able to clinically reason (which includes but is not limited to critical thinking) and must be prepared to practice safely and competently in the rapidly changing landscape that is human health/illness. The requirements for "technical-scientific and relational work" (Benner et al., p. 2) and the suboptimal conditions for performing such work are similar to the experiences of firefighters in their rapidly changing work environment. Just as we must find new and effective means to educate nurses, so must those who teach firefighters find ways to meet the requirements for technical theory and practices; above all, firefighters are saying there must be more integration of the 'human' side of firefighting (such as peer support, mental

health first aid, and basic psychological first aid for victims) as firefighters find themselves more frequently confronted with human suffering well beyond the old role of putting 'white stuff on red stuff'.

8.7.c   Summary Of Category 6 - Knowledge

The category of *knowledge* emerged from questions 1.3 related to coping with PTEs (i.e. the need for knowledge to improve performance or prevent PTEs from occurring) and 1.6 (i.e. acquiring and using knowledge enhances resilience through better preparedness and through the easing of distress by 'knowing we did the best we could' in adverse situations). Overall, having and/or acquiring knowledge is seen as an asset to aid not only the work of the FRS but also to enhance personal and organizational resilience; the more knowledge one accrues, the more likely it is that a solution can be found when faced with challenges on the fire/rescue scene and also in one's interpersonal and professional experiences. These perspectives are in keeping with common understandings around teaching and learning, particularly with adult learners (see for example: Benner et al., 2010; Drucker, 2005; Mezirow, 2006), and align with literature linking resilience and knowledge (see for example: Bonanno et al., 2007; Kitchenham, 2008; McAllister & McKinnon, 2009). One of the challenges in seeing knowledge as a key category of resilience, particularly in hierarchal organizations, is that knowledge transforms and empowers and is antithetical to traditional power-over organizations (Kitchenham, 2008); transformational learning requires questioning the utility and at times the veracity of ways-of-being and knowing within organizations (Mezirow, 2006), a practice that is not valued and even silenced in less evolved organizational cultures (Friere, 1970) including some FRS (see for example: Robinson-Kitt, 2009). However it seems unlikely that the FRS can avoid change and evolution; it is key to adaptation that, as noted in section 2.7.a in relation to the human stress response, knowledge and effective practices are shared – whether the knowledge relates to operational changes within the FRS or whether it relates to health and resilience. Knowledge translation equips firefighters individually and organisationally to address the challenges inherent in the job as articulated by the firefighters in this programme of study. The core category of knowledge directly links with the other categories by virtue of the need for knowledge in each of those categories; knowledge and resilience are in turn enriched by the inter-relationships between and among the categories. For example, knowledge increases

understanding of relationships as more than simply social support – there are negotiations, intentions, and communications that enhance social support to become more relational. As well, the category of relationships supplements knowledge about social support by adding depth and breadth that is otherwise unknown or assumed and not utilized.

This section of the thesis argues that knowledge is a key category of resilience as elicited by research questions 1.3, 1.5, and 1.6, hence contributing to a new understanding of resilience in the FRS. The next section will discuss the concept of 'service', a term that arose from the data in relation to research questions 1.3 (how do you cope with PTEs) and 1.4 (how do you define resilience).

8.8   SERVICE

Service is evident in all of the categories of resilience, and is consistently described by firefighters as a key feature of their experience, motivation, and way-of-being; it seems from this research that 'service' contributes to resilience by virtue of its relationships to all of the categories. Service transcends relationships/social support; it is a part of personal and professional relationships yet is an individual value that one brings or develops with the FRS.

> *Knowing I'm providing a service to my community – that bonds us*
> *together – that shared value…the social cohesion that service offers*
> *(Max)*

Service is seen as a personal resource that contributes to resilience:

> *It [service] is a common value in this FRS – it is something that I ascribe*
> *to…part of who I am as a firefighter and a person, and allows me to keep*
> *going despite bad calls (Chris)*

In this case, service aids in building resilience. As well, although closely linked to meaning-making, service is articulated as both the process of making meaning, and the meaning made – for example, being of service to the community can be the process of making sense of events, and providing service is the meaning that is made:

We did the best job we could in the service to our community – it was

just a really bad call but we still served (Shawn).

Service surfaced as a facet of culture and of leadership. Within culture:

Our culture is all about service – to our community, to individuals in the

community; if you don't believe in service, you probably won't join the

volunteer FRS – there's no money in it ☺ (Bobbie)

It's about selflessness and support to one another in the service of our

community (Jamie)

Leadership qualities such as selflessness and giving back are reflected in the exploration of service, and both of those are aligned with resilience:

Providing a service to someone else, thinking of others besides yourself

and your problems help build resilience (Jamie)

Service is selflessness, stepping outside of yourself to serve others

without thought of glory or gain (Sam)

Although selflessness emerged as an aspect of service it was tempered by a pragmatic recognition of the limits of selflessness and the need to balance selflessness with self-care and the care and nurture of one's relationships with spouse, children, friends, colleagues. Future research could explore whether it is this pragmatic self-care that creates dis-ease with the concepts of heroism and selflessness.

Interestingly, service was evident in the category of knowledge in the context of:

Teaching others [junior members] about service – it's not about the

paycheck but you really need to model and explain that to them – they

don't always see themselves as being in service (Frankie)

Excelling as a firefighter, no matter whether it's fire response, medical aid, training, it's all about service – you can't excel if you don't care about your community, if you don't want to serve your community – it makes you a better person and better able to face adversity (Andy)

The concept of 'service' arose repeatedly in the interviews, prompting the questions in subsequent interviews: is service a category of resilience – does service give rise to resilience? Or is service an individual and/or collective value that is nurtured within the context of the volunteer fire service and inherent within the concept of resilience? If one does not ascribe to a service value as a volunteer firefighter, is one less resilient than those who do recognize service as an inherent aspect of a volunteer FRS?

However, attempts to further explore service in the broader context of resilience did not clarify the concept. I asked open-ended question but no substantial accounting occurred and I felt that I was forcing the conversation and forcing the data; in retrospect, the conversations stalled until I moved on to concepts that were more meaningful to firefighters' understanding of resilience: relationships, personal resources, meaning-making, culture, leadership and knowledge. Throughout the conversations, the definition of service and its role in resilience remained conceptually hazy, and although the term was commonly and frequently used, it was always in the context of one of the core categories. Any attempts to further explore service in subsequent interviews again seemed that I was forcing conclusions as opposed to allowing the categories to emerge organically. The data was not robust enough to conclude that service is a core category of resilience; however service is evident within the six categories that frame the theory of resilience in volunteer firefighters.

Intuitively I believe that service to others contributes to resilience but there is no data in this CGT to support my intuitive knowledge and attempts to explore the concept led to a rabbit hole of conceptual confusion. Resilience has been correlated to mental health (see for example: Southwick et al., 2011), and mental health is associated with beneficence and community service in paid professional firefighters (Wagner et al., 2010). There is evidence that correlates altruism with resilience (see for example: Seligman, 2002) and associates

volunteerism with mental well-being (Tabassum et al., 2016), and it is clear that firefighters take pride from their service and hence feel a sense of competence and confidence in serving their community. However, even though service is a concept that emerged from the data in relation to questions about coping and the definitions of resilience and the term *service* arose in all categories of resilience in volunteer firefighters, there is no consistency in the meaning or role of service in resilience. Within this programme of study, there is not enough data specific to service to demonstrate it as a stand-alone category in this substantive theory of resilience; since there is a dearth of literature overall relating service to resilience, its potential fit and the nature of this fit are areas for future research.

8.9 CONSTRUCTION OF THE GROUNDED THEORY OF RESILIENCE IN VOLUNTEER FIREFIGHTERS

8.9.a Theory Construction

Describing how the theory of resilience was constructed is important in order to clearly ground my representation of the theory of resilience to the data and findings from the research. Also, because of the complexity of the construct, it is challenging but necessary to highlight specific aspects yet not reduce the theory or break it down to become 'parts' of the theory rather than the whole. The description of the process of theory construction, as well as a visual representation is presented next.

Theory can be defined as a statement "of relationships between abstract concepts and may aim for either explanation or understanding" (Thornberg & Charmaz, 2012, p. 41). This contrasts with *model* which is the representation of the explanation or theory. Ultimately, proposing theory is the practice resulting from research (Charmaz, 2008) in which theories attempt to answer questions, account for situations and how they develop, and may account for 'why' the situation occurred. Theorizing results from pausing, contemplating, and thinking anew (Charmaz, 2014, p. 244), and in this research, began early in the concurrent data collection and analysis as I looked at prospects, established connections and asked questions, and ultimately moved beyond description of data to in-depth analysis of processes and the explication of actions. A CGT moves beyond the individual's experience but reflects the individual perspectives; the theory may be used as "a lens to interpret

people's experience or to direct actions and interventions" (Wuest, 2012, p. 247) as happened in this research; I/this thesis was a vehicle for the expressions of resilience by volunteer firefighters. The process of data analysis was inductive (data-driven) and deductive (interpretation and abstraction), and included coding, memo'ing, theoretical sampling, etc. as described in Chapter 6. Theory was generated in response to the data, coding, and reflexivity throughout the process of analysis as I came to 'know' the data (Mills, Bonner, & Francis, 2006b, p. 4); the product or outcome of analysis is the theory (Charmaz, p. 245).

8.9.b   Emergence Of Core Categories And The Constructed Theory

The core categories emerged from the data collection and analysis of over 45 hours of interviews with each of the eight participants from within the FRS and two external participants; the concurrent data collection and data analysis were described in sections 6.2, 6.3, and 6.4, and are represented in Appendix VII as a mind-map. The categories that emerged from the data indicate that many physical and psychological factors inter-relate on multiple levels and across various contexts to create and maintain resilience in volunteer firefighters who face a variety of stressors in their roles as firefighter and/or first responder; the complexity of the theory was challenging to understand both in my head, and in writing.

The limitations of a linear model are evident in Table 4 at the beginning of this chapter; the relationships between and among the categories are not revealed and visualizing them is not easy. Therefore, a visual model was created, initially with computer graphics – however, my blundering artistic renderings and lack of familiarity with computer graphics created more confusion than clarity. Eventually I came upon the Meffert's 'gear ball' (Meffert, n.d.), an advanced Rubik's-type puzzle, that surprisingly was a simple yet effective representation of the theory of resilience in volunteer firefighters emerging from the analysis. This six-sided, six-coloured puzzle has multiple movable parts and successfully represents the dynamic interactive theoretical categories of resilience and the flexibility of the construct. I also developed a Venn diagram (Appendix VIII) and a concept map (Figure 4) to aid in visualization of the theory.

The reality of CGT is that the constructed theory is an interpretation by the researcher. It is

imperative that the theoretical rendering be subjected to critique by participants and by a broader audience. In this case, the theory and the representative model were reviewed with participating firefighters, and although I expected I would have to adapt the theory, each firefighter concurred with the theory and reinforced the use of a model to represent it. The theory was then offered for critique and discussion to a firefighter from another volunteer FRS who had initially served as one of the external interviewees who piloted the interview schedule; the process provided *theory triangulation,* as well as allowed critique and fine-tuning of the theory. Also, my critical friend (see section 6.2.b this thesis) provided opportunity to see if the theory 'makes sense' and further extended the theory outside the context of the FRS. Also, over the past few months, I have presented the theory to mixed audiences of academics and emergency services personnel (see Appendix IX) and requested feedback about whether it makes sense and if it may be relevant beyond the FRS. Overall the gear ball is an excellent tool for demonstrating the dynamic configurations of resilience; it provides the multi-dimensional perspective in real time and adds to the depth of understanding of the complexity of resilience. Audience members at several presentations have said engaging with the gear ball provides their 'aha' moments about the depth and breadth of the construct. A more systematic process was also used to seek feedback on the theory; this process and the outcomes are described in section 8.14 (Relevance and utility of the CGT).

8.10   THE CONSTRUCTED THEORY OF RESILIENCE IN VOLUNTEER FIREFIGHTERS

Figure 4 represents the substantive grounded theory that was co-constructed between and among myself and the firefighters.

Key to Figure 4

Categories (relationships, personal resources, making meaning, culture, leadership, and knowledge) are highlighted in different colours; some of the
Sub-categories are shown as nodes linked to each category with uni-directional lines.
Inter-relationships between each of the categories are represented through bi-directional coloured lines.
The complexity of the theory is somewhat evident by this rendering, but is much more evident through use of the gear-ball.

FIGURE 4: THE CONSTRUCTIVIST GROUNDED THEORY OF RESILIENCE IN VOLUNTEER FIREFIGHTERS

Resilience - a system of alternative pathways through adversity or potential trauma; a multidimensional, multileveled, dynamic, and transformative health construct

Knowledge
- Acquiring knowledge formally & informally
- "Lifelong learning"
- Developing skills & competencies for firefighters, first responders, "life"
- Developing "better, more rounded people"
- Having self-awareness as well as 'other' awareness

Leadership
- Leading by example
- Backing people up
- Being fair, competent
- Formal & Informal
- Adapting

Culture
- "Family"
- Supporting
- Serving
- Connecting to community
- Understanding

Relationships
- Crew
- Spouse/family — "My" family — takes priority / Firefighter 'family'
- Friends
- CISM Peer support team
- Relationship with community (service)

Personal resources
- Physical — Exercise, working out / Laughter, smiling
- Mental/emotional — Yoga, self-reflection, mindfulness / Positive emotions
- Attitude — Positive, optimistic, grounded, hope
- Values — Service, commitment, integrity, caring

Making meaning
- Engaging in reflection
- CISM
- Having faith
- Making sense of events/outcomes
- "Knowing I did the very best I could"

Resilience

8.11 INTERACTIONS BETWEEN CORE CATEGORIES

The bi-directional lines on Figure 4 represent the interactions and relationships between categories and sub-categories, the 'temporality' of the theory. As can be seen, one category does not exist on its own but the theory is more than the sum of the categories. As the theory was emerging, the interviews allowed me to scrutinize categories and connections, and to clarify those with participants; the theory was co-constructed through this back-&-forth process between myself, the data, and the participants.

Once constructed the CGT needed to go back to the participants for critique and confirmation, and was presented in a draft form to firefighters in the third interview; interview questions were generally specific to the theory overall (see Appendix V – 3rd interview). I used the Venn diagram (attached as Appendix VIII), the concept map (above) and the Gearball as visual tools; participants tended to prefer one model over another:

> *I really like [the Venn] – firefighters like simple colourful graphics*
> *(Frankie)*

> *I like [the concept map] with all the arrows – it helps me see how all the*
> *categories overlap and relate to one another – you can't have resilience*
> *with at least some component of each category (Jamie)*

Reactions and feedback to the theory were supportive and validated the theory in its format and relevance to volunteer firefighters.

> *This is exactly how I see resilience now – big, messy, complex – this is*
> *great! (Andy)*

> *This has a lot of face validity...other models don't capture enough of the*
> *variance [that is human beings]; they try to get people to fit into them –*
> *it's easier to explain but real people, real experiences know resilience is*
> *not linear (Taylor)*

*I see how relationships obviously relate to personal meaning and to
meaning-making – I know that already but it helps me to see for
example that without knowledge we could not 'use' relationships,
personal meaning effectively (Danny)*

*Knowing about the categories lets me try to boost some or all of them
pre-incident or to focus on one or more after a bad call (Shawn)*

*When you work with people, this is how they are – they are not linear,
they are messy, their lives are messy, but this [theory] is very real to the
people on the ground – it makes total sense when you begin to think
about how human beings actually behave (Taylor)*

When describing the relationships between categories, the firefighters had varying opinions
as to the importance of one category over another:

*Without knowledge we wouldn't know about the other categories and
might feel less resilient so knowledge is the key (Frankie)*

*[they are] symbiotic…all categories relate to one another, one is not
more important than another (Andy)*

*The parts are important and give us some place to 'land' within this very
complex model, but it is the connections that give resilience its strength
and dynamism (Bobbie)*

When asked about the strengths of the theory, comments reflected an appreciation for the
complexity of the theory:

> *It's a web, and the strength is in the interconnections, how all the*
> *strands tie together…the categories are almost unnecessary (except to*
> *help visualize the model), it is the interconnections and*
> *relationships…that hold the strength of the model and of resilience*
> *(Chris)*

Another strength was noted to be:

> *Simply the research itself – normally volunteer firefighters don't get the*
> *level of support/interest that other emergency and military services get.*
> *The fact that someone is coming in and looking at this population in-&-of*
> *itself is a strength. The fact that we're now beginning to look, in a more*
> *sophisticated manner, in the wellbeing of the people who provide this*
> *service is a strength (Taylor)*

Other strengths of the theory are in its representation of the interactions that offer multiple
pathways and multiple dimensions of those interactional pathways, and in its dynamism and
flexibility that represent the dynamism and flexibility of resilience in volunteer firefighters.

> *[The] categories are ways to discriminate parts of resilience, but it is the*
> *web/connections itself that is the resilience…the internal & external*
> *connections [on gearball] are not separate discreet pieces/concepts, but*
> *work together. The connections really are the resilience (Taylor)*

> *I can sure see how resilience looks/feels different from one firefighter to*
> *another [adjusting the gearball] but how there are common aspects*
> *within each of us (Andy)*

…the shared value (individual and departmental) of service will

continue…that's why we join the FRS…the shared value will strengthen

the culture [in the face of adversity, change]…we know what is right,

what is just, and what we need to do to serve our community – it's what

connects us (Chris)

This representation of resilience is likened to brain plasticity:

It's like the brain - when one part is damaged or lacking, other parts

become stronger, grow new connections (this is not a static model) so

the same things happen here as you can see with the gearball (Chris)

When asked about limitations of the theory, firefighters had little to suggest as limitations or areas for improvement other than:

It's really complex and we've typically tried to make something very

complex into something very simple – this model is evidence that we

cannot do that – but I doubt everyone will agree with this [definition and

theory] (Jamie)

It will be interesting to see [if] leadership styles change…how the culture,

relationships, and how we make meaning of being a firefighter

changes/adapts – will those other parts come more to the fore…or will

the department become less resilient by having one part chip away at

the others? (Chris)

However, Taylor, thinking of the theory in a broader context notes a significant challenge will be in gaining 'buy-in':

The biggest limitation you face is buy-in - look at CISM & the years it has taken to integrate the recognition that bad things happen yet there are healthy ways to take the edge off the stress of the job…buy-in is challenging – people are resistant to change so bring in change knowledge/theory to implement this – know the culture, build trust, do change slowly (Taylor)

In summary, the CGT reflects firefighters' experiences and perspectives of resilience as an interactional construct, and is consistent with the literature about the interactional aspects of resilience (see for example: Bonanno, 2012; Masten, 2014) and multiple pathways and trajectories to resilience.

The findings also show that volunteer firefighters have different 'highlights' or foci when defining resilience, which is reflected in the multi-dimensionality of the theory. Firefighter resilience differs from one firefighter to the next; this rich diversity of definition and experience is reflected in the literature (see for example: Mancini & Bonanno, 2009) but some combination of the six categories and/or sub-categories is present for each participant. The multidimensionality and interactivity of the theory bespeak the complexity of the construct which is in contrast to other models of resilience (see for example: Luthar, 1993; Rutter, 1987).

8.12   THE CONVERGENCE AND DIVERSITY OF THE RESILIENCE THEORY TO CURRENT MODELS

There are a number of existing models of resilience that are enhanced by this theory. Three were introduced in the literature review (chapter 3.3.k, 3.3.l and 3.3.m) and will be further discussed in the context of the constructed theory and firefighters; the rationale for focusing on these models is that each has close affinity to the context of the FRS.

8.12.a Bonanno

As noted in section 3.3.k of this thesis, it is nigh impossible to reduce Bonanno's prodigious array of research findings to a few short paragraphs; his teams have researched resilience in

people experiencing disaster (9/11; Hurricane Sandy), conflict (Kurds in the midst of war), bereavement (men and women bereaved of spouses and children), epidemics (SARS outbreak in Hong Kong), all ages, nationalities, and gender, short-term and longitudinal studies. Bonanno's findings contribute multiple contextual and temporal insights into resilience (see for example: Bonanno, 2012; Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Mancini & Bonanno, 2009). Bonanno and colleagues have found: resilience is the core experience of people exposed to PTEs and chronic adversity; resilience is common; heterogeneity of responses to PTEs is the norm; personal interpretation of events as traumatic or not are influenced by resilience; resilience is a umbrella phenomenon comprised of temporally related elements; there are trajectories to resilience; flexibility in emotional response and choice of resources influence the trajectory; and resilience is an outcome. There are parallels to Bonanno's findings in this thesis; in response to the research questions, volunteer firefighters note: PTEs are common in their line of work; there are a variety of responses to PTEs as well as an array of flexible coping strategies; and firefighters see resilience as the common process (trajectory) and outcome.

Bonanno, Romero, and Klein (2015) articulated a model of resilience consisting of four temporal elements that can be applied to individuals or communities (families, workgroups, other groups such as geographic communities, etc.). The four elements are (p. 140): baseline or pre-event functioning; the events themselves; post-event resilient outcomes referenced against both baseline and the event; and predictors of resilience outcomes measured prior to, during, and after the event. Ultimately this temporal framework leads to various resilience trajectories. One of the limitations to this model is that it is visually represented by linear components and it is difficult to consider the relationships between the components; for example, how do appraisal processes and social resources, two components of Bonanno et al.'s resilience trajectory, interact with one another to bolster resilience? This linearity is common to a number of models (see for example: de Terte et al., 2014), hence the incorporation of the 'gear ball' into this thesis. The gear ball provides a multi-dimensional dynamic model of resilience that allows visualization of all six categories of firefighter resilience and the various and dynamic interactions between them, offering context and visual temporality to the theory as discussed below.

