Emergency service providers' organizational climate and its role in the development of traumatic stress and posttraumatic growth

Lori K. Gray
University of Windsor

Follow this and additional works at: https://scholar.uwindsor.ca/etd

Recommended Citation

This online database contains the full-text of PhD dissertations and Masters' theses of University of Windsor students from 1954 forward. These documents are made available for personal study and research purposes only, in accordance with the Canadian Copyright Act and the Creative Commons license—CC BY-NC-ND (Attribution, Non-Commercial, No Derivative Works). Under this license, works must always be attributed to the copyright holder (original author), cannot be used for any commercial purposes, and may not be altered. Any other use would require the permission of the copyright holder. Students may inquire about withdrawing their dissertation and/or thesis from this database. For additional inquiries, please contact the repository administrator via email (scholarship@uwindsor.ca) or by telephone at 519-253-3000 ext. 3208.
EMERGENCY SERVICE PROVIDERS' ORGANIZATIONAL CLIMATE
AND ITS ROLE IN THE DEVELOPMENT OF
TRAUMATIC STRESS AND POSTTRAUMATIC GROWTH

by

Lori K. Gray

M.A., University of Windsor, 2004

A Dissertation
Submitted to the Faculty of Graduate Studies
Through the Department of Psychology
In Partial Fulfillment of the Requirements for the
Degree of Doctor of Philosophy at the
University of Windsor

Windsor, Ontario, Canada
© 2008 Lori K. Gray
NOTICE:
The author has granted a non-exclusive license allowing Library and Archives Canada to reproduce, publish, archive, preserve, conserve, communicate to the public by telecommunication or on the Internet, loan, distribute and sell theses worldwide, for commercial or non-commercial purposes, in microform, paper, electronic and/or any other formats.

The author retains copyright ownership and moral rights in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

In compliance with the Canadian Privacy Act some supporting forms may have been removed from this thesis.

While these forms may be included in the document page count, their removal does not represent any loss of content from the thesis.

Canada
AUTHOR'S DECLARATION OF ORIGINALITY

I hereby certify that I am the sole author of this dissertation and that no part of this dissertation has been published or submitted for publication.

I certify that, to the best of my knowledge, my dissertation does not infringe upon anyone's copyright nor violate any proprietary rights and that any ideas, techniques, quotations, or any other material from the work of other people included in my dissertation, published or otherwise, are fully acknowledged in accordance with the standard referencing practices. Furthermore, to the extent that I have included copyrighted material that surpasses the bounds of fair dealing within the meaning of the Canada Copyright Act, I certify that I have obtained a written permission from the copyright owner(s) to include such material(s) in my dissertation and have included copies of such copyright clearances to my appendix.

I declare that this is a true copy of my dissertation, including any final revisions, as approved by my thesis committee and the Graduate Studies office, and that this dissertation has not been submitted for a higher degree to any other University of Institution.
ABSTRACT

Emergency service providers are at risk for developing symptoms of traumatic stress because of the frequency and severity of trauma that they may endure while on the job (Regehr & Bober, 2005). However, it has become increasingly clear that factors, other than traumatic events, might be involved in the development of traumatic stress among emergency service providers. The present study examined the relationship between emergency service providers' organizational climate and organizational commitment to the presence of traumatic stress symptoms and posttraumatic growth. Participants included a sample of 251 Canadian emergency service providers (198 firefighters, 35 paramedics, 6 police officers, and 12 victim service providers). The study utilized self-report data obtained from an anonymous internet survey. Measures of traumatic stress symptoms, posttraumatic growth, multiple dimensions of job stress, organizational commitment, organizational support, and team cohesion were included. Moderated multiple regression and path analyses were used to elucidate the precise relationship between the aforementioned variables. Results from the present study indicate that the organizational variables had direct, mediating, and moderating relationships with traumatic stress and posttraumatic growth. Furthermore, results from hierarchical multiple regression analyses indicate that the organizational variables predicted a significant proportion of the variance in traumatic stress symptoms, above and beyond the characteristics of trauma exposure. Together these findings suggest that emergency service providers' organizational climate and organizational commitment might have the potential to prevent or engender the development of traumatic stress and posttraumatic growth.
DEDICATION

This dissertation is gratefully dedicated to emergency service providers, who repeatedly witness life’s tragedies yet maintain an atmosphere of genuine camaraderie. Thank you for sharing your thoughts and experiences throughout this project. It is my sincere hope that this project will advance the manner in which traumatic stress is addressed within the emergency services, by better encompassing the broad array of stressors with which you must contend.