The findings of this programme of study contribute to Bonanno's model of resilience by providing a new context (volunteer firefighters) and temporality (the dynamic inter-relationships between the categories and sub-categories). More specifically, the research questions directly relate to the temporal elements described by Bonanno et al. (2015): research question 1.1 offers the firefighters' perspectives of tough calls and defines the PTE's most commonly faced by firefighters; research question 1.2 elucidates the heterogeneity of responses to PTEs noting the adaptive nature of reactions and linking to pre-event functioning by firefighters' perceptions of pre- and post-event distress; research question 1.3 addresses post-event functioning by articulating the array and flexibility of coping strategies. The new definition of resilience (Chapter 7.5.c) and the theory of resilience with its six core categories inter-relating to one another can be considered predictors of resilience as per Bonanno's model but overall contribute significant new knowledge about resilience in volunteer firefighters. The design of the research questions as parallel to Bonanno's model was unintentional given that Bonanno et al. had not published their model when this programme of study was undertaken. However, the coincidence demonstrates the relevance of the volunteer firefighter context to resilience studies and this thesis further contributes to a broader conceptualization of resilience in that context.

8.12.b de Terte And Colleagues

De Terte et al. have established a three-part theory of resilience in police officers that comprises environment, behaviour, and cognition (de Terte, Stephens, & Huddleston, 2014). Within the three categories, social support, adaptive health practices, and adaptive coping were noted to be effective for police officers faced with adverse events; the model also notes bidirectional inter-relationships between the three categories. One of the limitations that I find with the model is the focus on individuals as opposed to considering external mediators of stress such as culture, leadership, and knowledge. This is one of the first multidimensional models offered to emergency service providers however there are limits to its applicability to firefighters: the focus on individual components limits its use for volunteer firefighters who work as a team, and the restriction to three categories is not supported by the theory of resilience in firefighters who experience resilience in more breadth and depth.

This thesis with firefighters however offers some additional dimensions to de Terte et al.'s model and may offer new insights into resilience in police officers if and when it can be tested in the police context.

8.12.c Fletcher And Sarkar

Fletcher and Sarkar (2012) provided an emerging model of resilience in high-performance athletes, a population that is similar to volunteer firefighters in its commitment, focus, motivation, etc. Their model finds multiple psychological factors such as social support, positive personality, focus, motivation, and confidence mediate potential negative effect of stressors by influencing how athletes interpret and respond to stressors, providing "facilitative responses" (p. 669) that aids sport performance.

Fletcher and Sarkar's grounded theory of psychological resilience has many parallels to my research in that it studies resilience as a construct requiring a stressful event but also sees resilience as a multidimensional adaptive process. The limitations with the Fletcher and Sarkar model in the firefighter context are, again, in its focus on the individual and internal qualities such as motivation, positive personality, and cognitive appraisal; social support is a category and process within Fletcher and Sarkar's model but the model is more closely aligned with models of state/trait. Fletcher and Sarkar do acknowledge the interactional components within psychological components and suggest further research to match context such as environment with psychological components of resilience. Although the theory of resilience in volunteer firefighters is not explicit about psychological factors, firefighters do identify hope, optimism, attitude, etc. as sub-categories of personal resources, and it is the interactions amongst the various categories that provide the model's depth and breadth; it would be useful to explore culture, knowledge, and leadership in the form of role models and coaches to see how these contribute to resilience in high performance athletes.

8.12.d Summary Of Alignment Of Models To The CGT Of Resilience In Firefighters

These are three models that I find relate most closely to the current research and the volunteer firefighters' context, and to which this theory of resilience contributes original

context and conceptualization hence new knowledge. The strengths and limitations of these models were discussed, and recommendations for future research in the firefighter context were offered. Another area of research will be to test this constructed theory of firefighter resilience in other contexts such as other emergency and non-emergency services to see how it translates and holds up.

8.13   ALIGNMENT OF EXISTING THEORIES TO THE CGT OF RESILIENCE IN FIREFIGHTERS

Reflecting back to Chapter 3 of this thesis, several theories emerged from the literature that informed the understanding of resilience at the time this research was undertaken: resilience is common (Bonanno, 2004) and 'ordinary' (Masten, 2001); resilience is conceptualized beyond psychopathology (see for example: Murphy, Durkin, & Joseph, 2011); and resilience is a salutogenic construct (Almedom, 2005; Antonovsky, 1996). Through this programme of research, our knowledge of resilience has been enriched by the alignment with other disciplines and theoretical frames including but not limited to organisational theory and positive organisational behaviour (see for example: Luthans et al., 2006; Wright & Quick, 2009; Youseff & Luthans, 2007), complexity leadership (Uhl-Bien, 2012), positive psychology (Joseph, 2015; Seligman & Csikszentmihalyi, 2000), health (McAllister & McKinnon, 2009; Mental Health Commission of Canada, 2013a) , and salutogenesis (Almedom, 2005; Antonovsky, 1996). These theories complement one another in the unique context of the volunteer FRS, and this is the first time they have been brought together under the construct of resilience. For example, Youseff and Luthans (2007) emphasize positive organisational behaviour (POB); the theoretical foundation for POB (having measurable outcomes, being open to change, and having an impact on worker performance) is reflected in firefighter perspectives of the resilience categories of relationships, culture, leadership, and knowledge. This CGT of firefighter resilience links POB and psychological capital (Youseff-Morgan & Luthans, 2015), positive emotions, and hope to resilience under the umbrella of positive psychology. These are not new concepts or theories but are emerging as equal to traditional theories about dysfunctional organizational behaviour; this programme of study provides support for positive organisational concepts and in turn is supported by these concepts as was evidenced by the data highlighting sub-categories of hope, optimism, and health. Contrast these perspectives with historical traditional research

into 'risk' factors which have found no enduring conceptual relationship to resilience (see for example: Garmezy & Masten, 1991) as noted in Chapter 3 in the descriptions of early definitions of resilience that focus on states, traits, and psychopathology (see for example: Garmezy, 1971; Richardson, 2002; Rutter, 1987).

It is only since Bonanno (2004) challenged the field to consider resilience as the norm that exploration has focused on the positive components of resilience. This positive orientation is reflected in the data of this research, and has enabled a broader view of resilience, particularly in the context of volunteer firefighters and in relation to the research questions about stress, coping, and resilience. This programme of study offers rich data on resilience categories especially culture, leadership, and knowledge that are key to unpacking resilience. Theoretical frameworks such as positive organisational behaviour in turn link to health inclusive of physical, mental, and social wellbeing (see for example: section 2.5.b and salutogenesis (see section 2.5.a), further supporting resilience theory construction in volunteer firefighters.

8.14   RELEVANCE AND UTILITY OF THE CGT OF RESILIENCE BEYOND THE VOLUNTEER FRS

CGT does not seek generalizability (Charmaz, 2014) but instead looks for a rich contextualized understanding of aspects of human experience. El Hussein et al. (2014) note however that knowledge evolves through confirmation and although not part of the aims of this research, it seemed important to seek evidence for this theory beyond the context of volunteer firefighters. Therefore a brief but systematic approach was undertaken to assess the credibility, resonance, and usefulness of the CGT; a series of short interviews were conducted with people outside the volunteer FRS to ascertain whether future formal testing of the theory beyond the volunteer FRS is warranted. This process and findings are described next.

8.14.a Process

In order to demonstrate that the CGT of resilience may have utility beyond the volunteer fire sector, a series of short (30-40 minutes) interviews were conducted with a sample of three career firefighters and two nurses. Participants were recruited from two FRS and two

nursing organizations in my geographical area and were selected based on those who asked 'how is your PhD coming along', usually in the context of meetings or other professional gatherings. I asked those curious professionals if they would be interested in providing feedback to the theory and subsequently set up mutually convenient times/locations in which to conduct the interviews. I chose the three firefighters and two nurses who came forward first. The firefighters were from two career services – two were in command roles and each have over 20 years' experience in the FRS, and one was a firefighter with three years career service. Nurses were selected since I am a nurse and am curious about how nurses see this model, and because they expressed interest in the concept; one is a nurse educator with 20 years' nursing experience, and one has three years' experience in acute mental health. In order to maintain anonymity and differentiate these participants from TBFRS, I named them as 'associates' (A) and assigned numbers (firefighters are identified as A1, A2, A3, and nurses as A4 and A5.

Since the interviews are integrated into this thesis, I asked participants for consent to conduct and record the interview and to incorporate the findings into the thesis. I used the consent form that had been approved for the original participants (see Appendix III) and explained that the focus of the interview was on the theory that had been developed but that I would answer any questions related to the overall research at the end of the interview.

These interviews differed from the intensive interviews of the research that sought to 'explore' firefighters' perspectives and were generally free-flowing and qualitative; in contrast, these interviews were investigatory (Charmaz, 2014), seeking specific information hence were more structured.

The interviews focused on four questions:

1. What are your thoughts/impressions about this theory of resilience in relation to the categories of resilience and the inter-relationships between the categories?
2. What are the strengths of this theory?
3. What are the limitations?
4. Describe how this theory might apply (or not) in your FRS/nursing unit.

8.14.b Findings

The reactions of the associates to the theory were similar to those of TBFRS, particularly in the recognition of the complexity of the construct:

Resilience is 'fluid', very dynamic, and looks different for each person –
this is not the usual one size fits all (A2)

This is very complex – but it really captures the complexity of resilience
even though I am looking for ways to simplify it ☺(A3)

It's very 'real' to me – you've captured all the nuances and connections
(A5)

[The analogy of the] -'web'…says it [and] it becomes more and more
dense as time goes on and more connections are made so there is less
reliance on a few connections and more on the density of the
connections (A4)

Overall, the categories and relationships among/between the categories were seen a relevant and useful to career firefighters and nurses. The associates were able to relate to the categories and recognized themselves and colleagues within the model. Importantly, and uniquely to this programme of study, the theory is seen as complete, complex, interconnected, and dynamic similarly to the perspectives espoused by TBFRS participants. Categories link to one another, overlap with one another, and grow/evolve over time. The findings from the associates offers further dimension, breadth and depth, to the theory allowing it to translate across contexts beyond the volunteer FRS.

When asked about the strengths of the model, associates further highlighted the complexity, relationships, and possibilities of the theory:

There are so many strengths for nurses in this theory – the power of diversity, the knowledge that I can/do influence the culture of my team or work unit, empowerment – I/we have choices (attitude, exercise, relationships, whether to work in this negative culture or not…) (A5)

[the strength] is in the reality of resilience as the most common outcome – moving from trauma being the expected outcome but now understand resilience is the most common outcome – we don't have to be traumatized…gives us other options…'why' some people are resilient is the next question (A3)

Categories are seen as core to the overall flexibility and dynamism of the theory. Associates also see that the theory offers another lens from which to view occupational risks, adversities, and outcomes not constrained by the illness paradigm but offering multiple entry points to health. Firefighters and nurses see the interactions between categories but also recognize the categories and sub-categories as 'start-points' into the web of resilience – creating, building, and maintaining health, and recognizing the role of resources such as attitudes and values.

From these excerpts, the strengths of the theory are seen as the meanings and opportunities ascribed to the theory – choice, empowerment, attitudes – which in turn can further influence the resilience of individuals and organizations, and its relevance across disciplines.

Limitations of the model were related to implementation and engagement:

Implementing this will need to be one firefighter at a time – each person, each watch culture, each station is different – addressing those individualities is key to change but will take time – it will be a long process. (A1)

Getting buy-in – getting this model to firefighters – it's a good model, it
will work for them but getting them to buy it – we are caught up in
denial, the inevitability of PTSD, in getting 'presumption' rather than
looking at what's working for us (A3)

These excerpts also reflect Taylor's perspective about 'buy-in' – corroborative viewpoints from disparate contexts about the struggle to conceptualize and operationalize resilience.

As well, these excerpts recognize the challenge inherent in battling the hegemony of the medical model, similarly again to Taylor (section 8.11); although there is stigma associated with mental illness (see for example: Mental Health Commission of Canada, 2013a), the prevailing paradigm of looking for illness to 'fix' generally trumps the firefighters' preference for a health paradigm (see for example: Blaney & Brunsden, 2015). However, this theory of resilience that is firmly grounded in health supports a shift towards health promotion, positive psychology, and a mindset that resilience is the most common outcome following adversity (Bonanno, 2004); this shift reflects changes in occupational health programs (see for example: Mental Health Commission of Canada, 2013a).

Additionally, associates commented on the role of service:

Service is not a motivator for career firefighters; even if it was part of
why we joined, it's goes by the wayside quickly (A2)

However, upon further exploration, this associate agreed that service is inherent to 'emergency services' but did not find the concept relevant to resilience, demonstrating the need for further investigation of the meaning and role of service.

Overall, associates found relevance and utility for the CGT of resilience in their contexts:

You've built a dynamic model that will allow us to examine [how people
are resilient] and put resources more appropriately into preventative as
well as reactive strategies (A2)

This is a very transformative and hopeful model for nurses...reflects the
core values of nursing that [we] lose sight of...a good reminder of their
importance in a broader scheme of resilience (A4)

Again, associates endorse the completeness of the theory with links to individual and organizational values apropos to resilience.

As well, a correlation to change within the FRS was found in the theory:

The role of leadership – the slowly evolving model of leadership in the
FRS – validates 'servant' and in this case 'complexity' leadership within
the FRS – ties it not just to management and change theory but health
practices – awesome! (A1)

This sanctioning of leadership, and complexity leadership in particular, as a category of resilience and as important to health, ties in with the idea of 'buy-in' in order to implement the theory in contexts beyond the volunteer FRS – the need to move beyond traditional hierarchal practices to organizational attitudes and leadership models that more accurately reflect the strengths and capacities of the FRS.

Associates offered strategies for implementation of the theory in career FRS and nursing:

There are so many 'entry points' for implementing this theory – you can't
really do it all at once but you (organizationally and individually) can
start with any of these categories or even the sub-categories and slowly
integrate (at all 'levels' of the FRS) each of these until you eventually
have all of them in place – then work on shoring up/building the
connections (A2)

Similarly to TBFRS participants, this associate suggests that bolstering one category at a time will also strengthen overall resilience; the categories are irrevocably linked (section 8.11) and focusing on one category allows resilience to be operationalized in manageable 'chunks' analogous to Hobfoll's concept of resource caravans (2014).

Another associate connected culture and positive psychology in their analysis of the theory:

> [This reinforces the] influence of culture, the overall philosophy of
> nursing resilience that needs to be strengthened so that we build up 'this
> is who we are, we are resilient' & you talk this vision up, build this
> belief/culture/ in terms of how people think about themselves and their
> profession which in turn will [lead to] greater resilience (A5)

This perspective further explicates the pertinence of this theory to health and positive psychology (which will be further discussed in section 9.4.b), and to contexts that highlight, but are not limited to, volunteer firefighters.

These excerpts are a small sample of the responses and insights that emerged from the interviews, and which provoke my intense interest in offering this theory in other contexts.

8.14.c Utility beyond the volunteer FRS

As noted in section 1.3 and 1.4 of the thesis, the aims of the programme of study intentionally focus on the construction of a theory of resilience in the under-represented population of volunteer firefighters because existing models of resilience do not easily translate to the firefighter context. The understanding and applicability of resilience theory across contexts as a 'one size fits all' approach has been strongly contested (see for example: Bonanno, 2012; Masten, 2015; Panter-Brick, 2014); however it is imperative to understand resilience not only in volunteer firefighters but in all high-risk professions. As demonstrated here, the TBFRS participants along with associates external to the volunteer sector affirm the theory as a complete and thorough representation of resilience. The CGT of resilience in

volunteer firefighters resonates with select career firefighters and nurses, and shows promise for utility in those sectors; the next step will be to formally test the theory in fire, nursing, police, paramedic, and other emergency contexts.

8.15   CHAPTER SUMMARY

This chapter presented a novel theory of resilience in volunteer firefighters that emerged from the data in response to the research questions, and reflects the aims and purpose of the research. The chapter unpacked the concept of resilience in response to research questions 1.5 and 1.6 and put the concept back together in the unique context of volunteer firefighters; as well interdisciplinary perspectives were offered to further support the findings. The core categories of social support, personal resources, meaning-making, culture, leadership, and knowledge as well as the interrelationships between the categories and subcategories were demonstrated and discussed.   A visual representation of the theory was offered in order to appreciate the construct as a complex systems paradigm. The theory was compared and contrasted with extant theories and models and contributions to the literature were overviewed. Potential utility of the theory in contexts other than the volunteer fire sector was discussed. The next chapter will showcase the contributions of the programme of study, and conclude with a summary of the findings and contributions of this distinctive theory of resilience in volunteer firefighters.

CHAPTER 9   ORIGINAL CONTRIBUTIONS AND CONCLUSIONS

9.1   OVERVIEW

Nowhere are the limitations of current clinical models of trauma

more evident than in the irrelevance to people's resilience…

Hobfoll, (2014, p. 27)

This chapter will focus on the original contributions of this programme of study. The concepts of originality and contributions have changed substantially from my thoughts when I first began this programme. Initially I anticipated that simply developing a theory of resilience would be reasonably straightforward and easy since I have spent a fair bit of my career nursing from this perspective; however, 'living' resilience is not the same as understanding and articulating it across multiple disciplines. I also thought that although I have worked with firefighters for many years, there is not much evidence of their voices in the literature hence the 'originality' piece of the thesis would be bringing their perspectives to the academic table. As I moved through the process however, those simplistic ideas of originality and contribution evolved considerably and I was humbled by the firefighters' in-depth and insightful perspectives of resilience. As a result, I now see that there are a number of significant contributions offered by the research: advancing the understanding of resilience in adult high-risk professions; evolving a unique and relevant definition of resilience, and construction of a multi-dimensional interactional theory of resilience in volunteer firefighters. The thesis also contributes to a broader conceptualization of resilience in the fields of complex adaptive systems, salutogenesis, and positive psychology. These will be articulated throughout this chapter, and mapped to the research questions of the thesis.

The chapter is structured around the aims and purpose of the programme of research since they are foundational to the findings; the chapter also overviews the study limitations. As well this chapter will provide synthesis and integration of the findings and discussions from chapter seven, and will discuss implications for theory and application (as discussed in chapter eight). The thesis will conclude with a summary of the original contributions of this

programme of study.

9.2   SUMMARY OF PURPOSE AND AIMS

The overall purpose of the programme of study was to construct a theory of resilience in the context of volunteer firefighters. The aims were: to explore the stressors, stress reactions, and coping of volunteer firefighters in order to situate the study in the context of work-related stress; to define resilience in the context of volunteer firefighters and compare/contrast with existing definitions; and to construct a theory of resilience in the FRS. The purpose and aims were achieved through constructivist grounded theory methods and the emergent theory revolutionizes how we understand resilience. The theory provides new knowledge about the construct of resilience and is founded in new knowledge about how firefighters experience and cope with work-related stressors, and in their understanding of the role of resilience in maintaining firefighter mental health.

9.3   REVIEW OF FINDINGS

This programme of research provided deeper insights into the stressors faced by volunteer firefighters particularly the 'tough' calls but also aspects such as the need for negotiating time away from their families in service to their communities. The findings offer better understanding of the reactions volunteer firefighters experience as a result of their service, and how they contextualize those reactions as 'normal and expected', situating their reactions in a paradigm of health. As well, the thesis surfaced the coping processes of firefighters as generally healthy and adaptive, which align with concepts of positive psychology such as strengths and capacities. The definition of resilience evolved into something more complex than expected:

> *a system of alternative yet inter-related pathways through adversity; a*
> *multidimensional, multileveled, dynamic and transformative health*
> *construct underpinned by salutogenesis, and with biological,*
> *psychological, cognitive, behavioural, and spiritual/cultural influences.*

This unique and multidimensional definition places volunteer firefighter resilience within a

framework of a complex adaptive system (CAS). Resilience is informed by, and informs, the paradigms of CAS, salutogenesis, and positive psychology through reciprocal relationships as will be discussed in the following sections of this chapter. Situating resilience across and within multiple disciplines is one of the contributions of this programme of study offering depth and breadth to the construct.

9.4   IMPLICATIONS FOR THEORY

9.4.a   Resilience In Volunteer Firefighters

Meeting the primary purpose of the programme of study, a theory of resilience was constructed from concurrent data collection and analysis. The theory meets the criteria for a grounded theory study in its originality, credibility, resonance, and usefulness (Charmaz, 2014) with credibility, resonance, and usefulness discussed in section 6.5. The originality of the theory is in the emergence of six core categories: social support, personal resources, meaning-making, culture, leadership, and knowledge and the multiple sub-categories. Embedded within the theory are the relationships between and among the categories which provide meaning (the how and why) to the theory in the context of volunteer firefighters; those relationships are representative of the interactions that occurred with the data as well as those that occur for individual firefighters and as part of the social construct of the volunteer FRS. The relationships or pathways offer flexibility to the construct which is one of the strengths of this theory - resilience may exist in the absence of one or more categories because the relationships between and among the other categories allow alternative pathways to resilience.

The theoretical and social significance of the theory is in its challenge of the notion that there are static end-points of resilience; this theory is unique in this aspect yet supports the calls for multiplicity and flexibility (see for example: Bonanno, 2013; Ungar, 2011) in the conceptualization of resilience. The originality of the theory is in its complexity which further informs the understanding of resilience as a multidimensional construct (Masten, 2014) and lends credence to the calls for paradigmatic shifts and consideration of cross-disciplinary perspectives in conceptualizing resilience (Tusaie & Dyer, 2004).