This dissertation is also dedicated to those persons who have contributed to this project along its journey to completion. A special thank you is extended to Dr. Jackson for imparting his knowledge throughout the years and fostering a genuinely collaborative environment. My gratitude is also extended to the committee members, Drs. Lafreniere, Fellbaum, Schlosser, Scoboria, and Farvolden for their enthusiasm and insightful contributions. Sincere appreciation is extended to the following persons for their support in this study: Dr. Brooks, Chief Stewart, Chief Fields, Assistant Chief Scharf, Director Brian Bildfell, Scott Marks, Len Letourneau, Ed Dickson, Dawn Ricker-Vassos, and Elizabeth and Gordon Glibbery. I am particularly grateful to Jim Jeanette and Jack Benbihy for their notable contribution to participant recruitment.

Most importantly, this dissertation is dedicated to those persons who have offered their support throughout the years. My deepest gratitude is extended to my husband, family, friends, colleagues, and supervisors for their unwavering support throughout the pursuit of doctoral studies.
TABLE OF CONTENTS

AUTHOR'S DECLARATION OF ORIGINALITY iii
ABSTRACT iv
DEDICATION v
LIST OF TABLES x
LIST OF FIGURES xi

CHAPTER

I. INTRODUCTION 1
Potentially Traumatic Events 1
Stressors, Stress, and Strain 1
Consequences of Trauma Exposure and Traumatic Stress 2
Emergency Service Providers' Organizational Climate 2
Status of the Research 3
The Proposed Research 3
Purpose 3
Importance 4
Academic Contributions 4
Applied Contributions 4

II. LITERATURE REVIEW 5
Trauma Exposure among Emergency Service Providers 5
Direct Trauma Exposure 6
Secondary Trauma Exposure 6
Vicarious Trauma Exposure 7
Problematic Reactions to Trauma Exposure 7
Normal versus Problematic Reactions 7
Acute and Posttraumatic Stress Disorders 8
Disorders of Extreme Stress not otherwise Specified or Complex PTSD 8
Compassion Fatigue and Secondary Traumatic Stress Disorder 9
Burnout 10
Consequences of Trauma Exposure and Traumatic Stress 10
Negative Outcomes 10
Positive Outcomes: Posttraumatic Growth 11
Trends and Prevalence of Traumatic Stress 13
Prevalence of Traumatic Stress Symptoms 13
Symptom Severity 13
Prevalence of PTSD 13
Course of Symptoms 14
Traumatic Stress among Emergency Service Providers 14
Factors in the Development of Traumatic Stress 15
Variability in Responses to Traumatic Events 15
Characteristics of Trauma Exposure 15
Team Cohesion 38
Hypothesis 6 39
Organizational Commitment 39
Hypothesis 7 40
Hypothesis 8 40
Absenteeism 40
Hypothesis 9 41
Hypothesis 10 41
Relative Contributions 41
Hypothesis 11 41
Data Analytic Strategy 42

III. METHOD 44

Participants 44
General Description 44
Exclusion Criteria 44
Participant Characteristics 44