This programme of research supports Bonanno's assertion (2004) that the resilience capacity of people has been underestimated and offers a novel context for viewing resilience in a high-risk profession. Firefighter perspectives of stress and coping were invariably positive and health-focused, and participants waxed eloquently about resilience, as individuals and within the context of the FRS. Granted, the interviews were explicated as an inquiry into 'resilience' which may have biased the participants to focus on resilience, but there was also lots of room within the interviews for participants to frame their responses to more of an illness-focus or to use negative language in their conversations which they did not.

The context (volunteer FRS) and the methods (co-creating knowledge in partnership with firefighters) provide unique perspectives to the conceptualizations of resilience. This programme of study advances the understanding and conceptualization of resilience theory by providing a theory in the context of volunteer firefighters thereby further supporting the push for resilience research across contexts and cultures.

9.4.b   Integrating Resilience Theory Across Disciplinary Boundaries

Another contribution of this programme of study is in its transdisciplinarity (Choi & Pak, 2006, 2008); not only does the theory inform the understanding of resilience, it also informs and is informed by complexity theory, the field of positive psychology, and salutogenesis theory. Although one hope of the research was that the theory of resilience in volunteer firefighters might align with salutogenesis, the resonance between the data, the categories, and the relationships within the salutogenic framework was a bit of a surprise yet personally gratifying in its congruence with my own epistemological stance. As well, surfacing the alliances between resilience theory and complex adaptive systems, and resilience and positive psychology offer unique lenses to the integration of knowledge across diverse disciplinary boundaries. These alliances will be discussed in the following sections.

Resilience theory and salutogenesis

This theory of resilience in volunteer firefighters is conceptually related to salutogenesis or the 'origins of health', and although salutogenesis was defined in section 2.6.a and further

discussed in section 7.4.c that conceptualization has been enriched by this programme of study and bears further discussion.

When I first began researching resilience, it appeared on the surface that there was a link between resilience and health promotion/salutogenesis and other researchers had also made the connection (Eriksson & Lindstrom, 2011). However, Eriksson & Lindstrom state the main difference between resilience and salutogenesis is that, unlike salutogenesis, resilience lacks a theoretical framework hence there is no coherent evidence nor capacity to evaluate a construct that is dependent upon evidence. Prior to this research into resilience, lack of theory and evidence may have been the case with multiple definitions, models, and contexts for the construct; with this research I offer a theory of resilience in volunteer firefighters that may provide a foundation for future evidence and evaluation. I see the relationship between salutogenesis and resilience but I recognize the limitations in trying to place resilience solely within a salutogenic framework and suggest that resilience is a system in and of itself. There is congruence between resilience and the operationalization of salutogenesis as a "sense of coherence" (Almedom, 2005, p. 255) in that both concepts are epistemologically situated in a health worldview. As well, a sense of coherence (SOC) and the attending subsets of comprehensibility (ability to make sense of tough calls), manageability (having confidence in the capacity to manage stressors), and meaningfulness (the motivation to be involved in the world despite work-related stressors) constitute an attitude and way-of-being that allows firefighters to make meaning of life and adversity within a salutogenic frame of reference. Similarly however the meaning-making category in the theory of resilience in volunteer firefighters is congruent with salutogenesis and parallels our knowledge of salutogenesis as a health concept. Meaning-making as a category of resilience theory is obviously closely aligned with SOC and salutogenesis, but so too are other categories: personal resources (manageability), knowledge (comprehensibility), and relationships (meaningfulness) demonstrating that a simple cause/effect approach to viewing resilience or salutogenesis is not possible. They are however complementary to one another and add depth to the understanding of both constructs in their application to firefighters.

Certainly resilience is situated within a health framework rather than the traditional deficit

models of disease and illness, and has been consistently linked to health promotion (see for example: Lindstrom & Eriksson, 2006). I have often felt like a 'voice in the wilderness' as Antonovsky reportedly did (Sagy et al., 2015) when attempting to promote a salutogenic perspective in nursing, and although Sagy et al. suggest that resistance to the salutogenic paradigm has ceded to acceptance, I do not find this to be so in either nursing or the FRS; however this programme of study has provided useful, resonant, and original contributions to the conceptualization of health if not salutogenesis. Salutogenesis is concerned with the origins of health whereas the theory of resilience in volunteer firefighters seems more closely aligned with a system of positive health (as opposed to the origins of that health). Even Antonovsky noted there is no clear path from the concepts of salutogenesis to the policies and practices of health in individuals and groups (Lindstrom & Eriksson, 2006), yet volunteer firefighters who tend to be 'action-oriented' are looking for practical application of theory; this raises questions about the relevance of salutogenesis to firefighter practice. Recent works though implicate salutogenesis in public health and social justice practices (see for example: Friedli, 2009) through the identification of health assets that may help decrease health inequities (i.e. firefighters can use salutogenic resources and a sense of coherence to influence conditions which may help them to better cope with adversity).

Developing a strong sense of coherence includes emotional connectivity or the capacity to connect with one's feelings along with social support, meaningful activity, and capacity for reflection, introspection and learning (see for example: Almedom & Glandon, 2007; Eriksson & Lindstrom, 2011) which are all part of this resilience theory. Firefighters have noted that resources, relationships, meaning-making, culture, leadership and knowledge combine to create the system of resilience hence a link can be made from firefighters' perspectives on resilience to salutogenesis; there is a conceptual fit with Antonovsky's (1987) sense of coherence (firefighters find life meaningful, understandable, and manageable; they have the capacity and flexibility to make use of health assets) as well as other key salutogenic concepts such as locus of control (firefighters recognize when they have 'control' over rescue outcomes and recognize the value in the responding to tough calls in service to their community), self-efficacy (firefighters seek to be 'better' responders and better citizens – providing service), and learned resourcefulness (firefighters are lifelong learners in the

contexts of the FRS and in simply want to 'know more' about phenomenon that interest them). Practically, this theory of resilience resonates strongly with volunteer firefighters.

Within the context of salutogenesis is the idea of positive health, defined as: "the group of subjective, biological, and functional assets that actually increase health" (Seligman, 2011, p. 210). Subjective health assets include hope, optimism, positive emotions, sense of meaning and life satisfaction; biological assets are physical capacities and fitness such as cardiac fitness; functional assets include close family and friends, meaningful work, social support and sense of community, social roles, etc. Seligman and colleagues (2013) examined the relationships between biological, functional and subjective assets as contributors to better health noting that assets do not exist in isolation of one another; similarly to components of resilience – there are bi-directional inter-relationships across and between categories of resilience as there are with health assets. Firefighters clearly reflect a health orientation and articulate a number of health assets in the context of resilience; in this study, the constructivist grounded theory of resilience in volunteer firefighters arose from and is aligned within the context of salutogenesis. Further, this research moves our understanding of resilience from a 'voice in the wilderness' as noted in section 3.3, to a credible, resonant, and useful understanding of resilience as a construct encompassing salutogenesis and positive health.

Resilience as a complex adaptive system

The questions and aims of this programme of research are complex and impossible to reduce to simple linear renditions. How firefighters react to and cope with occupational stressors are as heterogeneous as the firefighters themselves. The definition of resilience that emerged from the data is multi-layered and reflects a 'systems' orientation rather than being sequentially structured. The theory of resilience is neither linear nor neat/tidy in its representation of the relationships between and among the dynamic core categories. Theories of resilience have considered resilience as an overarching concept using the metaphor of an umbrella (see for example: Bonanno, 2005; Masten & Obradovic, 2006), and also as a linear model with unidirectional and bidirectional lines that show connections

between aspects of resilience (see for example: de Terte et al., 2014). These conceptualizations are reductionist in their visual representations in order to explain a complex phenomenon in easily understood language and models; this languaging and apparent simplicity are foundational to raising the discourse about resilience and in unpacking the theory. The findings of this research however conceptualize resilience as a *complex adaptive system;* human beings are 'systems' and resilience is the capacity of the system to adapt and continue to evolve in the context of adverse events. The notion of resilience as a complex adaptive system is unique to this research, yet helps to understand resilience beyond the state/trait and cause/effect arguments, and has the potential to assist in building solutions in a variety of contexts whilst considering resources in novel and innovative ways (Ungar, 2008); more will be said about this in section 9.6. Our understanding of system theories, complexity science, and complex adaptive systems has evolved over the past 40 years, and a brief history follows in order to situate this research with complex systems theory.

Review of complexity theory

Complex systems theory or *complexity theory* is founded on a variety of disciplines and understandings, but has evolved from *systems theory* which is a framework that has been utilized for some years to study organizations and to offer models for understanding non-linear organizational phenomenon. Essentially, systems theory allows organizational leaders to influence factors (such as people, processes, behaviours, values, etc.) that result in change, rather than manage or action the change themselves; systems thinkers influence culture, productivity, and overall evolution of organizations (see for example: Senge, 2006). Systems thinking recognizes that all organizations must be "learning organizations" (Senge, p. 4) engaged in ongoing innovations and change in order to respond effectively to the complexity and dynamism that are inherent in organic phenomenon such as organizations, people, and products. Systems thinking is challenging to understand and accept because it requires us to look beyond our common human need for reductionism and simplicity, and to accept the 'messiness' of phenomenon – which in turn requires us to utilize other methods of inquiry and understanding such as the methods and methodology of this research.

Further to systems thinking are the ideas of *complexity science*, which influences our understanding of phenomena as complex and dynamic, unable to be fully known nor 'controlled' for, concepts that differentiate complexity from systems theory. Complexity is "the integration and relationships of…core concepts, and…more than the sum of the parts" (Weburg, 2012, p. 272) as is seen in my theory of firefighter resilience. Although there are core concepts to a phenomenon, complexity recognizes the dynamic nature of the relationships between and among those concepts, along with the animated integration of concepts at multiple levels, meaning that our understanding of phenomenon must also be dynamic and multi-contextual. Within complex systems however, there is a certain interconnectedness, coherence and self-organization, and the interconnections are not disconnected nor rigid. The agents within complex systems are in constant motion and act simultaneously yet coherently, influencing one another hence adding to the 'stable dynamism' of the phenomenon (see for example: Kauffman, 2014; Waldrop, 1992). Complexity science may seem quite similar to chaos theory, yet complexity theorists maintain that unlike chaos, complexity allows and accounts for the coherence of self-organizing, complex systems, again as seen in the theory of resilience that emerged from the data. Complex systems reside at the "edge of chaos", the term coined by Waldrop (1992) to describe "the balance point…where components of a system never quite lock into place, and yet never quite dissolve into turbulence…the place where a complex system can be spontaneous, adaptive, and alive." (p. 12).

Complex adaptive systems (CAS) theory endeavours to understand non-linear, complex systems with multiple points and levels of influence. For example, interconnections between/among components of phenomenon become more evident as does the recognition that phenomenon are more than the sum of their parts (James, 2010); in this research, categories of resilience in volunteer firefighters (i.e. relationships, meaning-making, culture, etc.) transact with one another in multiple ways in order to form the complex system that is resilience. Complexity thinking can also be applied to the conceptualization of 'theory' as well in order to understand that theories are not homogenous, predictable, nor stable; they are context-dependent and change and evolve as our understanding of phenomenon change and evolve. Complexity thinking is informed by the findings of this programme of study – a

theory that is dynamic, context-specific, and multi-dimensional, adding another context to complexity thinking. In return, understanding resilience as a CAS validates the complexity of the theory. Ungar (2011) states the "desire to identify relatively simple relationships between protective processes and predictable outcomes has undermined the contributions of resilience studies", noting "many different starting points can lead to many different but equally desirable ends by many different processes relevant to different ecologies" (p. 7). In this case, the theory of resilience in volunteer firefighters is a multi-dimensional, multi-levelled, dynamic, and transformational conceptualization of a health construct. There are multiple start points and multiple levels of relationships that lead to resilience in this specific context; it is exciting to think of other contexts where the theory may be applicable.

A key contribution of this thesis is in the alignment of resilience with CAS. Granted, the thought of situating the theory of resilience within the science of complexity seems extremely daunting; indeed this exercise has resulted in the feeling that my head is going to explode as I struggle to explain and summarize CAS and resilience in the volunteer FRS and I cannot imagine reading this through more traditional ontological and epistemological lenses. However, those lenses have not served our understanding of resilience well, and have stalled our mastery of this very complex concept. So rather than a secular, temporal, or constricted view, why not think of resilience as a complex adaptive system? Kauffman (2014, p. 5) calls for people to "recover our sense of worth" through complex pluralistic explorations of phenomenon, an approach to research that I obviously support through the choice of methodology and methods for this research; ultimately, situating resilience as a CAS, although messy, offers depth, breadth, and future directions for our evolving understanding of the concept. Consequently, resilience in volunteer firefighters is defined as a 'system'.

However, actually comprehending and conceptualizing the phenomenon of resilience requires looking beyond the uni-dimensional creation of these words and ideas, and becoming comfortable at the 'edge of chaos' that is inherent in research on resilience; I suggest that research as a whole must become more comfortable on the edge as we realize that 'truth' and knowledge are complex, dynamic, and pluralistic.

In summary, the aims of the programme of research lend themselves to positioning volunteer firefighter resilience in novel and complex paradigms. The theory of resilience in this programme of study contributes to our conceptualizing resilience as a CAS, as well as representing CAS as a theory of resilience.

Resilience and positive psychology

Another significant contribution of this programme of study is in the situation of resilience within the discipline of positive psychology. The theory that emerged from firefighters is congruent with the move in psychology from a focus on disease and people's responses to illness within a biomedical model to the more recent *positive psychology* that seeks to understand the health of individuals and populations, the determinants of health, and health assets.

As human beings, we are motivated to fulfil our potential, function at optimal levels, and achieve a pleasurable and meaningful life. Positive psychology is concerned with how best to support these aspirations in us in ways that are both good for us and those around us (Linley, 2015, p. 2).

Resilience, as conceptualized and contextualized in this programme of study, is an archetype of positive psychology, and informs and is informed by the field. Positive psychology has been aligned with Rogers' *person-centred approach* which I consider a practical and philosophical underpinning to my own nursing practice. Within the field of positive psychology, people are their own best experts by knowing and making sense of their internal and external worlds. Linley and Joseph (2004) see positive psychology as relevant to Rogers' approach in that both adopt the assumption that people have "an innate constructive directional tendency" (p. 715) that motivates them towards health through an "organismic valuing process" (p. 715), the intrinsic nature of our choices and values that drives us towards self-actualization rather than to ill-health. Similarly, in positive psychology, constructs such as hope, optimism, capacity for health and wellbeing, etc. are driven from within the person as opposed to being inflicted upon them by external forces such as a

therapist or therapeutic model. The philosophy is analogous with the aims of this research: firefighters name the stressors, stress reactions, and coping methods that are relevant and meaningful to them in the context of their work, rather than having those imposed by someone like myself whose context is very different from the firefighters.

Also in positive psychology, well-being and health are the intended outcomes but not to the exclusion of illness, rather as an integrative approach that is founded not on deficits but upon the innate positive values and wishes of individuals. Seligman (2011) focuses his exploration of positive psychology on wellbeing; he notes the challenges of having consistent measures for wellbeing across cultures and contexts, and suggests that a "dashboard" (Forgeard et al., 2011, p. 89) or menu of indicators be measured. This recognition of the complexity of wellbeing is similar to the task of moving the concept of resilience forward within the FRS but also in other disciplines such as psychology, and highlights how complex concepts require multiple lenses through which to view, understand, articulate, and measure these constructs.

Further contributing to the originality of this programme of study, the theory of resilience in volunteer firefighters and its relationship with positive psychology is also congruent with the development of sense of coherence (Antonovsky, 1989); SOC, as with resilience, rests on availability and engagement with social support, participation in meaningful activities, ability to connect with one's feelings, and capacity for and utilization of reflection and introspection. Similarly, Seligman's theory of well-being makes use of factors of positive emotion, engagement, relationships, meaning in life, and accomplishment (2011, p. 241); the theory of resilience constructed in this study advances Seligman's theory of well-being and also links well-being to resilience further corroborating the conceptualization of resilience as a dynamic, multidimensional construct.

Positive psychology differs from post-traumatic growth (Seligman, et al., 2013) in that positive psychology relates to the subjective experience of well-being, whereas post-traumatic growth (PTG) relates to the outcome of a change process subsequent to adversity. Deppa (2015) describes PTG as the positive psychological changes that result from the

struggle to cope with adversity, and Chopko & Schwarz (2009) describe PTG as the positive changes within a person that result in a changed worldview; PTG may or may not be part of a trajectory of resilience to adversity. Resilience also differs from PTG in that resilience is the more common pathway through exposure to PTE's. Essentially, PTG is an outcome that may be influenced by resilience whereas resilience is a system that can either contribute to or result in PTG.

This research also advances Hobfoll's 'conservation of resources' (COR) theory and possession of resources/resource caravans to promote resilience (Hobfoll, 2014). Hobfoll has long posited that people seek to retain resources that contribute to life, and that stress results when resources are lost or threatened; resources are seen as sociocultural in nature and essential to resilience hence "caravans" (2002, p. 312) that convey and gain resources need to be integrated into the process of adaptation to adversity. Firefighters in TBFRS articulated a wide variety of resources that are utilized, including adaptive coping as discussed in sections 7.4.a-c. The constructed grounded theory of firefighter resilience supports Hobfall's perspectives in its explication of categories that are integrated and interactional, and negotiated by firefighters within the context of their heterogeneous experiences/reactions to work-related stressors; the stressors, reactions, and coping methods are dynamic and intertwined. Hobfoll, in turn, contributes to the theory of resilience in the FRS: categories and relationships are integrated at multiple levels in order to support adaptation to stress as per the COR theory.

This research also reinforces Ellis' (2015) work with children and his view of adaptive responses to stress; these works are clearly rooted in positive psychology with its focus on strengths, resources, adaptability, and flexibility. Concurrently, firefighters see the stressors and stress response of the job as normal and expected, and this adaptive view contributes to resilience through, for example, personal resources such as optimism and hope. This research further contributes to the discourse on positive psychology through its orientation of the human stress response and resilience as adaptive processes (Ellis, 2015). Historically, stress has been conceived of as a medical or pathological response; however, recognizing firefighters experience normal and expected responses to stress at both the micro and

macro levels, and framing these as inherently adaptive, allows resilience research to continue to focus on health, well-being, and positive outcomes of individuals and groups in the face of adversity.

In summary, as the theory of resilience in the FRS emerged from the data, the link to health and health assets hence positive psychology (Seligman et al., 2013) also became apparent. The theory of resilience in volunteer firefighters informs the field of positive psychology with its situatedness in the FRS, a context that has been absent in the positive psychology agenda to date as well as with its articulation of positive adaptive categories of the theory. As well, this thesis offers categories of resilience that have been absent in the literature: leadership and knowledge which both add to the understanding of resilience within the positive psychology framework. In turn, the theory of resilience is validated by positive psychology's grounding in the strengths and capacities of people and relationships.

9.5   IMPLICATIONS FOR PRACTICE (APPLICATION)

Practically, this constructivist grounded theory serves as a foundation for the development of policy and practice in psychological health in volunteer FRS as well as a model for future research with other FRS and emergency services. Encouragingly, a small sample of career firefighters and nurses indicated that the theory has credibility, resonance, and utility beyond the TBFRS. Resilience training, planning and evaluation, behaviour change, and knowledge translation/exchange are a few of the possible applications of this theory, and once applied the theory and practice will require ongoing evaluation – yet another area for future research.

This theory of resilience in volunteer firefighters can provide the foundation and framework for occupational mental health programs within the FRS, and the theory in whole or in part can underpin specific practices such as health education, CISM, anti-stigma campaigns, and leadership strategies. Much of the discourse in Canadian workplaces is on the creation and maintenance of a healthy, safe workplace (see for example: Mental Health Commission of Canada, 2013a) yet health and safety requires dynamic and multidimensional policy and practice that engages workers individually and organizationally. This seemingly

overwhelming task can begin with one or more of the resilience categories as start points, and initially focus on the interface of those categories; for example, culture, social support, and personal resources.   There are a myriad of applications for this theory; the potential is as dynamic and multi-dimensional as the theory itself.

Some of the criticisms of existing occupational resilience programs as discussed in section 3.5.b are: they lack a clear definition of resilience; they lack concrete outcome measures; and they are not informed by evidence. Partly in response to these criticisms the Mental Health Commission of Canada has developed a national standard of workplace psychological health that offers a comprehensive framework for occupational health (2013b). The standard includes templates for outcome measures and evaluation; evidence-informed practices such as peer support training, policy development, evaluation tools, etc. Evaluation is ongoing with over 40 pilot projects and continuous improvement frameworks under the auspices of a research team with expertise in applied research, mental health and addictions, and organizational health thereby providing a broad collaborative approach to psychological health in the workplace. The standard is applicable across many workplaces, and in combination with the new definition of resilience constructed by this programme of study, offers a way forward for FRS in the application of the theory.

Resistance to change is common in organizations (Kouzes & Posner, 2012) and FRS are no exception. As mentioned throughout this thesis, the historical view of resilience as the corollary of illness instead of a construct in and of itself, imbues literature and practice, and the FRS often holds the traditional view. Currently I am working with a career FRS on applying the theory of resilience as the foundation for their psychological health program. The theory has been presented and discussed with firefighters throughout the organization; there is an active and respected CISM program in the FRS, which is providing the foundation for the resilience theory – the CISM program is in need of 'updating' and the resilience theory offers the bones for this process (for example, the early initiatives focus on enhancing categories of personal resources, culture, leadership, and knowledge). The resilience construct will support the transition from a reactive CISM program to proactive psychological health program in keeping with the Mental Health Commission of Canada's standard on

workplace psychological health. Although there is financial and other practical support from management, there is some 'push-back' from the front-line firefighters whose union is engaged in a pitched battle with the provincial government to designate post-traumatic stress disorder as a 'presumptive classification'. Presumption means that PTSD is presumed to have arisen out of employment as a firefighter, and there is precedent for the classification for firefighters in other provinces. However, the fight for presumption means that firefighters are focused on risks and negative outcomes of their career, including diagnosis of mental illness; this way-of-being seems to be in direct opposition to the conceptualization of resilience that focuses on health, health promotion, strengths and capacities. The challenge, in this case, is to continue to offer resilience theory; however, implementation requires foundational work to be carried out that aligns resilience with firefighter health, not in opposition to those who experience negative outcomes to workplace stressors, but as a co-occurring health construct that exists in the context of the FRS. Presumption notwithstanding, psychological health of firefighters is a key initiative of the International Association of Firefighters (IAFF), a perspective that can be leveraged to ensure if not equal attention to resilience at least parallel initiatives to those of presumption. Having a theory of resilience that was constructed in partnership with firefighters lends credibility and context to the resilience and health discourse, and is imperative to moving any occupational mental health initiatives forward in the FRS.

As well, adoption of this theory of resilience has some very practical implications for budgets and personnel in career FRS. For example, in most FRS there is the practice of rotating personnel from one station to another and/or from one watch to another. The intention of rotation of personnel is usually to meet operational needs but the practice makes it challenging to ensure that relationships hence support is established within watches, stations, and the communities served by the station. A possible solution is for organizations (with representation from management, union, and front-line personnel) to collaborate in creating and maintaining a consistent crew system for each watch and station. This is where volunteer FRS have an advantage; with their smaller size it is easier to establish working relationships with all members of the FRS. Those working relationships and a culture of health ensure conversations about resilience are occurring prior to as well as following tough

calls, which in turn serves to create and sustain a culture of health and support. There are precedents in Canada for positive and resilient organizations within the FRS which may serve as models for other jurisdictions.

9.6   LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The results of this work revealed a number of important and unique findings, but there are limitations to the study, some of which are discussed next.

Biological contributors to resilience were not explored in this research. There is developing evidence that stress mediation occurs through relationships between neurobiological factors such as hormones, and other neurobiological mechanisms such as neuronal pathways and influences (see for example: Charney, 2004; Davydov et al., 2013; Ellis, 2015; Southwick et al., 2005). Recently, Yehuda et al. (2013) have proposed that different genes may be associated with different disease states, symptoms, and prognosis and that some genes may be receptive to "environmental regulation" (p. 1) hence, in theory, genetic interactions with environmental factors such verbal ventilation, exercise, education, etc. can and do influence resilience. The relationships between biology, environment, and resilience are exciting areas for further study.

As well, given that this study focuses on firefighters' perspectives of psychological resilience the qualitative nature of the research provides richness and depth in the telling of the experiences; however because the research is a purposive sample of eight firefighters in a single FRS (in addition to two participants from outside TBFRS), the breadth of understanding about resilience may be sacrificed somewhat despite several interviews with each firefighter resulting in over 45 hours of interview and a massive data set. Although there was a range of age, gender, rank, and years of experience represented in the sample, a limitation to purposive sampling is the potential exclusion of other perspectives such as volunteer and career firefighters from other FRS, hence testing of the resilience theory outside of TBFRS is imperative.

Also, as with all constructivist grounded theories, generalisations are not possible, however

this project resulted in a substantive theory of resilience and the data fits the theory. Once the theory was constructed, it was explored with five participants from outside the volunteer FRS. Within the external contexts the theory seems to be credible and original, resonates with other professionals, and has utility (see section 9.5 for further explanation). This CGT can now be tested across other FRS (career and volunteer) and other emergency service organizations which was the intent of the research – a focused exploration of the concept of resilience that will form the foundation for future research.

Other limitations to this study relate to the focus on resilience: the interview guide posed questions about health, resilience, coping, etc. and were framed in an open yet 'positive' way; what about firefighters who chose not to participate – do they see themselves as resilient? If questions had been posed about illness such as post-traumatic stress disorder (a topic that inundates media reports about emergency services in Canada at the time this thesis is being written), how might this have influenced who participated and how resilience is conceptualized? At this point it is unclear about how this theory of resilience is viewed by the other firefighters in the organization – a priority over the next months is to present the theory to the overall membership for discussion and feedback, followed by offers to other FRS for consideration.

There are several obvious directions for future research from the questions that surfaced as a result of the data. An intriguing finding is in the conceptualization of 'service' as a role, as a personal and organizational value, and as a way to make meaning of tragedy (section 8.8); there is much we do not understand about the overall concept of service, and this is a fascinating area for future research.

Also, we have enriched our knowledge of resilience and health in firefighters including the categories of culture, leadership, and knowledge, but many other questions have arisen. How exactly does culture impact resilience? Is there a culture of service in the FRS? How does a sense of service vary across different roles/levels within the FRS hierarchy – is it expressed/made sense of differently? If the culture of this FRS is 'healthy' (shared values, support, trust, etc.), what about the FRS who have less healthy work cultures – are they still

resilient? How might resilience manifest itself in 'unhealthy' (and what constitutes 'unhealthy') FRS cultures – is it similar to populations in conflict zones who 'adapt' (Ellis, 2015) to the stressors and still remain resilient? How do those firefighters who chose not to participate in the study see themselves in the context of resilience? Given that the research required participants to openly discuss their perspectives of health and resilience, and participants acknowledged they had given the concepts thought beforehand, their perspectives may not reflect the views/values/beliefs of fire personnel generally.

There is a universal human need for connection with others (Lester, 2013) and the literature suggests that illness prevention and recovery may not occur as a result of discovering new psychological insights or resolving internal conflicts. Instead, prevention and recovery may be in the connections with others, connections that ebb and flow as those who are living with the effects of PTEs negotiate relationships, repeatedly disconnecting and reconnecting with the world through those relationships. Lester reminds us that trauma is interpreted and experienced differently across and within cultures; as we know however resilience is the most common response to adversity and as we see from this research, relationships and culture are key categories of resilience. Therefore it is intriguing to think that having the core ability to negotiate, initiate, connect and reconnect with others in culturally relevant ways as a subcategory of resilience may not only protect against traumatic effects but may assist in transcending trauma if/when it occurs. This is an area for future research across disciplines: anthropology, psychology, nursing, psychiatry, etc.

9.7   CONCLUSIONS

This programme of research has met the aims of exploring firefighter experiences and understandings of work-related stress, stressors, and coping strategies as well as defining resilience in the context of the FRS. The programme has resulted in a constructivist grounded theory of resilience in volunteer firefighters and has advanced knowledge about resilience and firefighters. The definition and theory of resilience in the FRS contributes original knowledge and additional insights to the conceptualization of resilience across various disciplines, and advances the understanding of the construct:

[In order to be] scientifically valid, a theory must be refutable and indeed it is the goal of a theory to ultimately be rejected or incorporated into a broader more inclusive theoretical structure. (Hobfoll, 2001, p. 363)

The final section of this thesis highlights the original contributions of the programme of study.

9.8 ORIGINAL CONTRIBUTIONS – RESILIENCE AND BEYOND

The original contributions of this thesis:

- Examined experiences of volunteer firefighters

- Informs the understanding of resilience by providing a new definition of resilience

- Advances the understanding of resilience through construction of a theory of resilience in volunteer firefighters

- Offers a theory that can be tested in other populations who strive to understand psychological, cultural, and behavioural influences on health and health promotion

- Provides evidence that multiple inter-related factors influence resilience including social and cultural factors

- Suggests that leadership and knowledge inter-relate with other social and cultural factors to build resilience capacity

- Reinforces resilience as the norm after adversity albeit a norm that is informed by multiple dynamic interactional factors

- Offers interdisciplinary, and ultimately transdisciplinary, perspectives of resilience with influences from nursing, psychology, education, organizational and leadership providing further context to the firefighter perspective

- Rejects the conceptualizations of resilience as a single-dimensional model and/or a continuum of risk and recovery

- Suggests that appreciation of the complexity of resilience is in itself a resilient process – recognizing that we do not know 'all' there is to know about the construct, understanding that multiple lenses are required in order grasp the complexity, and continuing to strive for contextual and temporal meaning is an experience of living

- Provides an evidence base which informs theories regarding predictors and factors of resilience

- Extends the contours of the research literature defining salutogenesis

- Clarifies and provides clear direction informing the ontological assumptions and methodological approaches for future research methods exploring resilience

- Provides strong robust evidence for the contextualisation of resilience research

REFERENCES

Adams, S., Camarillo, C., Lewis, S., & McNish, N. (2010, Apr-June). Resilience training for medical professionals. *The Army Medical Department Journal,* September 10, 2010.

Adler, A.B., Litz, B.T., Castro, C.A., Suvak, M., Thomas, J.L., Burrell, L., McGurk, D., Wright, K.M., & Bliese, P.D. (2008). A group randomized trial of critical incident stress debriefing provided to U.S. peacekeepers. *Journal of Traumatic Stress*, *21*, 253–263.

Aldrich, D. & Meyer, M. (2015). Social capital and community resiliency. *American Behavioral Scientist, 59*(2), 254-269.

Almedom, A. (2005). Resilience, hardiness, sense of coherence, and posttraumatic growth: All paths leading to "light at the end of the tunnel"? *Journal of Loss and Trauma, 10*, 253-265.

Almedom, A., Brensinger, E., & Adam, M. (2010). Identifying the 'resilience factor': An emerging counter narrative to the traditional discourse of 'vulnerability' and 'social suffering'. In G. Lewando Hunt & H. Bradby (Eds). Global perspectives on war, gender, and health: The sociology and anthropology of suffering. pp. 127-145. Farnham, GB: Ashgate. Accessed from Proquest ebrary.

Almedom, A. & Glandon, D. (2007). Resilience is not the absence of PTSD any more than health is the absence of disease. *Journal of Loss and Trauma: International Perspectives on Stress & Coping, 12*(2), 127-143.

Alvarez, G. (2013). *Gallows humor as a resiliency factor among urban firefighters with specific implications on prevalence rates of PTSD*. Doctoral dissertation. Retrieved from ProQuest Dissertations and Theses. (Accession Order No. 3552414).

Amagoh, F. (2008). Perspectives on organizational change: Systems and complexity. *The Innovation Journal: The Public Sector innovation Journal, 13*(3), article 3 online. Retrieved from: http://www.innovation.cc/scholarly-

style/amagoh3dec2008jag2rev1.pdf

Angelo, R. & Chambel, M. (2014). The role of pro-active coping in the Job Demands-
Resources Model: A cross-section study of firefighters. *European Journal of Work and
Organizational Psychology, 23*(2), 203-216.

Antai-Otong, D. (2001). CISD: A health promotion model for workplace violence. *Perspectives
of Psychiatric Care, 37*(4), 125-139.

Antonovsky, A. (1979). *Health, Stress, and Coping.* San Francisco, CA: Jossey-Bass.

Antonovsky, A. (1987). *Unraveling the mystery of health: How people manage stress and stay
well.* San Francisco, CA: Jossey-Bass.

Antonovsky, A. (1990). A somewhat personal odyssey in studying the stress process. *Stress
Medicine, 6,* 71-80.

Antonovsky, A. (1996). The salutogenic model as a theory to guide health promotion. *Health
Promotion International, 11*, 11-18.

Atkinson, P., Martin, C., & Rankin, J. (2009). Resilience revisited. *Journal of Psychiatric and
Mental Health Nursing, 16*, 137-145.

Austin, W. & Boyd, M. (2015). *Psychiatric and Mental Health Nursing for Canadian Practice*.
3rd Edition. Philadelphia, PA: Lippincott Williams & Wilkins.

Avey, J., Luthans, F., & Jensen, S. (2009). Psychological capital: A positive resource for
combating employee stress and turnover. *Human Resource Management, 48*(5), 677-
693.

Barkway, P. (2006). Creating supportive environments for mental health promotion in the
workplace. *Contemporary Nurse: A Journal for the Australian Nursing Profession, 21*(1),
131-141.

Bartone, P. (2006). Resilience under military operational stress: Can leaders influence hardiness. *Military Psychology, 18*(Suppl.), S131-S148.

Beaton, R., Murphy, S., Johnson, C., Pike, K., & Corneil, W. (1998). Exposure to duty-related stressors in urban firefighters and paramedics. *Journal of Traumatic Stress, 11(*4), 821-828.

Beaton, R., Murphy, S., Johnson, C., Pike, K., & Corneil, W. (1999). Coping response and post-traumatic stress symptomology in urban fire service personnel. *Journal of Traumatic Stress, 12*(2), 293-308.

Benner, P. (1984). From novice to expert: Excellence and power in clinical nursing practice. Menlo Park, CA: Addison-Wesley.

Benner, P., Sutphen, M., Leonard, V., & Day, L. (2010). *Educating nurses: A call for radical transformation.* San Francisco, CA: Jossey-Bass.

Benz, C., Bull, T., Mittelmark, M., Vaandrager, L. (2014). Culture in salutogenesis: The scholarship of Aaron Antonovsky. *Global Health Promotion, 21*(4), 16-23.

Berger, R. (2016, May 19). An ecological-systemic approach to resilience: A view from the trenches. *Truamatology.* Advance online publication. http://dx.doi.org.ezproxy.viu.ca/10.1037/trm0000074

Berkman, L. & Syme, S. (1979). Social networks, host resistance, and mortality: A nine year follow-up of Alameda County residents. *American Journal of Epidemiology, 109(*2)*, 186-204.

Bernardo, A. (2010). Extending hope theory: Internal and external locus of trait hope. *Personality and Individual Differences, 49,* 944-949.

Birks, M., Chapman, Y., and Francis, K. (2008). Memoing in qualitative research: Probing data and processes. *Journal of Research in Nursing, 13*(1), 68-75.

Biron, C., Karanika-Murray, M., & Cooper, C. (2012). Organizational interventions for stress and well-being: An overview. In C. Biron, M. Karanika-Murray, & C. Cooper (Eds). *Improving Organizational Interventions for Stress and Well-being.* (pp. 1-17). New York, NY: Routledge.

Biron, C. & Karanika-Murray, M. (2014). Process evaluation for organizational stress and well-being interventions: Implications for theory, method, and practice. *International Journal of Stress Management, 21*(1), 85-111.

Blaney, L. (2003). *In the inferno: Critical incident stress management (CISM) in the fire service - what works and how do we know?* Masters' thesis, Royal Roads University (Canada), ProQuest Dissertations Publishing, 2003. MQ77888 Royal Roads.

Blaney, L. (2005). Leaping into the inferno: CISM works! *Journal of Fire Safety, Technology, and Management, 9*(2), 19-26.

Blaney, L. (2006). *Leaping into the inferno: Critical incident stress management programs in the fire and rescue service of the United Kingdom - what works and how do we know?* (Internal document - research report). Sunderland, UK: Tyne-&-Wear Fire Rescue Service.

Blaney, L. (2009). Beyond 'knee jerk' reaction: CISM as a health promotion construct. *Irish Journal of Psychology, 30*(1), 37-58.

Blaney, L. (2012). *Health and resilience in the context of Critical Incident Stress Management (CISM): A pilot study of firefighter stress and coping in Canada and the United Kingdom.* Internal document – research report. Langford, BC and Buckinghamshire, UK: Langford Fire Rescue Service, and Buckinghamshire Fire Rescue Service.

Blaney, L. & Brunsden, V. (2015). Resilience and health promotion in high risk professions: A pilot study of firefighters in Canada and the United Kingdom. *The International Journal of Interdisciplinary Organizational Studies 10*(2), 23-32.

Bonanno, G. A. (2004). Loss, trauma, and human resilience: Have we underestimated the

human capacity to thrive after extremely aversive events? *American Psychologist, 59*(1), 20-28.

Bonanno, G. (2005). Resilience in the face of potential trauma. *Current Directions in Psychological Science, 14*(3), 135-138.

Bonanno, G. (2006). Resilience in the face of potential trauma: Clinical practices and illustrations. *Journal of Clinical Psychology, 62*(8), 971-985.

Bonanno, G. (2009). The other side of sadness: What the new science of bereavement tells us about life after loss. New York, NY: Basic Books.

Bonanno, G. (2012). Uses and abuses of the resilience construct: Loss, trauma, and health-related adversities. *Social Science and Medicine, 74*, 753-756.

Bonanno, G. (2013). Meaning making, adversity, and regulatory flexibility. *Memory, 21*(1), 150-156.

Bonanno, G., Brewin, C. R., Kaniasty, K., & La Greca, A. (2010). Weighing the costs of disaster: Consequences, risks, and resilience in individuals, families, and communities. *Psychological Science in the Public Interest, 11*(1), 1-49.

Bonanno, G. & Dimich, E. (2013). Annual Research Review: Positive adjustment to adversity – trajectories of minimal impact resilience and emergent resilience. *Journal of Child Psychology and Psychiatry, 54*(5), 378-421.

Bonanno, G., Galea, S., Bucciarelli, A., & Vlahov, D. (2007). Psychological resilience after disaster: New York City in the aftermath of the September 11th terrorist attack. *Psychological Science: A Journal of the American Psychological Society / APS, 17*(3), 181-186.

Bonanno, G. & Mancini, A. (2012). Beyond resilience and PTSD: Mapping the heterogeneity of responses to potential trauma. *Psychological Trauma: Theory, Practice, and Policy, 4*(1), 74-83.

Bonanno. G., Papa, A., Lalande, K, Westphal, M., Coifman, K. (2004). The importance of being flexible: The ability to both enhance and suppress emotional expression predicts long-term adjustment. *Psychological Science, 15*(7):482–487.

Bonanno, G., Pat-Horenczyk, R., & Noll, J. (2011). Coping flexibility and trauma: The perceived ability to cope with trauma (PACT) Scale. *Psychological Trauma: Theory, Research, Practice, and Policy, (3)*2, 117-129.

Bonnano, G., Rennicke, C., & Dekel, S. (2005). Self-enhancement among high-exposure survivors of the September 11th terrorist attack: Resilience or social maladjustment? *Journal of Personality & Social Psychology, 88*(6), 984-998.

Bonanno, G., Romero, S., & Klein, S. (2015). The temporal elements of psychological resilience: An integrative framework for the study of individuals, families, and communities. *Psychological Inquiry, 26*(2), 139-169.

Borgatti, S. (2009). *Introduction to grounded theory.* Retrieved September 2, 2010, from http://www.analytictech.com/mb870/introtoGT.htm

Boscarino, J. A., Adams, R. E., Foa, E. B., & Landrigan, P. J. (2006). A propensity score analysis of brief worksite crisis interventions after the world trade center disaster: Implications for intervention and research. *Medical Care, 44*(5), 454-462.

British Columbia Professional Firefighters Association. (1999). *Heart to Heart: A report on the Hazards Facing Fire Fighters.* Burnaby: International Association of Fire fighters & Canadian Labour Congress.

Brown, J., Mulhern, G. & Joseph, S. (2002). Psychological distress among firefighters in Northern Ireland. *Journal of Traumatic Stress, 15*(2), 161-168.

Brunsden, V., Hill, R., & Maguire, K. (2012). The impact of process issues on stress interventions in the emergency services. In C. Biron, M. Karanika-Murray, & C. Cooper (Eds). *Improving Organizational Interventions for Stress and Well-being: Addressing Process and Context. (*pp. 238-257). Hoboken, NJ: Taylor and Francis.

Brunsden, V., Woodward, L., & Regel, S. (2003). Occupational stress and posttraumatic reactions in firefighters and control room staff. *Journal of Fire Safety, Technology, and Management, 8*(3), 1-14.

Bryant, R. A., & Harvey, A. G. (1995). Predictors of distress. *Journal of Nervous and Mental Diseases, 183*, 267-271.

Burns, E., Fenwick, J., Schmied, V., & Sheehan, A. (2012). Reflexivity in midwifery research:

Canada. Senate Subcommittee on Veterans Affairs (VEAC). (2014b) *Evidence*, 2nd Session, 41st Parliament, 11 June 2014 (Wayne Corneil). http://www.parl.gc.ca/Content/SEN/Committee/412/veac/pdf/06issue.pdf Accessed November 21, 2015.

Canadian Association of Fire Chiefs. (2015). CAFC and IAFF launch mental wellness initiatives. Press release: October 13, 2015. Retrieved from: http://www.cafc.ca/news/257473/CAFC-and-IAFF-Launch-Mental-Wellness-Initiative.htm

Canadian Council of Motor Transport Administrators. (2015). *Canada's Road Safety Strategy 2015.* Ottawa, ON: Author. Retrieved from website: http://ccmta.ca/crss2015/index.php

Cannon, W. (1953). Bodily Changes in Pain, Hunger, Fear, and Rage. Boston, MA: Branford.

Carper, B. (1978). Fundamental patterns of knowing. In P. Reed & N. Shearer (Eds). *Perspectives on Nursing Theory* (5th Ed). 377-384. Philadelphia, PA: Lippincott Williams & Wilkins.

Carver, C. (1997). You want to measure coping but your protocol's too long: Consider the brief COPE. *International Journal of Behavioral Medicine, 4*, 92-100.

Centre for Addiction and Mental Health. (2015, June). Association between daily use of social media and mental health among students in Ontario. *CAMH Population Studies eBulletin, 16*(2). Retrieved from:

http://www.camh.ca/en/research/news_and_publications/pages/research_population_ebulletins.aspx

Chamberlin, M. & Green, H. (2010). Stress and coping strategies among firefighters and recruits. *Journal of Loss and Trauma: International Perspectives on Stress and Coping, 15*(6), 448-560.

Charmaz, K. (2005). Grounded theory in the 21st century. In N. K. Denzin, & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd edition, pp. 507-535). Thousand Oaks, CA: Sage Publication Inc.

Charmaz, K. (2006). Constructing grounded theory: A practice guide through qualitative analysis. London: Sage Publications Inc.