Measures 48
The Impact of Events Scale – Revised 48
  Description 48
  Reliability and Validity 48
The Posttraumatic Growth Inventory 49
  Description 49
  Reliability and Validity 49
The Job Stress Questionnaire 50
  Description 50
  Reliability and Validity 50
The Psychological Climate Questionnaire 50
  Description, Reliability, and Validity 50
The Affective, Continuance, and Normative Commitment Scales 51
  Description 51
  Reliability and Validity 51
The Survey of Perceived Organizational Support 53
  Description 53
  Versions of the SPOS 53
  Reliability and Validity 53
The Organizational Citizenship Behaviour Scale 54
  Description 54
  Reliability and Validity 55
The Revised Substitutes for Leadership Scale 55
  Description 55
  Reliability and Validity 56
Trauma Exposure and Distress Ratings 56
Open-Ended Questions 57

Procedures 57
Recruitment of Emergency Service Organizations 57
Participant Recruitment 58
Internet Survey Procedures 58
### IV. RESULTS

<table>
<thead>
<tr>
<th>Data Screening</th>
<th>59</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive and Exploratory Analyses</td>
<td>59</td>
</tr>
<tr>
<td>Correlational Analyses</td>
<td>64</td>
</tr>
<tr>
<td>Relative Contributions of Trauma Exposure and the Organizational Climate</td>
<td>66</td>
</tr>
<tr>
<td>Moderating Relationships</td>
<td>70</td>
</tr>
<tr>
<td>MMR with Traumatic Stress Symptoms as the Criterion Variable</td>
<td>70</td>
</tr>
<tr>
<td>MMR with Posttraumatic Growth as the Criterion Variable</td>
<td>77</td>
</tr>
<tr>
<td>Mediating Relationships</td>
<td>79</td>
</tr>
<tr>
<td>Trauma Model</td>
<td>79</td>
</tr>
<tr>
<td>Mediating Relationships: Overall Approach</td>
<td>82</td>
</tr>
<tr>
<td>The Role of Organizational Commitment</td>
<td>82</td>
</tr>
<tr>
<td>The Role of the Organizational Climate</td>
<td>87</td>
</tr>
</tbody>
</table>

### V. DISCUSSION

<table>
<thead>
<tr>
<th>Summary</th>
<th>96</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma Model</td>
<td>96</td>
</tr>
<tr>
<td>Correlational Analyses</td>
<td>97</td>
</tr>
<tr>
<td>Relative Contributions</td>
<td>98</td>
</tr>
<tr>
<td>Moderating Relationships</td>
<td>99</td>
</tr>
<tr>
<td>Mediating Relationships</td>
<td>100</td>
</tr>
<tr>
<td>General Discussion: Traumatic Stress and the Organizational Climate</td>
<td>101</td>
</tr>
<tr>
<td>General Discussion: Posttraumatic Growth and the Organizational Climate</td>
<td>104</td>
</tr>
<tr>
<td>Methodological Limitations and Recommendations for Future Research</td>
<td>109</td>
</tr>
<tr>
<td>Implications and Conclusions</td>
<td>111</td>
</tr>
<tr>
<td>Implications for the Academic Community</td>
<td>111</td>
</tr>
<tr>
<td>Implications for Emergency Service Providers</td>
<td>112</td>
</tr>
<tr>
<td>Implications for Interventions</td>
<td>113</td>
</tr>
<tr>
<td>Implications for Emergency Service Organizations</td>
<td>114</td>
</tr>
</tbody>
</table>

### REFERENCES

116

### APPENDICES

<table>
<thead>
<tr>
<th>A: Glossary of Terms</th>
<th>130</th>
</tr>
</thead>
<tbody>
<tr>
<td>B: Summary of Stress Theories and Relevance to the Present Study</td>
<td>134</td>
</tr>
<tr>
<td>C: Unpublished Questionnaires</td>
<td>136</td>
</tr>
<tr>
<td>D: Consent Form</td>
<td>138</td>
</tr>
<tr>
<td>E: Intercorrelations among the Main Study Variables</td>
<td>140</td>
</tr>
<tr>
<td>F: Correlations between the Demographic and Main Study Variables</td>
<td>142</td>
</tr>
<tr>
<td>G: Summary of Hypotheses and Results Obtained in the Present Study</td>
<td>143</td>
</tr>
</tbody>
</table>

### VITA AUCTORIS

145
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Summary of Hypotheses</td>
<td>42</td>
</tr>
<tr>
<td>2. Descriptive Statistics for Variables Employed in the Present Study</td>
<td>60</td>
</tr>
<tr>
<td>3. Correlations between the Severity and Distress Associated with Overall Trauma and the Index Trauma</td>
<td>60</td>
</tr>
<tr>
<td>4. Correlations between Trauma Exposure and Posttraumatic Sequelae</td>
<td>61</td>
</tr>
<tr>
<td>5. Correlations between Trauma Exposure and the IES-R Subscales</td>
<td>62</td>
</tr>
<tr>
<td>6. Correlations between Trauma Exposure and the PTGI Subscales</td>
<td>62</td>
</tr>
<tr>
<td>7. Descriptive Statistics for IES-R and PTGI Across the Demographic Variables</td>
<td>63</td>
</tr>
<tr>
<td>8. Correlations between the Organizational Climate, Organizational Commitment and Posttraumatic Sequelae</td>
<td>64</td>
</tr>
<tr>
<td>9. Correlations between Absenteeism, the Organizational Climate, Organizational Commitment, and Posttraumatic Sequelae</td>
<td>65</td>
</tr>
<tr>
<td>10. Contribution of the Organizational Variables in the Prediction of IES-R Scores, Above and Beyond Trauma Exposure</td>
<td>66</td>
</tr>
<tr>
<td>11. Contribution of the Organizational Variable Subscales in the Prediction of IES-R Scores, Above and Beyond Trauma Exposure</td>
<td>67</td>
</tr>
<tr>
<td>12. Contribution of Trauma Exposure in the Prediction of IES-R Scores, Above and Beyond the Organizational Variables</td>
<td>68</td>
</tr>
<tr>
<td>13. Contribution of Trauma Exposure in the Prediction of IES-R Scores, Above and Beyond the Organizational Variable Subscales</td>
<td>69</td>
</tr>
<tr>
<td>14. MMR of the Impact of Autonomy in the Relationship between Traumatic Stress Symptoms and Overall Trauma Exposure</td>
<td>72</td>
</tr>
<tr>
<td>15. MMR of the Impact of Autonomy in the Relationship between Traumatic Stress Symptoms and Overall Distress</td>
<td>73</td>
</tr>
<tr>
<td>16. MMR of the Impact of Workload on the Relationship between Traumatic Stress Symptoms and Severity of the Index Trauma</td>
<td>75</td>
</tr>
<tr>
<td>17. MMR of the Impact of Workload on the Relationship between Traumatic Stress Symptoms and Distress (Index Trauma)</td>
<td>76</td>
</tr>
<tr>
<td>18. MMR of the Impact of Perceived Organizational Support on the Relationship between Traumatic Stress Symptoms and Overall Trauma Exposure</td>
<td>77</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Potentially Traumatic Events Experienced by Emergency Service Providers</td>
<td>46</td>
</tr>
<tr>
<td>2. Perceived Distress Associated with Potentially Traumatic Events</td>
<td>47</td>
</tr>
<tr>
<td>3. MMR of the Impact of Autonomy in the Relationship between Traumatic Stress Symptoms and Overall Trauma Exposure</td>
<td>72</td>
</tr>
<tr>
<td>4. MMR of the Impact of Autonomy in the Relationship between Traumatic Stress Symptoms and Distress</td>
<td>73</td>
</tr>
<tr>
<td>5. MMR of the Impact of Workload on the Relationship between Traumatic Stress Symptoms and Severity of the Index Trauma</td>
<td>75</td>
</tr>
<tr>
<td>6. MMR of the Impact of Workload on the Relationship between Traumatic Stress Symptoms and Distress (Index Trauma)</td>
<td>76</td>
</tr>
<tr>
<td>7. MMR of the Impact of Perceived Organizational Support on the Relationship between Traumatic Stress Symptoms and Overall Trauma Exposure</td>
<td>78</td>
</tr>
<tr>
<td>8. Just-Identified Path Diagram of the Relationship between Trauma Exposure, Distress, and Trauma Sequelae</td>
<td>80</td>
</tr>
<tr>
<td>9. Identified Path Diagram of the Relationship between Trauma Exposure, Distress, and Trauma Sequelae</td>
<td>81</td>
</tr>
<tr>
<td>10. The Role of Affective Commitment in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae</td>
<td>83</td>
</tr>
<tr>
<td>11. The Role of Normative Commitment in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae</td>
<td>84</td>
</tr>
<tr>
<td>12. The Role of Normative Commitment in the Relationship between Index Trauma, Distress, and Trauma Sequelae</td>
<td>85</td>
</tr>
<tr>
<td>13. The Role of High Sacrifice Commitment in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae</td>
<td>86</td>
</tr>
<tr>
<td>14. The Role of Low Alternative Commitment in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae</td>
<td>87</td>
</tr>
<tr>
<td>15. The Role of Perceived Organizational Support in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae</td>
<td>89</td>
</tr>
<tr>
<td>16. The Role of Team Cohesion in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae</td>
<td>90</td>
</tr>
<tr>
<td>17. The Role of Workload in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae</td>
<td>91</td>
</tr>
<tr>
<td>18. The Role of Utilization of Skills in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae</td>
<td>92</td>
</tr>
<tr>
<td>19. The Role of Role Clarity in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae</td>
<td>93</td>
</tr>
<tr>
<td>20. The Role of Autonomy in the Relationship between Trauma Exposure, Distress and Trauma Sequelae</td>
<td>94</td>
</tr>
</tbody>
</table>
Chapter 1: Introduction