Charmaz, K. (2008). *Grounded theory*. In Jonathan A. Smith (Ed.), *Qualitative Psychology: A Practical Guide to Research Methods*, 2nd ed. (pp. 81-110). London: Sage Publications Inc.

Charmaz, K. (2011). Grounded theory methods in social justice research. In N.K. Denzin and Y.E. Lincoln (Eds): *The Sage Handbook of Qualitative Research.* 4th Ed. (pp. 359-380). Thousand Oaks, CA: Sage Publications Inc.

Charmaz, K. (2014). *Constructing grounded theory.* 2nd Edition. London: Sage Publications Ltd.

Charney, D. (2004). Psychobiological mechanisms of resilience and vulnerability: Implications for successful adaptation to extreme stress. *American Journal of Psychiatry, 161*(2), 195-216.

Childs, E. & de Wit, H. (2014). Regular exercise is associated with emotional resilience to acute stress in healthy adults. *Frontiers in Physiology, 5,* Article 161, 1-7.

Chinn, P. & Kramer, M. (2011). *Integrated theory and knowledge development in nursing.* 8th Edition. St. Louis, MO: Elsevier Mosby.

Choi, B. & Pak, A. (2006). Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy: 1. Definitions, objectives, and evidence of effectiveness*. Clinical and Investigative Medicine, 29*(6), 351-364.

Choi, B. & Pak, A. (2008). Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy: 3. Discipline, inter-discipline distance, and selection of discipline*. Clinical and Investigative Medicine, 31*(1), E41-E48*.*

Chopko, B. & Schwartz, R. (2009). The relation between mindfulness and posttraumatic growth: A study of first responders to trauma-inducing incidents. *Journal of Mental Health Counselling, (31)*4, 363-376.

Ciccetti, D. (2010). Resilience under conditions of extreme stress: a multilevel perspective. *World Psychiatry, 9*(3), 145-154.

Clancy, M. (2013). Is reflexivity the key to minimising problems of interpretation in phenomenological research? *Nursing Research, 20*(6), 12-16.

Coifman, K., Bonanno, G., Ray, R., & Gross, J. (2007). Does repressive coping promote resilience? Affective-autonomic response discrepancy during bereavement. *Journal of Personality and Social Psychology, 92*(4), 745-758.

Collaboration for Academic Education in Nursing (CAEN). (2014). Core concepts. *CAEN Curriculum Guide, Overview of the curriculum,* Part *II.* Accessed July 27, 2014 from http://www.caen.ca/curriculum-guide Restricted site. Comox, BC: Author.

Collins, P. (1998). Negotiating selves: Reflections on 'unstructured' interviewing. *Forum: Sociological Research Online, 3*(3), 1-18. Retrieved on August 10, 2014 from: http://www.socresonline.org.uk/3/3/2.html

Connor, K. & Davidson, J, (2003). Development of a new resilience scale: The Connor-
Davidson resilience scale (CD-RISC). *Depression and Anxiety, 18,* 76-82.

Cote, M. & Nightingale, A. (2012). Resilience thinking meets social theory: Situating social
change in socio-ecological systems. Progress in Human Geography, 36(4), 475-489.

Cotman, C. & Berchtold, N. (2002). Exercise: A behavioral intervention to enhance brain

Craft, L. & Perna, F. (2004). The benefits of exercise for the clinically depressed. *The Primary
Care Companion to the Journal of Clinical Psychiatry, 6*(3), 104-111.

Cripps, F. (2008). Exercise your mind: Physical activity as a therapeutic technique for
depression. *International Journal of Therapy & Rehabilitation, 15*(10), 460-465.

Culture. (n.d.) In Miriam Webster online. Retrieved August 21, 2016 from
http://www.miriamwebster.com/dictionary/culture

Cunliffe, A. (2009). On becoming a critically reflexive practitioner. *Journal of Management
Education, 28*(4), 407-426.

Davydov, D., Stewart, R., Ritchie, K., & Chaudieu, I. (2010). Resilience and mental health.
Clinical Psychology Review, 30, 479-495.

de la Plante, A. (1993). *Flame of Courage: The Canadian Firefighter*. Etobicoke, ON: Firefly
Books.

de Terte, I., Becker, J., & Stephens, C. (2008). An integrated model for understanding and
developing resilience in the face of adverse events. *Journal of Pacific Rim Psychology,
3*(1), 20-26.

de Terte, I. & Stephens, C. (2014). Psychological resilience in workers in high-risk
occupations. *Health and Stress, 30*, 353-355.

de Terte, I., Stephens, C., & Huddleston, L. (2014). The development of a 3-part model of psychological resilience. *Stress and Health, 30,* 416-424.

Deahl, M., & Bisson, J. (1995). Dealing with disasters: Does psychological debriefing work? *Journal of Accident and Emergency Medicine, 12*, 255-258.

Deahl, M. P., Srinivasan, M., Jones, N., Neblett, C., & Jolly, A. (2001). Evaluating psychological debriefing: Are we measuring the right outcomes? *Journal of Traumatic Stress, 14*(3), 527-529.

Del Ben, K., Scotti, J., Chen, Y., Fortson, B. (2006). Prevalence of posttraumatic stress disorder symptoms in firefighters. *Work & Stress, 20*(1), 37-48.

Denver, J. (1981). Perhaps love. [Recorded by John Denver and Placido Domingo]. On *Perhaps love* [CD]. New York, NY: CBS Masterworks.

Deppa, K. (2015). Resilience training for firefighters: A proposed approach. *Master of Applied Positive Psychology (MAPP) Capstone Projects.* Paper 82. Available at: http://repository.upenn.edu/cgi/viewcontent.cgi?article=1083&context=mapp_capstone

Dey, I. (1999). *Grounding Grounded Theory.* San Diego, CA: Academic Press.

Doty, B. (2010). The construct of resilience and its application to the context of political violence. Pursuit: The Journal of Undergraduate Research at the University of Tennessee, 1(1), 137-154. http://trace.tennessee.edu/pursuit

Dougall, A., Hyman, K., Hayward, M., McFeeley, S., & Baum, A. (2001). Optimism and traumatic stress: The importance of social support and coping. *Journal of Applied Social Psychology, 31*(2), 223-245.

Durkin, J., & Bekerian, D. (2000). *Psychological resilience to stress in firefighters*. London, UK: Psychology Department, University of East London.

Drucker, P. (2001)*. The essential Drucker*. New York, NY: HarperCollins Publishers.

Drucker, P. (2005). Managing oneself. *Harvard Business Review, 83*(1), 92-99.

Drucker. P. (1999). *Management Challenges for the 21st Century*. New York, NY: HarperCollins Publishing.

Dunne, C. (2011). The place of the literature review in grounded theory research. *International Journal of Social Research Methodology, 14*(2). 111-124.

El Hussein, M., Hirst, S., Salyers, V., & Osuji, J. (2014). Using grounded theory as a method of inquiry: Advantages and disadvantages. *The Qualitative Report, 19* (How To Article 13), 1-15. Retrieved from http://www.nova.edu/ssss/QR/QR19/el-hussein13.pdf

Ellis, B. (2015). Beyond risk and protective factors: Rethinking the role of stress in regulating child development and resilience. Keynote address given at *Pathways to Resilience: Beyond Nature vs. Nurture* conference. Halifax, Nova Scotia. June 17, 2015.

Ellis, B. & del Giudice, M. (2014). Beyond allostatic load: Rethinking the role of stress in regulating human development. Development and Psychopathology, 26, 1-20.

Ellis, B., Jackson, J., Boyce, W. (2006). The stress response system: Universality and adaptive individual differences. *Developmental Review, 26(*2), 175-212.

Erickson, K., Voss, M., Prakash, R., Basak, C., Szabo, A., Chaddock, L.,… Kramer, A. (2010). Exercise training increases size of hippocampus and improves memory. *Proceedings of the National Academy of Sciences (PNAS) 108*(7), 3017-3022.

Eriksson, M., & Lindström, B. (2011). Life is more than survival: Exploring links between Antonovsky's salutogenic theory and the concept of resilience. In K. M. Gow & M. J. Celinski (Eds.), *Wayfinding through life's challenges: Coping and survival* (pp. 31-46). New York: Nova Publishers.

Everly, G., Jr., Flannery, R., Jr., & Mitchell, J. (2000). Critical incident stress management: A review of the literature. *Aggression and Violent Behavior: A Review Journal, 5*, 23-40.

Everly, G., Jr., & Lating, J. (2013). *A Clinical Guide to the Treatment of the Human Stress Response.* 3rd Ed. New York, NY: Springer.

Everly, G., Jr. & Links, A. (2012). Resiliency in high risk groups: A qualitative analysis of law enforcement and elite military personnel. In: D. Paton & J. Violanti (Eds). *Working in High Risk Environments: Developing Sustained Resilience*. pp. 115-123. Springfield, IL: Charles C Thomas.

Everly, G., Jr., & Mitchell, J. (1999). *Critical incident stress management: A new era and standard of care in crisis intervention* (2nd Ed.). Ellicott City, MD: Chevron Publishing.

Everly, G., Jr., Strouse, D., & Everly, G. III. (2010). *The secrets of resilient leadership.* New York, NY: DiaMedica Publishing.

Farnsworth, J. & Sewell, K. (2011). Fear of emotion as a moderator between PTSD and firefighter social interaction. *Journal of Traumatic Stress, 24*(4), 444-450.

Feldbush, M., & Mitchell, J. T. (2010). A time for renewal: A lessons-learned review on the role of CISM in caring for missionaries after the Rwandan genocide. *International Journal of Emergency Mental Health, 12*(1), 51-56.

Figley, C. (2010, April 9). Combat stress injury: A powerpoint presentation. Message posted to http://sites.google.com/site/figleycolleagues/home/csi----injury-not-illness

Fire Service Liaison Group. (2009). *Public safety in British Columbia: Transforming the Fire/Rescue service.* Retrieved August 10, 2015, from http://fslg.ca/

Fleming, J. & Ledogar, R. (2008). Resilience, an evolving concept: A review of the literature relevant to Aboriginal research. *Pimatisiwin, 6*(2), 7-23. Retrieved from PubMed Central Canada: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2956753/pdf/nihms387.pdf

Fletcher, D. & Sarkar, M. (2012). A grounded theory of psychological resilience in Olympic champions. *Journal of Sport and Exercise, 13,* 669-678.

Fletcher, D. & Sarkar, M. (2013). Psychological resilience: A review and critique of definitions, concepts, and theory. *European Psychologist, 18*(1), 12-23.

Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology, 46*(4), 839-852.

Folkman, S., & Moskowitz, J. T. (2004). Coping: Pitfalls and promise. *Annual Review of Psychology, 55*(1), 745-774. doi: 10.1146/annurev.psych.55.090902.14145.

Forgeard, M., Jayawickreme, E., Kern, M., & Seligman, M. (2011). Doing the right thing: Measuring wellbeing for public policy. International Journal of Wellbeing, 1(1), 79-106.

Frankl, V. (1884). *Man's Search for Meaning.* New York, NY: Simon & Schuster Inc.

Fredrickson, B. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist, 56*(3), 218-226.

Fredrickson, B. (2009). *Positivity.* New York, NY: Crown Publishing.

Fredrickson, B. & & Losada, M. (2005). Positive affect and the complex dynamics of human flourishing. *American Psychologist, 60*, 678-686.

Freire, P. (1970). *Pedagogy of the Oppressed.* New York, NY: Herter and Herter.

Freshwater, D., & Rolfe, G. (2001). Critical reflexivity: A politically and ethically engaged research method for nursing. *Nursing Times Research, 6*(1), 526-537.

Friedli, L. (2009). Mental health, resilience, and inequalities. Report prepared for the World Health Organization (WHO) Regional Office for Europe. Copenhagen: WHO. Retrieved from http://www.euro.who.int/__data/assets/pdf_file/0012/100821/E92227.pdf

Gardner, A., Fedoruk, M., & McCutcheon, H. (2013). Discovering constructivist grounded theory's fit and relevance to researching contemporary mental health nursing practice. *Australian Journal of Advanced Nursing, 30*(2), 66-74.

Garland, E., Fredrickson, B., Kring, A., Johnson, D., Meyer, P., & Penn, D. (2010). Upward spirals of positive emotions counter downward spirals of negativity. *Clinical Psychology Review, 30*(7), 849-864.

Garmezy, N. (1971). Vulnerability research and the issue of prevention. *American Journal of Orthopsychiatry, 41*(1), 101-116.

Garmezy, N., & Masten, A. S. (1991). The protective role of competence indicators in children at risk. In E. M. Cummings, A. L. Greene, & K. H. Karraker (Eds.), *Life-span developmental psychology: Perspectives on stress and coping* (pp. 151-174). Hillsdale, NJ: Lawrence Erlbaum Publishers.

Gilbert, M. & Bilsker, D. (2012). *Psychological Health & Safety: An Action Guide for Employers.* Ottawa, ON: Mental Health Commission of Canada.

Glaser, B. (1978). Theoretical sensitivity: Advances in the methodology of grounded theory. Mill Valley, CA: Sociology Press.

Glaser, B. (2004). Remodeling grounded theory. *Forum: Qualitative Social Research, 5*(2), Article 4. Retrieved August 8, 2014 from: http://www.qualitative-research.net/index.php/fqs/article/view/607/1316

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Hawthorne, NY: Aldine de Gruyter.

Government of Canada. (2014). *Service Canada: Firefighters*. Ottawa, ON: Author. Retrieved

from: http://www.servicecanada.gc.ca/eng/qc/job_futures/statistics/6262.shtml

Halpern, J., Gurevich, M., Schwartz, B., & Brazeau, P. (2009). Interventions for critical

incident stress in emergency medical services: A qualitative study. *Stress & Health:*

Journal of the International Society for the Investigation of Stress, 25(2), 139-149.

Halpern, J., Maunder, R., Schwartz, B., & Gurevich, M. (2012). Identifying, describing, and

expressing emotions after critical incidents in paramedics. *Journal of Traumatic*

Stress, 25(February), 111-114.

Halter, M. (2014). *Varcarolis's Canadian Psychiatric Mental Health Nursing.* (1st Canadian

Edition). C. Pollard, S. Ray, & M. Haase (Eds). Toronto, ON: Elsevier Canada.

Hamilton, G. (2016, May 13). Fighting the demon: Inside the heartbreaking battle to save

Fort McMurray. *National Post.* Retrieved from:

http://news.nationalpost.com/news/canada/fighting-the-demon-inside-the-heartbreaking-battle-to-save-fort-mcmurray

Hartfiel, N., Havenhand, J., Khalsa, S., Clarke, G., & Krayer, A. (2011). The effectiveness of

yoga for the improvement of well-being and resilience to stress in the workplace.

Scandinavian Journal of Work, Environment, and Health, 37(1), 70-76.

Hashimoto, Y. & Ohama, A. (2014). The role of social media in emergency response: The case

of the Great East Japan earthquake. *NIDS Journal of Defense and Security, 15*, 99-

126.

Haslam, C., & Mallon, K. (2003). A preliminary investigation of posttraumatic stress

symptoms among firefighters. *Work and Stress, 17*, 277-285.

Hawker, D., Durkin, J., & Hawker, D. (2011). To debrief or not to debrief our heroes: That is

the question. *Clinical Psychology and Psychotherapy, 18*, 455-463.

Haynes, H. & Molis, J. (2015). *US Firefighter Injuries 2014.* NFPA No, FF110. Report. Quincey, MA: National Fire Protection Association.

Hill, R. (2014, November). *Investigating occupation-related consequences for relatives of firefighters.* PowerPoint presentation at RE14 Annual Conference: Fire-related Research and Developments. Moreton-in-Marsh, UK.

Hill, R. & Brunsden, V. (2003). Surviving disaster: Firefighters as victims – preliminary findings*. Fire Safety, Technology, and Management, 8*(3), 21-24.

Hinton, D. & Kirmeyer, L. (2013). Local responses to trauma: Symptom, affect, and healing. *Transcultural Psychiatry, 50*(5), 607-621.

Ho, S., Ho, J., Bonanno, G., Chu, A., & Chan, M. (2010). Hopefulness predicts resilience after hereditary colorectal cancer genetic testing: A prospective outcome trajectories study. *BMC Cancer, 10.* Open Access journal retrieved from: http://www.biomedcentral.com/1471-2407/10/279

Ho, S. & Lo, R. (2012). Dispositional hope as a protective factor among medical emergency professionals: A preliminary investigation. *Traumatology, 17*, 4: 3-9.

Hobfoll, S. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing conservation of resources theory. *Applied Psychology: An International Review, 50*(3), 337-421.

Hobfoll, S. (2002). Social and psychological resources and adaptation. *Review of General Psychology, 6*(4), 307-324.

Hobfoll, S. (2014). Resource caravans and resource caravan pathways: A new paradigm for

trauma responding, *Intervention, 12*, Suppl 1, 21-32.

Hobfoll, S., Stevens, N., & Zalta, A. (2015). Expanding the science of resilience: Conserving

resources in aid of adaptation. *Psychological Inquiry, 26*(2), 174-180.

Holton, J. (2010). The coding process and its challenges. *The Grounded Theory Review, 9*(1),

21-40.

Horowitz, M., Wilner, N., & Alvarez, W. (1979). Impact of Event Scale: A measure of

subjective stress. *Psychosomatic Medicine, 41*(3), 209-218*.*

Huber, M. (2011). Health: How shall we define it? *British Medical Journal, 343* (7817, July

30), 235-237.

Iacoviello, B. & Charney, D. (2014). Psychosocial facets of resilience: Implications for

preventing posttrauma psychopathology, treating trauma survivors, and enhancing

community resilience. *European Journal of Psychotraumatology, 5,* 23970. Open

Access Journal. Retrieved from: http://dx.doi.org/10.3402/ejpt.v5.23970

Idan, O., Braun-Lewensohn, O., & Sagy, S. (2013). Qualitative, sense of coherence-based

assessment of working conditions in a psychiatric inpatient unit to guide salutogenic

interventions. In G. Bauer & G. Jenny (Eds). *Salutogenic Organizations and Change:

The Concepts Behind Organizational Health Intervention Research.* pp. 55-74. New

York, NY: Springer.

International Association of Firefighters. (2016). *Wellness Fitness Initiative*.

http://client.prod.iaff.org/#contentid=8863

Jackson, D., Firtko, A., & Edenborough, M. (2007). Personal resilience as a strategy for

surviving and thriving in the face of workplace adversity: A literature review. *Journal of

Advanced Nursing, 60*(1), 1-9.

James, K. (2010). Incorporating complexity science theory into nursing. *Creative Nursing,*

16(3), 137-142.

Jeannette, J. M., & Scoboria, A. (2008). Firefighter preferences regarding post-incident intervention. *Work & Stress, 22*(4), 314-326.

Johnson, J. (2010). Understanding differences in stress and coping between full-time and paid-on-call firefighters. PhD dissertation. Accessed from Proquest. UMI 3428172.

Johnson, J., Minami, T., Greenwald, D., Li, C., Reinhardt, K., & Khalsa, D. (2015). Yoga for military personnel with PTSD: a single arm study. *Psychological Trauma: Theory, Research, Practice, and Policy, 7*(6), 555-562.

Jorgenson, I. & Nafstad, H. (2008). Positive psychology: Philosophical and epistemological perspectives. In: P. Linley & S. Joseph (Eds). *Positive Psychology in Practice* (pp. 15-34). Hoboken, NJ: John Wiley & Sons.

Joseph, S. (2015). Applied positive psychology 10 years on. In *Positive Psychology in practice: Promoting human flourishing in work, health, education, and everyday life.* 2nd Edition. S. Joseph (Ed). pp 1-8. Hoboken, NJ: John Wiley & Sons.

Joseph, S. (2011). What doesn't kill us: The new psychology of posttraumatic growth. Philadelphia, PA: Basic Books.

Juster, R., McEwen, B., & Lupien, S. (2010). Allostatic load biomarkers of chronic stress and impact on health and cognition. *Neuroscience Biobehavioral Reviews, 35*, 2-16.

Karter, M. Jr. & Stein, G. (2013). US Fire Department Profile. Report prepared for the National Fire Protection Association, Quincy, MA. Retrieved August 21, 2014 from: http://www.nfpa.org/research/reports-and-statistics/the-fire-service/administration/us-fire-department-profile

Kauffman, S. (2014). *At Home in the Universe: The Search for the Laws of Self-Organization and Complexity*. Retrieved from http://www.eblib.com

Kelley, M. (writer, host). (2015, Nov 6). The fire within: The secret battle of female

    firefighters. In L. Guerriero (Producer/Director) and L. Mayor (Associate Producer).

    The Fifth Estate. Canada: CBC Television.

Kitchenham, A. (2009). The evolution of John Mezirow's transformative learning theory.

    Journal of Transformative Education, 6(2), 104-123.

King, A. (2016). Neurobiology: Rise of resilience, *Nature, 531,* 528-519.

Kolar, K. (2011). Resilience: Revisiting the concept and its utility for social research.

    International Journal of Mental Health Addiction, 9, 421-433.

Kouzes, J. & Posner, B. (2012). The leadership challenge: How to make extraordinary things

    happen in organizations. 5th Ed. San Francisco, CA: Jossey-Bass.

Kramer, A., Erickson, K., & Colcombe, S. (2006). Exercise, cognition, and the aging brain.

    Journal of Applied Physiology, 101, 1237-1242.

Kulig, J. (2001). Hope at the community level according to rural-based public health nurses.

    Online Journal of Rural Nursing and Health, 2, 1-19.

Labonte, R. (1989). Community and professional empowerment. *The Canadian Nurse,*

    (March), 23-28.

Lansing, J. (2003). Complex adaptive systems. *Annual Review of Anthropology, 32,* 183-204.