Potentially Traumatic Events

In recent years, there have been attempts to better characterize the types of events that most people consider to be traumatic. The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000) proposes that such events involve actual or threatened death or physical injury, or threat to the bodily integrity of oneself or other people. Examples include natural disasters, violent assaults, terrorism, medical emergencies, motor vehicle accidents, death, mutilated bodies, multiple casualties, mass destruction, line-of-duty death, and a myriad of other events. In order for an event to be classified as traumatic, it must be perceived as such by the individual in question (Rosenbloom, Williams, & Watkins, 1999). Similarly, the DSM-IV-TR stipulates that the person's response to such an event must have involved intense fear, helplessness, or horror (APA, 2000).

Some experiences are likely to be perceived as traumatic by almost anyone, whereas other events might be perceived as traumatic by one person but not by another (Rosenbloom et al., 1999). This means that traumatic events are not limited to those events involving much suffering or destruction. Instead, low-profile events that connect with an emergency responder at a highly personal level can also be traumatic (Regehr & Bober, 2005). Two examples are the death of a lonely elderly person and the despair of a suicide victim (Regehr & Bober, 2005). Consistent with the existing literature, “trauma” and “traumatic events” will hereafter refer to those events that are potentially traumatic and are likely to be perceived as traumatic by most people (Herman, 1997).

Stressors, Stress, and Strain

Stressors refer to factors in the external environment that induce stress among people exposed to them (Greenberg, Baron, Sales, & Owen, 2000). Emergency service personnel can be exposed to an array of environmental stressors, such as traumatic events, heavy workload, and poor road conditions. Stress refers to the pattern of emotional, physiological, or cognitive reactions occurring in response to stressors (Greenberg et al., 2000). Strains refer to the deviations from normal states of functioning that result from stress, such as physical symptoms (e.g., stomach pain), psychological symptoms (e.g., hyperarousal), and behaviours (e.g., absenteeism, lowered productivity; Greenberg et al., 2000). The term, traumatic stress, has been used throughout the literature to refer to the psychological strains that can result from trauma exposure.

Traumatic stress encapsulates the symptoms of Posttraumatic Stress Disorder, Acute
Stress Disorder, Secondary Traumatic Stress Disorder, Compassion Fatigue, Complex Posttraumatic Stress Disorder, and Disorders of Extreme Stress not Otherwise Specified (e.g., van der Kolk, McFarlane, & Weisaeth, 1996).

Consequences of Trauma Exposure and Traumatic Stress

Traumatic stress has been associated with short-term and long-term emotional and physical disorders, difficulties in interpersonal relationships, substance abuse, burnout, shortened careers (Beaton & Murphy, 1995); changes in sleep, appetite, and social interactions (Taylor & Fraser, 1982); impaired information processing, sense of alienation, isolation, withdrawal, loss of confidence, guilt, feelings of insanity, loss of control, suicidal ideation (Dunning & Silva, 1980; Solomon & Horn, 1986; van der Kolk, 1988); leaves of absence, job ineffectiveness, compromised job safety (Shalev & Yehuda, 1998); duodenal ulcers, cardiovascular problems, pulmonary embolisms and infarctions, and cirrhosis of the liver (Figley, 1995). More recently, there has been growing awareness that traumatic events can present the opportunity for growth and positive change (Caplan, 1964; Tedeschi & Calhoun, 1996). These positive outcomes have been labelled, posttraumatic growth, and can include changes in relating to others, a new outlook on life, increased personal strength, spiritual change, and greater appreciation of life (Tedeschi & Calhoun, 1996).

Emergency Service Providers' Organizational Climate

Exposure to traumatic events is an inescapable component of the routine job duties of emergency service providers. Their exposure to traumatic events is repetitive, potentially cumulative, and threatening to their personal safety, health, and well-being (Beaton & Murphy, 1995). A growing body of literature suggests that emergency service providers are at risk for developing traumatic stress because of the frequency and severity of trauma that they may endure while on the job (Regehr & Bober, 2005).

Although trauma exposure is a necessary precursor to the development of traumatic stress, the relationship between trauma exposure and traumatic stress among emergency service providers has been non-significant in a number of studies (e.g., Bryant & Guthrie, 2005; Hafeez, 2003; Lowery & Stokes, 2005). Furthermore, the prevalence of Posttraumatic Stress Disorder (PTSD) among emergency service providers is similar to the prevalence of PTSD among the general population. Existing research has found that approximately 18% of emergency service providers develop PTSD (Hytten & Hasle, 1989) whereas approximately 15% to 25% of those exposed to trauma in the general population develop PTSD (Breslau, 1998). Based on the
frequency of trauma exposure among emergency service providers as well as the cumulative effects of repeated trauma exposure, a higher prevalence of traumatic stress among this population would be expected. These findings suggest that other factors might be involved in the relationship between trauma exposure and traumatic stress in this population.

Status of the Research

Various studies have attempted to elucidate the factors that prevent and engender the development of traumatic stress among emergency service providers. In an unpublished dissertation, Allen (1995) investigated the relationship between chronic work-related stressors (i.e., role conflict, job ambiguity, workload, and interpersonal conflict) and traumatic job events among a sample of firefighters. It was hypothesized that “the relationship between chronic occupational stressors and strains (would) be weaker than the relationship between traumatic job events and strains among firefighters” (Allen, 1995, p. 24). Instead, the correlations between chronic occupational stressors and strains were stronger than the correlations between traumatic job events and strains among firefighters. Regehr, Hemsworth, Leslie, Howe, and Chau (2004) conducted a study of child welfare workers. It was found that “organizational factors” (i.e., perceived support of the union, perceived support of management, and ongoing workload stressors) had a significant direct effect on distress and also had the strongest association with distress, compared to individual and incident factors. Together these findings suggest that emergency service providers' perceived organizational climate might play an important role in the development and prevention of traumatic stress.

Although increasing attention has been directed towards emergency service providers' perceived organizational climate, many aspects of the organizational climate have not been considered, organizational commitment and posttraumatic growth have not been addressed, and a model has not been statistically tested.