Lawrence, L. & & Barber, G. (2004). Debriefing in the fire service. *Counselling at Work,*

    Winter, 11-13.

Lawrence-Lightfoot, S. & Davis, J. (1997). *The Art and Science of Portraiture.* San Francisco,

    CA: John Wiley and Sons.

Lazarus, R. S. (1991). Progress on a cognitive-motivational-relational theory of emotion.

    American Psychologist, 46(8), 819-834.

Lazarus, R. & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer.

Leonhardt, J. & Vogt, J. (2011). Critical incident stress and the prevention of psychological trauma in air traffic controllers. In: N. Tehrani (Ed). *Managing trauma in the workplace*. New York, NY: Routledge.

Lester, R. (2013). Back from the edge of existence: A critical anthropology of trauma. *Transcultural Psychiatry, 50*(5), 753-762.

Lewis, C., Tenzer, M., & Harrison, T. (1999). The heroic response to terror: The case of Oklahoma City. *Public Personnel Management, 28*(4), 617-635.

Lindström, B & Eriksson, M. (2006). Contextualizing salutogenesis and Antonovsky in public health development. *Health Promotion International, 21*(3), 238-244.

Linley, P. A. (2015). Best practices for finding hidden talent and empowering social mobility. *Strategic HR Review, 14*(5), 194 - 198

Linley, P. A. & Joseph, S. (2012). Toward a theoretical foundation for positive psychology in practice. In P. A. Linley, & S. Joseph (Eds.), *Positive psychology in practice* (pp. 713-731). Hoboken, NJ: John Wiley & Sons.

Linley, P. A. & Joseph, S. (2004). Toward a theoretical foundation for positive psychology in practice. In *Positive Psychology in Practice.* P.A. Linley & S. Joseph (Eds). pp 713-731. Hoboken, NJ: John Wiley & Sons.

Loiselle, C. & Profetto-McGrath, J. (Eds). 2011. *Canadian Essentials of Nursing Research* (3rd Ed). Philadelphia, PA: Wolters Kluwer.

Lucianno, M. (2014). Proposals for ICD-11: A report for WPA membership. *World Psychiatry, 13*, 206–208.

Luthans, F., Avey, J., Avolio, B., Norman, S., & Combs, G. (2006). Psychological capital development: Toward a micro-intervention. *Journal of Organizational Behaviour, 27,*

387-393.

Luthans, F. & Youssef, C. (2007). Emerging positive organizational behavior. *Journal of Management, 33*(3), 321-349.

Luthans, F. & Youssef-Morgan, C. (2015). Psychological capital and well-being. *Stress and Health, 31,* 180-188.

Luthar, S. (1993). Annotation: Methodological and conceptual issues in the study of resilience. *Journal of Child Psychology and Psychiatry, 34*, 441–453.

Luthar, S. & Cicchetti, D. (2000). The construct of resilience: Implications for interventions and social policies. *Developmental Psychopathology, 12*(4), 857-885.

Luthar, S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development, 71*(3), 543-562.

MacNeill, N., Cavanagh, R., & Reynolds, P. (2009). The E-interview: Asynchronous data collection in schools. Peer reviewed paper presented at AARE Annual Conference, National Convention Centre, Canberra, Australia. November. Retrieved from: http://www.aare.edu.au/data/publications/2009/mac091074.pdf

Maddi, S. R. (2005). On hardiness and other pathways to resilience. *American Psychologist, 60*(3), 261-262.

Malek, M.D., Mearns, K., & Flin, R. (2010). Stress and psychological well-being in UK and Malaysian fire fighters*. Cross Cultural Management: An International Journal, 17*(1), 50 – 61.

Mancini, A. & Bonanno, G. (2009). Predictors and parameters to resilience: Towards an individual differences model. *Journal of Personality, 77*(6), 1805-1831.

Masten, A. (2015, June). *Resilience in human development: Interdependent adaptive*

systems in theory and action. Keynote address given at the Pathways to Resilience III conference. Halifax, NS.

Masten, A. (2014). Global perspectives on resilience in children and youth. *Child Development, (85)*, 1, 6-20.

Masten, A. (2001). Ordinary magic: Resilience processes in development. *American Psychologist, 56*(3), 227-238.

Masten, A. (1994). Resilience in individual development: Successful adaptation despite risk and adversity. In Wang, M. C. and Gordon, G. W. (Eds.) *Educational resilience in inner-city America*. Hillsdale, New Jersey: Lawrence Erlbaum Associates, Inc.

Masten, A. & Narayan, J. (2012). Child development in the context of disaster, war, and terrorism: Pathways of risk and resilience. *Annual Review of Psychology, 63*, 227-257.

Masten, A. & Obradovic, J. (2006). Competence and resilience in development. *Annals of the New York Academy of Science,* 1094, 13-27.

Maulding, W., Peters, G., Roberts, J., Leonard, E., & Sparkman, L. (2013). Emotional intelligence and resilience as predictors of leadership in school administrators. *Journal for Leadership Studies, 5*(4), 20-29.

Maunder, R., Leszcz, M., Savage, M., Savage, D., Adam, M., Peladeau, N., . . . Schulman, B. (2008). Applying the lessons of SARS to pandemic influenza. *Canadian Journal of Public Health, 99*(6), 486-488.

Mayan, M. (2009). *Essentials of Qualitative Inquiry*. Walnut Creek, CA: Left Coast Press.

McAllister, M. & McKinnon, J. (2009). The importance of teaching and learning resilience in the health disciplines: A critical review. *Nurse Education Today, 29,* 371-379.

McCann, T. & Clark, E. (2003a). Grounded theory in nursing research: Part 1 – methodology. *Nurse Researcher, 11*(2), 7-17.

McCann, T. & Clark, E. (2003b). Grounded theory in nursing research: Part 2 – critique. *Nursing Researcher, 11*(2), 19-28.

McMahon, C. (2010). *A Phenomenological Study of Stress and Coping in the Fire Service.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (UMI number: 3410314)

McNab, S. (2011). One disaster after another. In: N. Tehrani (Ed). *Managing Trauma in the Workplace: Supporting Workers and Organisations* (pp. 273-297). New York: NY: Mc Routledge.

McNally, R., Bryant, R., & Ehlers, A. (2003). Does early psychological intervention promote recovery from posttraumatic stress? *Psychological Science in the Public Interest, 4*(2), 45-79.

Meffert, U. (n.d.) *Gear Ball.* [Rotating puzzle]. Meffert's Puzzles and Games. http://www.mefferts.com/

Mental Health Commission of Canada. (2013a). *Guidelines for the Practice and Training of Peer Support.* Available from: http://www.mentalhealthcommission.ca/sites/default/files/peer_support_guidelines.pdf.pdf

Mental Health Commission of Canada. (2013b). *National Standard of Canada for Psychological Health and Safety in the Workplace*. Available from: http://www.mentalhealthcommission.ca/English/national-standard

Mental Health Commission of Canada. (2013c). *Psychological health and safety in the workplace — Prevention, promotion, and guidance to staged implementation.* National Standard of Canada: CAN/CSA-Z1003-13/BNQ 9700-803/2013. Toronto, ON: Canadian

Standards Association (CSA Group). Retrieved from:

http://www.mentalhealthcommission.ca/English/issues/workplace/national-standard

Merton, D. (2015). Transformative mixed methods research. Workshop presented at

Pathways to Resilience: Beyond Nature vs. Nurture conference. Halifax, Nova Scotia.

June 16, 2015.

Mezirow, J. (2006). An overview of transformative learning. In: P. Sutherland & J. Crowther

(Eds). *Lifelong Learning: Concepts and Contexts*. (pp. 24-38). New York, NY: Routledge.

Miller, J. (2002). Affirming flames: Debriefing survivors of the world trade center attacks.

Brief Treatment and Crisis Intervention, 2(1), September 10, 2010-85-94.

Miller-Karas, E. (2015). *Building resilience to trauma*. New York, NY: Routledge.

Mills, J., Bonner, A., & Francis, K. (2006a). Adopting a constructivist approach to grounded

theory: Implications for research design. *International Journal of Nursing Practice,
12*(1), 8-13.

Mills, J., Bonner, A., & Francis, K. (2006b). The development of constructivist grounded

theory. *International Journal of Qualitative Methods, 5*(1), Article 3. Retrieved June

1, 2014 from http://www.ualberta.ca/~iiqm/backissues/5_1/pdf/mills.pdf

Mitchell, J. (1983). When disaster strikes … The critical incident stress debriefing process.

Journal of Emergency Medical Services, *13*(11), 49 – 52.

Money, N., Moore, M., Brown, D., Kasper, K., Roeder, J., Bartone, P., & Bates, M. (2011). *Best

Practices Identified for Peer Support Programs: White Paper.* Silver Springs, MD:

Defense Centers for Excellence in Psychological Health and Traumatic Brain Injury

(DCoE). Accessed from:

http://www.dcoe.mil/content/Navigation/Documents/Best_Practices_Identified_for

_Peer_Support_Programs_Jan_2011.pdf

Morse, J. (2012). Qualitative health research: Creating a new discipline. Walnut Grove, CA:
    Left Coast Press.

Morse, J., & Niehaus, L. (2009). *Mixed method design: Principles and procedures*. Walnut
    Creek, CA: Left Coast Press.

Mosselson, J. (2010). Subjectivity and reflexivity: Locating the self in research on dislocation.
    International Journal of Qualitative Studies in Education, 23(4), 479-494.

Munhall, P. (2012). *Nursing research: A qualitative perspective.* (5th Edition, pp. 1-94).
    Mississauga, ON: Jones and Bartlett Learning.

Murphy, D., Durkin, J., & Joseph, S. (2011). Growth in relationship: A post-medicalized vision
    for positive transformation. In N. Tehrani (Ed). *Managing Trauma in the Workplace.*
    pp. 267-283. New York, NY: Routledge.

National Fire Protection Association. (2015). *About NFPA.* National Fire Protection
    Association website. Retrieved from: http://www.nfpa.org/about-nfpa

National Institute for Clinical Excellence (NICE). (2015, June). *Clinical guideline 26: Post-
    traumatic stress disorder (PTSD)*. National Institute for Clinical Excellence. Retrieved
    from: https://www.nice.org.uk/guidance/cg26

Neuman, B., & Fawcett, J. (2011). *The Neuman Systems Model* (5th Ed.). Upper Saddle River,
    NJ: Pearson.

Nightingale, F. (1859). *Notes on Nursing.* Originally printed by Harrison & Sons, London.
    Reprinted as a Commemorative Edition, 1992, David Carroll, Editor. Philadelphia, PA:
    Lippincott Williams & Wilkins.

Noblet, A., & LaMontagne, A. (2006). The role of workplace health promotion in addressing

   job stress. *Health Promotion International, 21*(4), 346-353.

Noltemeyer, A. & Bush, K. (2013). Adversity and resilience: A synthesis of international

   research. *School Psychology International, 34*(5), 474-487.

Nucifora, F., Jr, Langlieb, A. M., Siegal, E., Everly, G. S., Jr, & Kaminsky, M. (2007). Building

   resistance, resilience, and recovery in the wake of school and workplace violence.

   Disaster Medicine and Public Health Preparedness, 1(1), S33-S37.

Office of the Fire Commissioner. (2015). *Structure Firefighters Competency and Training

   Playbook – British Columbia Fire Service Minimum Training Standards.* Vancouver, BC:

   Author. Retrieved from: http://www2.gov.bc.ca/assets/gov/public-safety-and-
emergency-services/emergency-preparedness-response-recovery/embc/fire-
safety/playbook.pdf

Panter-Brick, C. (2014). Health, risk, and resilience: Interdisciplinary concepts and

   applications. *Annual Review of Psychology,* 43: 431-448.

Panter-Brick, C. & Eggerman, M. (2012). Understanding culture, resilience, and mental

   health: The production of hope. In M. Ungar (Ed). *The Social Ecology of Resilience: A

   Handbook of Theory and Practice* (p. 369-386). New York, NY: Springer.

Paparone, C., Anderson, R., & McDaniel, R. (2008). Where military professionalism meets

   complexity science. *Armed Forces and Society, 34*(3), 443-449.

Park, C. (2010). Making sense of the meaning literature: An integrative review of meaning

   making and its effects on adjustment to stressful life events. *Psychological Bulletin,

   136*(2), 257-301.

Paton, D., Smith, L., & Stephens, C. (1998). Work-related psychological trauma: A social

   psychological and organizational approach to understanding response and recovery.

Australasian Journal of Disaster and Trauma Studies (1). Online journal. Accessed from: http://www.massey.ac.nz/~trauma/issues/1998-1/paton1.htm

Paton, D., Violanti, J., & Smith, L. (2003). Promoting Capabilities to Manage Posttraumatic Stress: Perspective on Resilience. Springfield, IL: Charles C. Thomas.

Paton, D., Violanti, J., Johnston, P., Burke, K., Clarke, J., & Keenan, D. (2008). Stress shield: A model of police resiliency. *International Journal of Emergency Mental Health, 10*(2), 95-108.

Pender, N., Murdaugh, C., & Parsons, M. A. (2011). *Health promotion in nursing practice* (6th ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Peplau, H. (1992). Notes on Nightingale. *Notes on Nursing.* Commemorative Edition. David Carroll, Editor. Philadelphia, PA: Lippincott Williams & Wilkins.

Penz, K. & Dugglby, W. (2011). Harmonizing hope: A grounded theory study of the experience of hope of registered nurses who provide palliative care in community settings. *Palliative and Supportive Care, 9,* 281-294.

Pietrantoni, L. & Prati, G. (2008). Resilience among first responders. *African Health Sciences, 8*, Special Issue, S14-S20.

Powell, S., Rosner, R., Butollo, W., Tedeschi, R., & Calhoun L. (2003). Posttraumatic growth after war: A study with former refugees and displaced persons in Sarajevo. *Journal of Clinical Psychology, 59*(1), 71-83.

Regehr, C. (2005). Bringing the trauma home: Spouses of paramedics. *Journal of Loss and Trauma, 10*(2), 97-114.

Regehr, C. (2009). Social support as a mediator of psychological distress in firefighters. *Irish Journal of Psychology, (30)*1-2, 87-98.

Regehr, C., Dimitropoulos, G., Bright, E., George, S., & Henderson, J. (2005). Behind the

    brotherhood: Rewards and challenges for wives of firefighters. *Family Relations, 5*(3),

    423-435.

Regehr, C., Goldberg, G., & Hughes, J. (2002). Exposure to human tragedy, empathy, and

    trauma in ambulance paramedics. *American Journal of Orthopsychiatry, 72*(4), 505-

    513.

Regehr, C., Hill, J., Knott, T., & Sault, B. (2003). Social support, self-efficacy and trauma in

    new recruits and experienced firefighters. *Stress and Health, 19,* 189-193.

Richardson, G. (2002). The metatheory of resilience and resiliency. *Journal of Clinical*

    Psychology, 58(3), 307-321.

Richardson, G. (2012). *Research summary*. Retrieved from University of Utah Faculty Activity

    Website: https://faculty.utah.edu/u0032514-

    GLENN_E_RICHARDSON,_PhD/research/index.hml

Riley, J. R., & Masten, A. S. (2005). Resilience in context. In R. Peters, B. Leadbeatter, & R.

    McMahon (Eds.), *Resilience in children, families, and communities: Linking context to*

    practice and policy (pp. 13–25). New York, NY: Kluwer Academic/Plenum

Robertson, I., Cooper, C., Sarkar, M., & Curran, T. (2015). Resilience training in the workplace

    from 2003 to 2014: A systematic review. *Journal of Occupational and Organizational*

    Psychology, 88, 533-562. doi: 10.1111/joop.12120

Robinson, M., Raine, G., Robertson, S., Steen, M., & Day, R. (2005). Peer support as a

    resilience building practice with men. *Journal of Public Mental Health, 14*(4), 196-204.

Robinson-Kitt, L. (2010). Breaking the silence: Insights into the impact of being a firefighter

    on men's mental health. PhD dissertation. Accessed from UBC Theses and

Dissertations, Open Collection:

https://open.library.ubc.ca/cIRcle/collections/ubctheses/24/items/1.0053826

Rogers, Carl. (1961). *On becoming a person*. Boston, MA: Houghton Mifflin.

Rootman, I. & O'Neill, M. (2012). Key concepts in health promotion. In: I. Rootman, S. Dupere, A. Pederson, & M. O'Neill (Eds). *Health Promotion in Canada: Critical Perspectives on Practice.* (3rd Ed). Toronto, ON: Canadian Scholars Press.

Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry, 57*(3), 316-331.

Rutter, M. (1999). Resilience concepts and findings: Implications for family therapy practice. *Journal of Family Therapy, 21,* 119-144.

Rutter, M. (2012). Resilience: Causal pathways and social ecologies. In: M. Ungar (Ed). *The Social Ecology of Resilience: A Handbook of Theory and Practice.* (pp. 33-42). New York, NY: Springer.

Sagy, S., Eriksson, M., & Braun-Lewensohm, O. (2015). The salutogenic paradigm. In: S. Joseph (Ed). Positive psychology in practice (2nd Ed). Hoboken, NJ: John Wiley and Sons.

Schellenberg, K. (2011). The life of volunteer firefighters. Posted to *The Fire Within* blog: http://www.thefirewithin.ca/blog/?p=70

Schiraldi, G., Jackson, T., Brown, S., Jordan, J. (2010). Resilience training for functioning adults: Program description and preliminary findings from a pilot investigation. *International Journal of Emergency Mental Health, 12*(2), 117-130.

Schmidt, U. (2015). A plea for symptom-based research in psychiatry. *European Journal of Psychotraumatology 2015, 6*: 27660. Open access, retrieved from: http://dx.doi.org/10.3402/ejpt.v6.27660

Schneider, M. & Somers, M. (2006). Organizations as complex adaptive systems: Implications of complexity theory for leadership research. *The Leadership Quarterly, 17,* 351-165.

Schon, D. A. (1987). Educating the reflective practitioner: Toward a new design for teaching and learning in the professions. San Francisco: Jossey-Bass.

Seligman, M. (2002). *Authentic happiness: Using the new positive psychology to realize your potential for lasting fulfilment.* New York, NY: Free Press.

Seligman, M. (2011). *Flourish.* New York, NY: Atria Paperback.

Seligman, M., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*(1), 5-14.

Seligman, M., Ernst, R., Gillham, J., Reivich, K., & Linkins, M. (2009). Positive education: Positive psychology and classroom interventions. *Oxford Review of Education, 35*(3), 293-311.

Seligman, M., Peterson, C., Barsky, A., Boehm, J., Kubzansky, L., Park, N., & Labarthe, D. Positive Psychology Center. (2013). *Positive health and health assets: Re-analysis of longitudinal datasets.* Whitepaper. Philadelphia, PA: University of Pennsylvania. Accessed from

http://positivehealthresearch.org/sites/positivehealthresearch.org/files/PH_Whitepaper_Layout_Web.pdf

Seligman, M., Steen, T., Park, N., & Peterson, C. (2005). Positive psychology progress. *American Psychologist, 60*(5), 410-421.

Selye, H. (1936). A syndrome produced by diverse noxious agents. *Nature, 138* (3479). doi: 10.1035/138032a0

Selye, H. (1980). *Selye's Guide to Stress Research.* H. Selye (Ed.). New York, NY: Van Nostrand Reinhold.

Senge, P. (2006). The fifth discipline: The art and practice of the learning organization. Toronto, ON: Doubleday.

Shakespeare-Finch, J. (2011). How emergency service workers cope with, and grow from, work-related stress and trauma. In: *Wayfinding through Life's Challenges.* K. Gow & M. Celinski (Eds). Hauppauge, NY: Nova Science Publishers Inc.

Shakespeare-Finch, J., Paton, D., & Violanti, J. (2003). The family: Resilience resource and resilience needs. In: D. Paton, J. Violanti, and L. Smith (Eds). Promoting Capabilities to Manage Posttraumatic Stress: Perspective on Resilience. pp. 170-185. Springfield, IL: Charles C. Thomas.

Shaw, R. (2010). Embedding reflexivity within experiential qualitative psychology. Qualitative Research in Psychology, 7(3), 233-243.

Shelov, D, Suchday, S., & Friedberg, J. (2009). A pilot study measuring the impact of yoga on the trait of mindfulness. *Behavioral and Cognitive Psychotherapy, 31*(5), 595-598.

Shaver, P., Schwartz, P., Kirson, J., & O'Connor, C. (2001). Emotional knowledge: Further exploration of prototype approach. In: G Parrott (Ed). *Emotions in Social Psychology: Essential Readings.* pp. 26-56. Philadelphia, PA: Psychology Press.

Shepherd, G. (2005). *The advocates and adversaries of post traumatic stress disorder debriefing: A lesson for all.* Unpublished Baccalaureate thesis. Sunderland, UK: University of Sunderland.

Sliter, M., Kale, A., & Yuan, Z. (2014). Is humor the best medicine? The buffering effect of coping humor on traumatic stressors in firefighters. *Journal of Organizational Behavior, 35,* 257-272.

Smith, B., Ortiz, J., Steffen, L., Tooley E., Wiggins, K., Yeater, E., Montoya, J., Bernard, M. (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.

Snyder, C. (2000). *Handbook of hope: Theory, measure, and application*. San Francisco, CA: Academic Press.

Southwick, S., Bonanno, G*.,* Masten, A., Panter-Brick, C., & Yehuda, R. (2014a). Resilience definitions, theory, and challenges: Interdisciplinary perspectives. *European Journal of Psychotraumatology, 5.* 10.3402/ejpt V5 25338. http://doit.org/a0.3402/ejptv5.25338

Southwick, S., Douglas-Palumberi, H., Pietrzak, R. (2014b). Resilience. In M. Friedman & T. Keane (Eds). *Handbook of PTSD,* 2nd Ed. (pp. 590-606). New York, NY: Guildford.

Southwick, S., Litz, b., Charney, D., & Friedman, M. (Eds). (2011). Resilience and mental health: Challenges across the lifespan. (pp. xi-xv). Cambridge, UK: Cambridge University Press.

Strauss, A. & Corbin, J. (1994). Grounded theory methodology: An overview. In N. K. Denzin, & Y. S. Lincoln (Eds.) *The Sage handbook of qualitative research* (pp. 273-285). Thousand Oaks, CA: Sage.

Sullivan, H. (1953). *Interpersonal theory in psychiatry.* New York, NY: W.W.Norton.

Summerfield, D. (1999). A critique of seven assumptions behind psychological trauma programmes in war-affected areas. *Social Science and Medicine, 48*(10), 1449-1462.

Sunderland, K. & Mishkin, W., Peer Leadership Group, Mental Health Commission of Canada. (2013). *Guidelines for the Practice and Training of Peer Support.* Calgary, AB: Mental Health Commission of Canada. Retrieved from: http://www.mentalhealthcommission.ca/

Tabassum, F., Mohan, J., & Smith, P. (2016). Association of volunteering with mental well-being: A lifecourse analysis of a national population-based longitudinal study in the UK. *BMOJ Open, 6*(6), eo11327. Retrieved from: http://bmjopen.bmj.com/content/6/8/e011327

Tedeschi, R. & Calhoun, L. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress, 9*(3), 455-479.

Tehrani, N. (2011). Building resilient organizations in a complex world. In: N. Tehrani (Ed.) *Managing trauma in the workplace.* New York, NY: Routledge.

Thornberg, R. (2012). Informed grounded theory. *Scandinavian Journal of Educational Research, 56*(3), 243-259.

Thornberg, R. & Charmaz, K. (2012). Grounded theory. In S. Lapan, M. Quartaroli, & F. Reimer (Eds): *Qualitative research: An introduction to methods and designs* (pp. 41-67). San Francisco, CA: Jossey-Bass.

Tugade, M. & Fredrickson, B. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology, 86*(2), 320–333.

Tusaie, K., & Dyer, J. (2004). Resilience: A historical review of the construct. *Holistic Nursing Practice, 18*(1), 3-8.

Uhl-Bien, M. (2012). Complexity leadership in healthcare organizations. Podcast: Plexus Institute *PlexusCalls* broadcast Nov. 1, 2012. Accessed from: http://c.ymcdn.com/sites/www.plexusinstitute.org/resource/resmgr/files/complexity_leadership_plexus.pdf

Uhl-Bien, M. & Marion, R. (Eds.) (2008). *Complexity Leadership part 1: Conceptual Foundations.* Charlotte, NC: IAP, Information Age Publishing.

Ungar, M. (2008). Resilience across cultures. *British Journal of Social Work, 38*(2), 218-235.

Ungar, M. (2011). The social ecology of resilience: Addressing contextual and cultural
ambiguity of a nascent construct. American Journal of Orthopsychiatry, 81(1), 1-17.

Ungar, M. (2012a). The social ecology of resilience: A handbook of theory and practice. (2nd
Ed). New York, NY: Springer.

Ungar, M. (2012b). Researching resilience across cultures. *Preventative Medicine,* 55, 387-
389.

Van Emmerik, A., Kamphuis, J., Hulsbosch, A., & Emmelkamp, P. (2002). Single session
debriefing after psychological trauma: A meta-analysis. *Lancet, 360*, 766-771.

Vancouver Island Health Authority (VIHA). (2014). *Consolidated financial statements – year
end March 31, 2014.* Victoria, BC: Author. Retrieved August 2, 2014 from the VIHA
website http://www.viha.ca/NR/rdonlyres/B7B92DB6-C0EA-4F3F-
B14924E836A403C3/0/Financial_Statements_20132014.pdf

Wagner, D., Heinrichs, M., & Ehlert, U. (1998). Prevalence of symptoms of posttraumatic
stress disorder in German professional firefighters. *American Journal of Psychiatry, 155*,
1727-1732.

Wagner, S., McFee, J., & Martin, C. (2010). Mental health implications of fire service
membership. *Traumatology, 16*(2), 26-32.

Wagnild, G. (2009). A review of the resilience scale. *Journal of Nursing Measurement, 17*(2),
105-113.

Wagnild, G. (2010). In Guinn P. (Ed.). *The resilience scale user's guide* (2.05th Ed.). Worden,
Montana: Resilience Center.

Wagnild, G., & Young, H. (1993). Development and psychometric evaluation of the resilience
scale. *Journal of Nursing Scholarship, 1*(2), 165-178.

Waldrop, M. (1992). Complexity: the emerging science at the edge of order and chaos. New

York, NY: Simon and Schuster.

Warelow, P., & Edward, K. (2007). Caring as a resilient practice in mental health nursing. *International Journal of Mental Health Nursing, 16*, 132-135.

Watson, J. (2009*). Assessing and Measuring Caring in Nursing and Health Sciences.* (2ⁿᵈ Ed). New York, NY: Springer.

Waugh, C., Thompson, R., & Gotlib, I. (2012). Flexible emotional responsiveness in trait resilience. *Emotion, 11(*5), 1059-1067.

Weburg, D. (2012). Complexity leadership: A healthcare imperative. *Nursing Forum, 47*(4), October-December, 268-277.

Williams, C. & Garland, A. (2002). Identifying and challenging unhelpful thinking. *Advances in Psychiatric Treatment, 8,* 377-386.

Woodrow, B. (2011). *A cautionary note on comparative world fire statistics and specifically the case of the Russian Wildfire Statistics, 27*, 14-27. Accessed from: https://www.genevaassociation.org/media/186453/ga2011-wfs27-woodrow3.pdf

World Health Organization (WHO). (1946). *Constitution.* Geneva, Switzerland: Author.

World Health Organization (WHO). (1986). *Ottawa Charter for Health Promotion.* Ottawa: Canadian Public Health Association.

World Health Organization (WHO). (2009). *Milestones on health promotion: Statements from global conferences*. Geneva, Switzerland: Author.

World Health Organization (WHO). (2013. *Guidelines for the management of conditions specifically related to stress.* Geneva, Switzerland: Author.

World Health Organization (WHO). (2014, August). *Mental health: Strengthening mental health promotion. Fact sheet no. 220.* Geneva, Switzerland: Author. Accessed from http://www.who.int/mental_health/emergencies/stress_guidelines/en/

Wright, T. (2003). Positive organizational behavior: An idea whose time has truly come. *Journal of Organizational Behavior, 24*(4), 437-442.

Wright, T. & Quick, J. (2009). The emerging positive agenda in organizations: Greater than a trickle, but not yet a deluge. *Journal of Organizational Behavior, 30,* 147-159.

Wuest, J. (2012). Grounded theory: The method. In P. Munhall *Nursing research: A qualitative perspective.* (5th Edition, pp. 225-256). Mississauga, ON: Jones and Bartlett Learning.

Yehuda, R., Daskalakis, N., Desarnaud, F., Makotkine, I., Lehrner, A., Koch, E., Flory, J., Buxbaum, J., Meaney, M., & Bierer, L. (2013). Epigenetic biomarkers as predictors and correlates of symptom improvement following psychotherapy in combat veterans with PTSD. *Frontiers in Psychiatry*, *4,* September, 118-132.

Youssef, C. & Luthans, F. (2007). Positive organizational behavior in the workplace: The impact of hope, optimism, and resilience. *Journal of Management, 33*(5), 774-800.

Youssef-Morgan, C. & Luthans, F. (2015). Psychological capital and well-being. *Stress and Health, 31*, 180-188.

Yukl, G. (2002). *Leadership in organizations*. 5th Ed. Upper Saddle River, NJ: Prentice-Hall.

APPENDIX I   SUMMARY OF RESILIENCE DEFINITIONS

Summary of definitions of resilience from leaders in the field

Leading voices in the field of resilience	Discipline	Context/culture of resilience research	Extant Definitions	Major tenets of the leaders' resilience perspectives
Garmezy	Clinical psychology	Children of parents with mental illness	A "process of, or capacity for, or the outcome of successful adaptation despite challenging and threatening circumstances" (Garmezy & Masten, 1991, p. 459)	Noted the central element of resilience is in the individual's capacity for recovery & ability return to pre-trauma capacity/adaptation. Looked at factors such as cognitive skills, motivation and other 'protective factors' that might hold clues to preventing mental illness; studied from a pathology (or absence thereof) perspective.
Rutter	Child psychiatry	Children of parents with mental illness; more recently laboratory studies with monkeys	"[The] relative resistance to environmental risk experiences, the overcoming of stress or adversity, or a relatively good outcome despite risk experiences" (Rutter, 2012, p. 34)	Initially focused on pathogenesis and the absence of psychopathology, and allied closely with Garmezy's perspectives. Focused on physical and psychological risks and protective factors More recently, explores resilience from the developmental perspective however notes the heterogeneity of responses to stressors. Suggested the 'steeling' effects of adversity – allowing for inoculation against negative adjustments to stressors. More recent work focuses on biomedicine and factors of pathology – laboratory studies with monkeys; Warned against reductionism in the study of resilience (1999).
Luthar, Cicchetti, & Becker	Clinical & developmental psychology	Developmental psychopathology in children and	"dynamic process encompassing positive adaptation within the context of significant adversity"	Advocates for the exploration of mechanisms that mediate resilience. Early advocates of multidisciplinary integrated

		families	(Luthar et al., 2000, p. 543).	research, promoting the study of various biological, psychological, and social pathways and context-specific factors that result in resilience. Luthar and Cicchetti (2000) applied findings to intervention and policy, offering concrete examples of resilience programs. Also provided guiding principles for future research related to the complexity of the resilience construct; Showed the potential for resilience research and correlated it to positive psychology. Inquired into resilience as a key variable in health and health promotion.
Richardson	Health sciences, health promotion	Individuals, families, organizations, and communities	Did not initially 'define' resilience, but developed a metatheory of resilience and resiliency in 2002. More recently (2012) defines resilience as: "an innate force that progressively drives and guides people to increase their capacities by receiving infusions of desired qualities and virtues"	Developed a metatheory of resilience (2002), building on three "waves" of resilience exploration; showed relationships between various levels of reintegration including 'resilient re-integration' (2nd wave) of growth/change. Relationships in the theory were one-way rather than bidirectional. In contrast to others, suggested resiliency is a process, and resilience is a set of qualities in contrast to other researchers. Considered the complexity of resilience noting the challenges associated with researching and articulating the construct. Noted the paradigm shift from examining psychopathology and risk to looking at strengths, capacities and characteristics of people Metatheory provided a start-point for more in-depth discussion and research into the how resilience is understood and conceptualized.
Masten	Clinical psychology	Children, youth Explored school success in	The "capacity of a dynamic system to adapt successfully to disturbances that threaten the	Takes a developmental approach to risk and resilience focusing on adaptation and competence.

		disadvantaged and homeless youth	viability, the function or the development of that system" (2014, p. 6) Individual resilience "a pattern over time, characterized by good eventual adaptation despite developmental risk, acute stressors, or chronic adversities." (Masten, 1994, p. 3)	More recently (2012, 2014), looks beyond individual resilience and considers individual resilience in the context of community. Noted the 'ordinary magic' (1994) of resilience – the commonality of resilience outcomes (vs. prior conceptualizations of pathology as the common and expected outcome). Differentiates between *resilience* and *resiliency*. Noted the current '4th wave' of resilience research - an integrative transactional approach that considers neurobiological factors, and recognizes individual factors and contexts that support resilience. Advocates global engagement with multiple systems, disciplines, and analysis in order to better understand resilience. Recognizes 'pathways' to resilience.
Wagnild	Nursing, social work	Older women following a major life event; children, adolescents; cross-cultural: American and European populations	Resilience is the capacity to live with purpose, perseverance, equanimity, authenticity, and self-reliance. "resilience, connotes emotional stamina and has been used to describe persons who display courage and adaptability in the wake of life's misfortunes."	Five characteristics constitute a 'resilience core' allowing adaptation or positive response to life's adversities. One of the first references (1990) to resilience as a likely outcome following adversity. In line with health and health promotion; also focuses on adult populations facing various potentially traumatic experiences that may be chronic but may also be acute. Developed the Resilience Scale which has shown validity and reliability across contexts and cultures, and has been administered by multiple disciplines such as nursing, psychology, education.
Antonovsky	Medical sociology	Menopausal women survivors of the Holocaust	Did not directly comment on 'resilience' but noted that stress and distress are part of everyday life, and raised questions about how people survive and thrive in spite of adversity.	Asked 'what causes health?' noting the availability of resources (material, psychological, and biological) and the ability to use them contribute to a 'sense of coherence' - making sense of the world through comprehensibility, manageability, and

				meaningfulness.
				Sense of coherence is dynamic, common, health-oriented, and applicable across cultures.
Almedom et al, 2010 (& Almedom & Glandon)	Anthropology, medicine, community development	Comprehensive reviews of resilience studies	A "process, an outcome, a dynamic steady state in the face of adversity and defiance of risk/vulnerability" (Almedom & Glandon, 2007, p. 127) "[A] multi-dimensional construct…the capacity of individuals, families, communities, and institutions to anticipate, withstand and/or judiciously engage with catastrophic events and/or experiences; actively making meaning out of adversity… without fundamental loss of identity" (2010, p. 128)	Provides links between the related concepts of resilience and sense of coherence (salutogenesis). Notes resilience is more than simply the absence of disease but is a complex, dynamic state that defies simple measurement. Calls for mixed methods of research. Suggests meaning-making is key to adaptation, and learning is key to understanding resilience.
Ungar	Social work	Multiple contexts and cultures, primarily focused on children.	Resilience is the process used "to cope, adapt and take advantage of assets when facing significant acute or chronic stress, or the compounding effect of both together…the observable, often measurable, processes that are identified as helpful…to overcome adversity" (Ungar, 2012a, p. 387) "In the context of exposure to significant adversity, resilience is both the capacity of individuals to navigate their way to the psychological, social, cultural, and physical resources that sustain their well being, and the capacity individually and collectively to	Posits resilience as the processes utilized by individuals, families and communities to cope with and overcome adversity in a variety of contexts and across populations and cultures. Argues for the use of mixed methods research for the in-depth study of the physical and social 'ecologies'. Describes 4 principles that underpin resilience: 'complexity, cultural relativity, atypicality, and decentrality' which help define resilience and provides a framework for further research into theory and intervention. Suggests that defining and measuring resilience requires a clear understanding of the role of physical and social 'ecologies' on the positive outcomes following adversity. Provides a broad and meaningful lens through which to explore the concept of resilience;

			negotiate for these resources to be provided and experienced in culturally meaningful ways" (2008, p. 225)	shifts the discourse beyond individual resources to the ecological resources and processes that support resilience.
Yehuda	Biopsychology	US combat veterans diagnosed with PTSD	Conceptualizes resilience as "a reintegration of self that includes a conscious effort to move forward in an insightful integrated positive manner" and learning from adverse events	Looks at the influences of genetics and epigenetics on resilience. Focuses on individuals and the discovery of the biological influences on resilience, as well as commonalities across communities. Includes the biological components of resilience and considers how the constant interactions of people with their environment may be mediated by biology. Notes that explorations of resilience is important regardless of the how one defines the construct since trauma does not necessarily result in pathology.
Bonanno	Clinical psychology	Widows, survivors of 9/11 attacks (including emergency responders); multicultural, multidimensional research; uses construct validity and multiple independent measures	"The ability of adults in otherwise normal circumstances who are exposed to an isolated and potentially highly disruptive event…to maintain relatively stable, health levels of psychological and physical functioning" (2004, p.20-21)	Provides an evolving complex collaborative view of resilience consistently noting resilience is the most common response to trauma, loss, grief. Developed a model of resilience and has 'flipped' the exploration of resilience, noting that psychopathology cannot be understood nor effectively managed without a clear and deep understanding of resilience and health (2004). Links to 'health promotion'. Currently sees resilience as a broad umbrella concept. Notes resilience has multiple 'trajectories' that are common across populations, cultures, and incidents. Recognizes differences between populations (children/adults) and differences between interpretations of experiences giving rise to resilience (chronic/acute stressors). Notes resilience differs from recovery:

				resilience is the capacity of people who are faced with potentially disruptive experiences to maintain reasonably healthy & stable functioning; *recovery* occurs when functioning is temporarily disrupted to the point that people meet threshold or sub-threshold criteria for disease but over time return to pre-incident functioning. Themes include: heterogeneity of responses to traumatic events; emergent resilience to chronic adversity vs. minimal impact resilience after acute adversity; need for complex, integrated, multidisciplinary approaches for research and theory. Articulates the view that resilience research requires scientific rigour including 'measurable' outcomes and longitudinal studies.
Fletcher & Sarkar	Sport Psychology	Olympic & other high-performance athletes	"an overarching concept that encapsulates stressors, cognitive appraisal and meta-cognitions, psychological factors (positive personality, motivation, confidence, focus, perceived social support), and facilitative responses" (2013, p. 672)	Found multiple factors including cognitive appraisal, personal factors such as optimism, and social support are key concepts in resilience. Developed a multidimensional theory of resilience, contrasting to more the more linear representations of other models
de Terte, Stephens, & Huddleston	Clinical psychology	Police officers	"the ability of an individual to recover from a traumatic event or to remain psychologically robust when faced with an adverse event" (de Terte, Stephens, & Huddleston, p. 416)	Developed a three part bidirectional interactional model of resilience (cognition, environment, and behaviours combine to build resilience) in police officers, noting the positive effects of adaptive health practices such as exercise, nutrition, rest/relaxation and the effects of positive mental & cognitive factors such as optimism, cognitive reappraisal, etc.

APPENDIX II   PROGRAMME OF STUDY ETHICS APPROVAL

CRDC decision – Ethics approval

November 25, 2014 (email)

Sent on behalf of Kay Wheat (Chair CREC)

Dear Leigh

Thank you for your recent resubmission (No. 2014/72) to the College Research Ethics Committee (CREC) on 20 November 2014 requesting ethical clearance for the project entitled: Where the devil dances: A constructivist grounded theory of resilience in volunteer firefighters. I am pleased to inform you that the CREC was happy to confirm that in its judgement there were no outstanding ethical concerns that required further discussion or exploration prior to data collection.

The committee would like to wish you well in the completion of your project.

Yours sincerely

Kay Wheat

Chair CREC

Sandra Odell

College Research Support Team Leader

College Research Support Team, Business, Law & Social Sciences Nottingham Trent University, Nottingham, NG1 4BU

Direct Tel: +44 (0)115 848 8117

Location: Chaucer Room 4704

E-mail: Sandra.Odell@ntu.ac.uk

Website: www.ntu.ac.uk

APPENDIX III   PARTICIPANT INFORMATION AND CONSENT

HEALTH AND RESILIENCE IN THE FIRE RESCUE SERVICE (FRS)

INVESTIGATOR: Leigh S. Blaney, NOTTINGHAM TRENT UNIVERSITY (UK)

This form will provide you with information about the research. Please read through all the details carefully.

I am a PhD student at Nottingham Trent University (UK) investigating stress, resilience, and coping in select Canadian fire rescue services (FRS). The project focuses on the firefighters' (your) perspective of the effects of work-related stress on you, how you cope (what coping strategies you use) with work stress, and how you know your coping strategies work. I am asking firefighters from the FRS to participate in the study and I will analyse their responses, validate the information, and develop a report from the responses.

You are being asked to participate in an interview that will last more than 30 minutes. I will ask a series of questions about your own experience with work-related stress, resilience, and coping. During the interview, please let me know if you would rather not answer some of the questions put to you. Your participation in this project is voluntary; you may withdraw at any time for any reason without explanation and without penalty. You may choose not to answer any question. When giving consent, you are consenting to participate in the research, to be audio-recorded, and to have the information you provide used in this research and other settings such as operations manuals, training documents, journal articles, and conference presentations. Due to the nature of the research, extracts from the interview will be used in my thesis. To protect your anonymity all names, places and organisations will be changed. Only myself and my PhD supervisor will have access to recordings. All recordings will be destroyed after publication of research.

Upon completion of the interview you are free to ask any questions you may have about the interview or research in general. Support numbers will be made available to you after the interview in case any of the issues raised during the interview later prove to be upsetting to you.

Participation is voluntary and greatly appreciated. If you are happy to take part in this research please sign and date below. If you have any questions or concerns before, during or after your participation in this research my contact details are on the bottom of this form.

Agreement to consent

I have read and understand the purpose of this research and my part in it;

I have asked questions if needed and understand that I can contact the investigator at any time with queries or concerns.

I have the right to withdraw my data at any point during or after the interview and all materials will be destroyed.

I voluntarily agree to take part in this study.

Signature of participant: _____
Date: _____
If at the time you are being interviewed or afterwards, you experience any reactions that are troubling, please contact your FRS' CISM peer support network, your employee assistance program, or contact me directly for a confidential referral to a CISM provider in your area. It is not unusual for reactions to be "triggered" weeks, months, or years after the critical incident, but it is important that you have an opportunity to discuss those delayed reactions if they occur.
INVESTIGATOR CONTACT: Leigh Blaney leigh.blaney@viu.ca 1-250-753-3245 ext 2519
PhD SUPERVISOR CONTACT: Dr. David Wilde david.wilde@ntu.ac.uk +44 (0) 115 848 2718 (UK)

APPENDIX IV   GUIDE FOR PRELIMINARY INTERVIEWS

Preliminary/face-to-face/intensive interview schedule

The researcher is known to the majority (if not all) of the fire rescue services (FRS) and the firefighters who potentially will be participating in the research. The researcher is routinely on-station, and often present in the aftermath of critical events. As such, what may be considered 'hard conversations' (those that discuss personal values, beliefs, reactions, coping, etc.) to the general population, are routine conversational content in the context of the researcher's role with the FRS. Rapport has already been established as has the overall expectation that the researcher is present because something critical has occurred and is interested in hearing the firefighters' perspectives. This level of rapport/comfort allows for quick movement from social 'chit chat' to the more intensive interview questions.   The questions below appear linear and researcher-focused however, as with interviewing in a clinical context, the questions will only be asked to 'spark' thought/narrative by the firefighters; once the interview begins, the researcher will 'get out of the way' to allow the firefighters and their narratives to lead the interview – the researcher will speak when there is a need to re-direct back to a topic or to ask a clarifying question. The interview will be similar to a client-centered therapeutic interview in the clinical setting.