The Proposed Research

Purpose

The objective of the proposed research is to identify the means through which emergency service providers' perceived organizational climate might impact upon the development of traumatic stress and posttraumatic growth. For the sake of brevity, the term organizational climate will refer to those variables of interest in the present research, including perceived organizational stress, perceived organizational support, and perceived team cohesion. Organizational commitment will also be included in the
present study. In order to collectively refer to organizational commitment along with the organizational climate the term, the organizational variables, will be used. These terms are not meant to imply a hierarchical structure or latent variable.

Importance

**Academic Contributions.** The proposed research has the potential to make multiple contributions within both academic and emergency service settings. First, the framework will make a significant contribution to theory building in this research domain as the existing theories tend to lack continuity, clarity, and specificity. Second, existing research has been predominantly exploratory, has not inspected more complex relationships (e.g., mediating and moderating relationships), and has neglected positive outcomes, such as posttraumatic growth. In contrast, the proposed research will seek to identify the specific pathways through which the organizational climate and organizational commitment might prevent and engender the development of traumatic stress and posttraumatic growth. These findings have the potential to extend current knowledge and direct future research. By exploring the role of posttraumatic growth, the proposed research strives to achieve a more balanced understanding of the experiences of emergency service providers.

**Applied Contributions.** The results have the potential to impact preventative and curative measures for traumatic stress among emergency service providers. Addressing traumatic stress retrospectively can be costly, time-consuming, and does not eliminate many negative consequences of traumatic stress. By identifying factors in the organizational climate that prevent and engender the development of traumatic stress and the precise means through which this occurs, specific interventions can be recommended to address traumatic stress in a more proactive fashion. Furthermore, the proposed research will examine individual’s perceptions and will not be an objective quality review. This is because individuals’ perceptions have the potential to be more amenable, cost-effective, and feasible to change compared to large-scale, objective organizational change. Throughout the literature, traumatic stress has been related to increased leaves of absence, job ineffectiveness, and compromised job safety (Shalev & Yehuda, 1998). Stress has been more costly for organizations compared to work-related accidents as measured by health care costs, absenteeism, and lost productivity (Schultz & Schultz, 1998). For these reasons, the findings of the present study could be used to improve our health care delivery system, the health and safety of its front-line workers, and the productivity, profit, and functioning of emergency service organizations.
Chapter II: Literature Review

Trauma Exposure among Emergency Service Providers

Throughout the course of routine job duties, emergency service providers are repeatedly exposed to traumatic events. The types of traumatic events can include natural disasters, violent assaults, terrorism, medical emergencies, motor vehicle accidents, death, mutilated bodies, multiple casualties, mass destruction, line-of-duty death, and a myriad of other events. Emergency service providers have identified the following as major stressors: handling dead bodies, exposure to dangerous situations, witnessing property and environmental loss, working under suboptimal conditions, physical strain, and conveying tragic news to victims' family or friends (Raphael, 1986). Seventy percent of emergency service providers reported that the deaths of young people, multiple deaths, and sights and smells of dead people were significant sources of strain (Raphael, Singh, Bradbury, & Lambert, 1983-1984).

Exposure to traumatic events is also a function of the type of emergency service. Two recent studies compared Canadian paramedics' and firefighters' exposure to potentially traumatic events. The paramedics reported significantly higher rates of exposure to death of patients, multiple casualties, deaths of children, and violence against others compared to the firefighters (Regehr, Goldberg, & Hughes, 2002). Over 80% of paramedics reported exposure to each one of these events. Over 40% of the firefighters had been exposed to violence against others, multiple casualties, and the death of a child whereas 30% had been exposed to the death of a person in their care (Regehr, Hill, & Glancy, 2000). The degree of distress resulting from trauma exposure also varies across the types of emergency services. The event causing the most distress among both paramedics and firefighters was the death of a child, followed by the death of a colleague in the line of duty and the death of a patient for whom the paramedic or firefighter was responsible (Regehr & Bober, 2005). Emergency service providers indicated that "the impact of child deaths and severe abuse of children was due to the fact that they were unable to understand why something like this might have occurred" (Regehr & Bober, p. 16). A greater percentage of firefighters reported "significant emotional distress" following the death of a patient and death of a child compared to the paramedics (Regehr & Bober, 2005, p.14). A greater percentage of the paramedics reported distress following a line of duty death, violence against self, violence against other, near death, and multiple casualties compared to the firefighters (Regehr & Bober, 2005).
Direct Trauma Exposure