1. **Participants will be asked basic demographics information**: gender, age, relationship status, current fire service role/rank, section (fire suppression, communications, command, education/prevention), what is required in that role, overall years of service; what are the call-out process (i.e. pager?) and 'crewing' of calls (i.e. minimum of 4 on truck, trucks can't roll until fully crewed, etc.); as volunteer ff, what is your 'day' job, what is the shift/work pattern of that job
   a. How do you deal with multiple roles? What is the spillover?
   b. What is your motivation for coming into the FRS? For staying in? Does the volunteer service become a 'career'? What's the difference between volunteer FRS & career FRS in terms of motivation, duties, time/energy put into the FRS?
2. This project is looking at resilience in volunteer firefighters.
   a. **Do you see yourself as resilient? How so?**
   b. **Tell me a story/give me an example about you and resilience in your fire career – about a time\times when you were resilient.**
   c. **What are the markers of resilience in/for you**?
3. *Tell me about a time when you didn't feel (or someone you know)/weren't*

302

resilient.

    a. How did you know you weren't resilient? What made you unable to be resilient?

    b. Yet you are still in the FRS – how did you get through that vulnerable period? Did you become resilient again afterwards? When/how long? What helped?

4. **Questions about traumatic events:**

    a. When did you last experience a work-related critical incident?

    b. Tell me about that event.

    c. What reactions did you have to this incident? (please describe any specific physical, emotional, thinking, spiritual, or behavioural reactions you had); what other reactions?

    d. How did you deal with/live with your reactions?

    e. What does this story & your reactions mean in the context of 'resilience' in the FRS?

5. **Questions about coping**

    a. After you experience a critical incident, what helps you the most? / What has been most helpful after a c.i.? /what helps you manage after a c.i.

    b. Tell me about it/give me an example of _____ (coping)

    c. How does it tie in with resilience?

    d. How does it help you be resilient and move away from things that are distressing?

    e. Tell me about other incidents where you (or others around you) didn't cope so well...How does that relate to resilience?

6. **Who** helps you after a c.i.?

7. Tell me about some other critical events that tie in with our discussion of resilience.

8. **How has 'coping' changed for you over the course of your career? Paint a picture for me**

    a. Tell me about how you call upon/access this strategy.

        i. Is it conscious, unconscious? Do you think about it or does it just happen? How did you learn it?

9. *Other firefighters have mentioned things that help to get through stressful events …. (e.g. 'resilience', 'relationships' [crew/family of FRS, marital/biological family, friends, etc.], 'meaning making or sense-making', 'organizational issues', 'culture', 'teamwork', 'leadership' 'brotherhood'….)*

    a. What do/does this term mean to you?

    b. Give me an example of _____ (this term) in your career? Give me an example of this in the FRS.

    c. What do you think about this?

    d. How does it tie in with resilience?

      e. *How do you personally experience …..?*

10. **What other comments about yours (or others') experience(s) of resilience, work-related stress &/or coping do you have?**

11. *What is the key to resilience/immunity/bounce back?*

12. **What is your greatest strength?** *How do you epitomize resilience?*

13. **From your perspective, what else should I know/understand about resilience, stress/coping in the FRS?**

      a. **Are there things that I/you might not have thought about before that have occurred to you during this interview?**

      b. **Do you have any questions for me?**

APPENDIX V   GUIDE FOR FOLLOW-UP INTERVIEWS

Interviews 2 & 3 (face-to-face or asynchronous email) - Follow-up questions

Participants will be identified by the number they were assigned during the initial interview (i.e. FF1, FF2, FF3, etc.) and interviews 2 & 3 will be designated at the start of the interview or in the email (i.e. FF1-2, or FF1-3). Basic demographic information will be reviewed as needed: age, current fire service role/rank, section (fire suppression, communications, command, education/prevention), overall years of service; what is their 'day' job, what is the shift/work pattern of that job…

A reminder re: consent and right to withdraw will be given; if email, the e-consent will be attached.

Questions follow directly from the initial interview, and have been adapted from the original follow-up schedule after consultation with the supervisory team.

Depending on the length of the 2nd interview (i.e. no longer than 90 mins – this is the average of the 1st interview, and I was exhausted, as I suspect the participants were, by this time), the questions may be asked in 2 separate interviews (i.e. in the 3rd interview)

1. **Previous participants have spoken about the idea of being of *service* (to the FRS, to the community); how do you see your role in this respect?**
    a. **How does the concept of service differ from some public perceptions of firefighters as being 'heroic' or 'selfless'?**
    b. **How does service relate/contribute to resilience?**
    c. **How does the concept of service vary between career and volunteer firefighters?**
2. **When do you take time off or mark yourself 'unavailable' to the FRS?**
    a. **When do you turn off your pager?**
    b. **What's it like to turn off your pager/be 'unavailable'?**
3. **How would you describe the *leadership* style (formal & informal) in your department?**
    a. **What are the most important values, ethics that leadership demonstrates?**
        i. **Can you give me an example of that?**
        ii. **How does leadership contribute to resilience in your department?**
4. **If you were to describe the departmental *culture in 3 words*, what would you say?**
    a. **What is good about it?**
    b. **What can be improved?**

    c.   **How does working in this culture contribute to resilience for you? For the department?**

5. **Previous participants have talked about the need for 'meaning-making' or 'sense-making' of difficult calls as a component of resilience.**
    a.   **How have you searched for meaning in difficult calls?**
    b.   **What meanings have you found in these difficult calls?**

6. **Previously, we touched on things like 'learning', 'ongoing education', 'always something to learn' as a requisite of the job.**
    a.   **How do you see learning contributing to resilience?**

7. **A lot of firefighters have talked about how they manage and express their emotions in the job – tell me how you manage your emotions?**
    a.   **When is it ok/not ok to express emotions?**
    b.   **What emotions can be expressed?**
    c.   **How does emotional expression relate to resilience**

8. ~~How would you like to be identified in the research report/thesis?~~

9. **Do you have any questions for me?**

Interview 3

- A reminder re: consent and right to withdraw; if email, the e-consent will be attached.
- Ask a questions that were left over from interview 2.
- Give a brief overview of the theory using the 'map' for visual orientation (when f2f interview, use both the map and the gearball)
- Provide some time for participants to ponder the theory and ask questions.

Interview 3 guide:

1) Before getting to what we've found so far, I just wanted to check in about a couple of things that I may have missed the last time we talked…
2) **What do you think of this theory/model/representation of resilience in volunteer firefighters?**
3) **What are some of the strengths of the theory in relation to your thoughts/ideas about resilience?**
4) **What are some limitations of this theory?**
5) **Describe how you relate this theory to your own resilience.**

Random questions to potentially allow further explication of resilience:
6) How do previous PTE's affect your current resilience?
7) What are some vulnerabilities that may weaken your resilience?
8) How can you/do you build on your resilience?
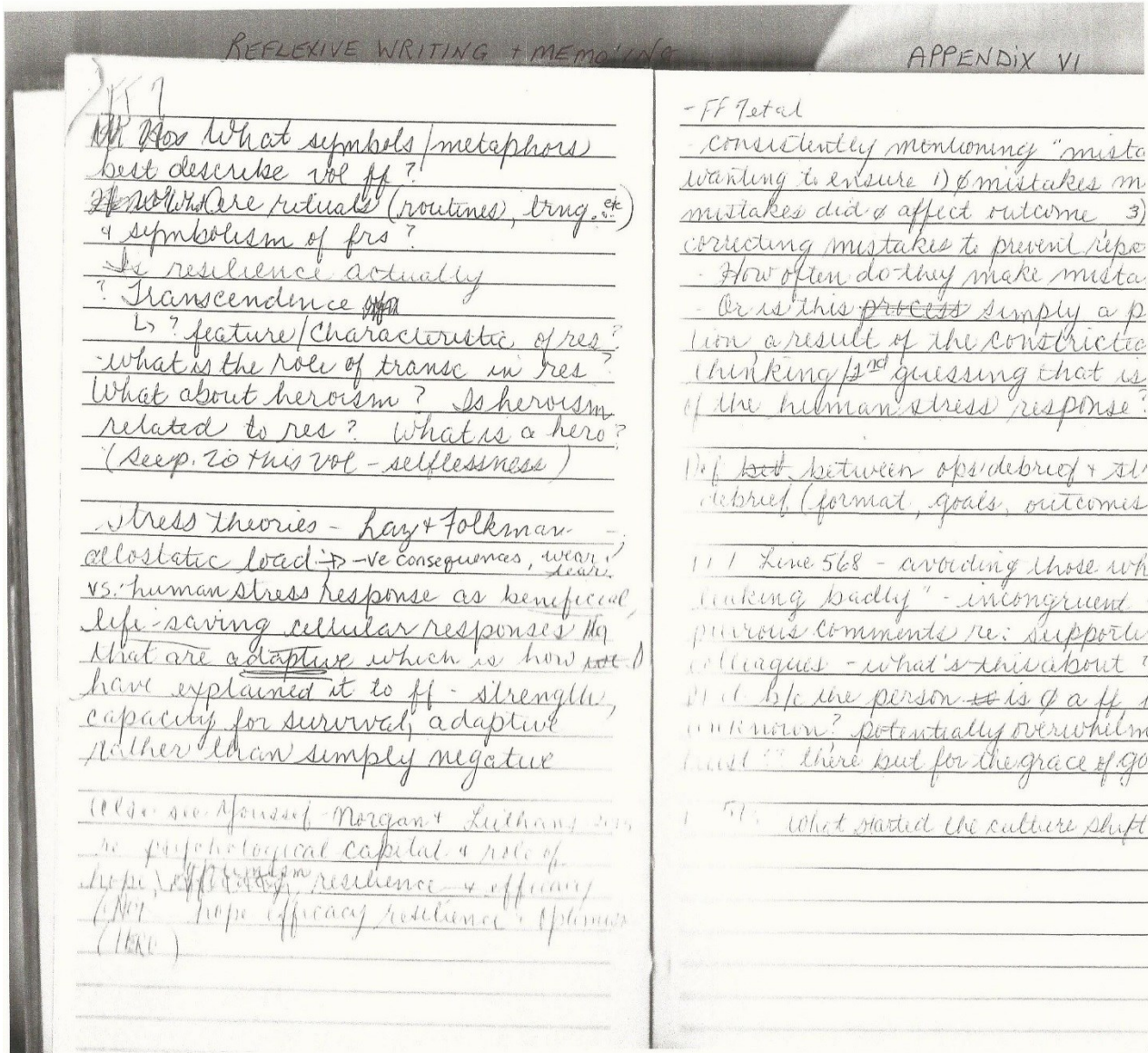
REFLEXIVE WRITING + MEMO'ING

What symbols / metaphors best describe rol ff?

Are rituals (routines, trng. etc) & symbolism of frs?

Is resilience actually ? Transcendence
⤷ ? feature / characteristic of res?
- What is the role of transc in res?
What about heroism? Is heroism related to res? What is a hero?
(See p. 20 this vol - selflessness)

- Stress theories - Lay & Folkman - allostatic load → -ve consequences, wear/tear
vs. human stress response as beneficial life-saving cellular responses Hg that are adaptive which is how rol I have explained it to ff - strength, capacity for survival, adaptive rather than simply negative

(Also see Youssef Morgan & Luthans re psychological capital + role of hope, efficacy resilience + efficacy
(Key hope efficacy resilience + optimism
(here)

- FF fetal
- consistently mentioning "mista wanting to ensure 1) 0 mistakes m mistakes did 0 affect outcome 3) correcting mistakes to prevent repe
- How often do they make mista
- Or is this process simply a p lion a result of the constricted thinking/2nd guessing that is of the human stress response?

Def btwn ops debrief + st debrief (format, goals, outcomes

Line 568 - avoiding those who making badly" - incongruent purious comments re: support colleagues - what's this about? b/c the person is 0 a ff unknown? potentially overwhelm there but for the grace of go

What started the culture shift

ANALYSIS MINDMAP APPENDIX VII
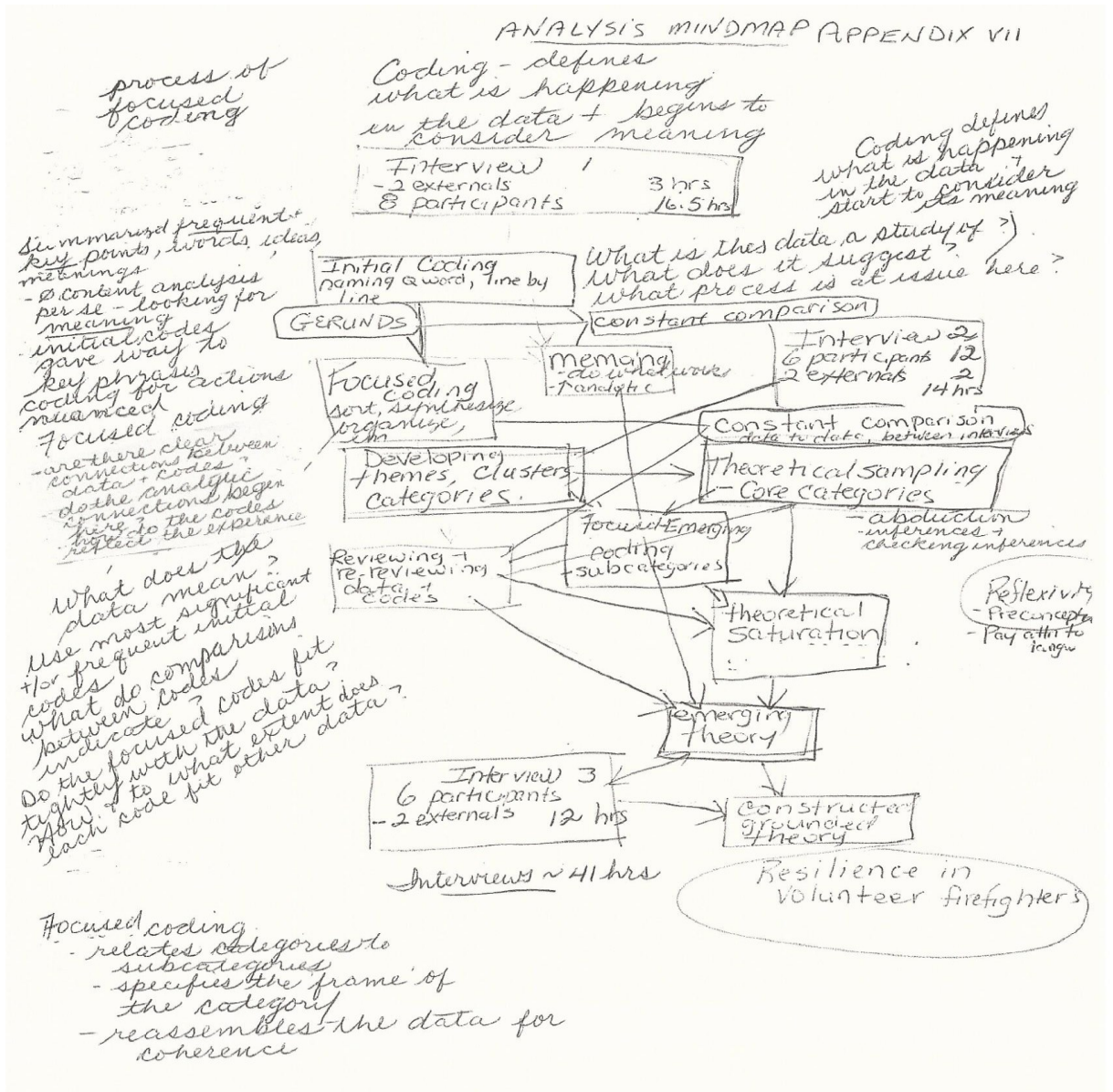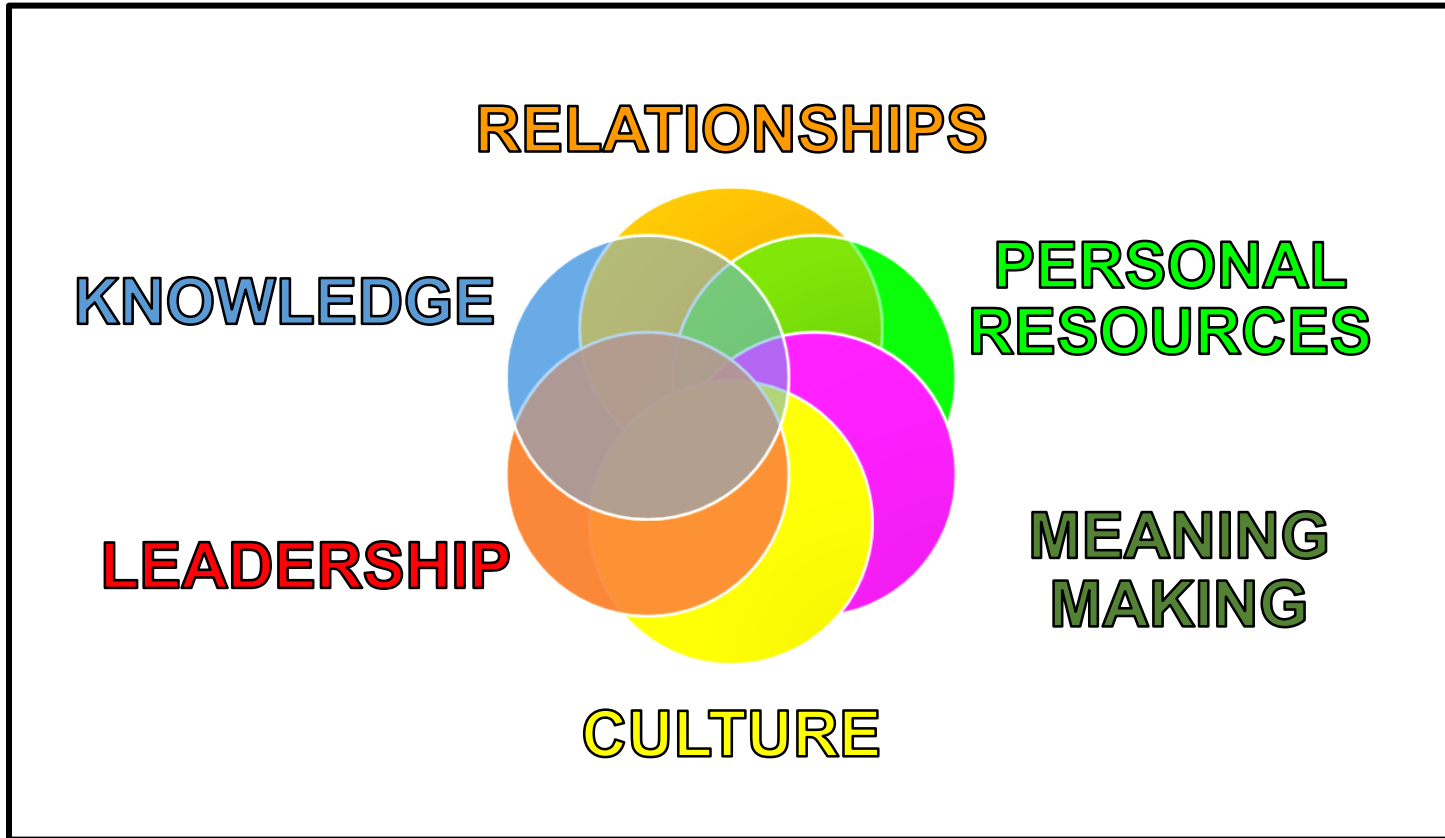
APPENDIX IX   **CONFERENCE PUBLICATIONS FROM THIS PROGRAMME OF STUDY**

Blaney, L. (2014). *From Florence Nightingale to Kathy Charmaz: The methodological journey to constructivist grounded theory with firefighters.* Presented at the Emergency Services Conference, Themes in Planning, Response, and Recovery. Nottingham, United Kingdom. November 11.

Blaney, L. (2014). *Firefighter resilience – the imperative for the multiple lenses of interdisciplinary research.* Presented at the Annual Conference: Fire Related Research and Developments (RE14). Moreton-in-Marsh, United Kingdom. November 13.

Blaney, L. (2015). *Working where the devil dances: A preliminary theory of resilience in volunteer firefighters.* Lunch and Learn Speaker Series - Vancouver Island University, Research and Scholarly Activity Office, Nanaimo, Canada. December 1.

Blaney, L., Wilde, D., Hill, R., & Brunsden, V. (2016). *Working where the devil dances: A constructivist grounded theory of resilience in volunteer firefighters.* Presented at the International Disaster Psychosocial (DPS) Conference, Vancouver, Canada. March 21.

Blaney, L., Wilde, D., Hill, R., & Brunsden, V. (2016). *Dancing with the devil: A theory of resilience in volunteer firefighters.* Poster presentation at the Looking Back, Looking Forward: Marking 20 years of Fire Related Research, Development, and Innovation (RE16) conference, Birmingham, UK. November 15.