During routine job duties emergency service providers can experience trauma through any of the following channels: (1) direct exposure, (2) secondary exposure, or (3) vicarious exposure. In the case of direct trauma exposure, emergency service providers experience the trauma themselves. Conservative estimates suggest that 80% to 90% of paramedics and firefighters directly experience at least one critical incident in the line of duty within a single year (Beaton & Murphy, 1990). A common example of direct trauma exposure is when emergency service providers attend an emergency that is still in progress. In this circumstance, they are present while the event is transpiring and experience the event directly. The firefighters who attended the World Trade Center attacks on September 11, 2001 are an historic example because many arrived on-scene while the attacks were still in progress. Direct exposure can also occur when emergency service providers become victims; that is, when they are exposed to events that threaten their survival. Increasingly common examples are those emergency service providers who have been assaulted while on the job. Conservative estimates suggest that almost 70% of paramedics have been assaulted while on the job and over 50% have been in situations where they felt that their lives were at risk (Regehr & Bober, 2005). Beaton and Murphy (1993) surveyed Washington State firefighters and paramedics and found that nearly 80% reported some apprehension regarding their personal safety while on the job because of dangerous job conditions.

Secondary Trauma Exposure

Emergency service providers can be exposed to traumatic events through secondary channels. Secondary exposure refers to helping or wanting to help a traumatized or suffering person who has experienced an event outside the range of usual human experiences that would be markedly distressing to almost anyone (Morrissette, 2004). The event might be a serious threat to a traumatized person or sudden destruction to a traumatized person's environment (Morrissette, 2004). Secondary exposure is the most common type of trauma exposure among emergency service providers (Figley, 1995). An example of secondary exposure among emergency service providers is witnessing the line-of-duty injury or death of a co-worker. It is important to note that secondary exposure can also result from low-profile, individual tragedies that connect with an emergency responder at a highly personal level. Two examples are the death of a lonely elderly person or the despair of a suicide victim (Regehr & Bober, 2005). Regehr and Bober (2005) interviewed police, fire, and
ambulance providers and asked them to identify events that other people would classify as traumatic. Many identified those events that involved much “blood and gore” but explained that those were not the events that led to the most distress (Regehr & Bober, 2005, p. 21). The events that reportedly led to the most distress were those that connected with the emergency service provider on an emotional level (Regehr & Bober, 2005). It has been proposed that secondary exposure may be exacerbated when emergency service providers want to help someone but their ability to accomplish this is compromised in some way, such as when they are unable to carry out the tasks for which they were trained and prepared to complete (Raphael et al., 1983-1984; Wilkinson & Vera, 1985). Examples are when paramedics are faced with multiple casualties and the challenges of triaging, when they must wait for patients to be extricated from vehicles or debris, or when they cannot enter an emergency scene because of imminent danger.

**Vicarious Trauma Exposure**

Emergency providers can also experience traumatic events vicariously. Vicarious exposure entails learning about a traumatic event that was experienced by another person (Figley, 1989). Vicarious exposure can include graphic descriptions of violent events, discussion of sights and smells, and exposure to the realities of people’s cruelty to one another (Pearlman & Saakvitne, 1995). For example, emergency service providers can experience emotional distress after learning about a catastrophe involving a fellow co-worker. Common sources of vicarious exposure among emergency service providers are when traumatic events are discussed during conversations among co-workers, training sessions, or group deb briefings. Vicarious exposure can also occur when an emergency service provider identified with a victim that he/she was assisting. In this case, the victim is seen as similar to the emergency service provider, his/her children, family, friends, or significant others (Hartsough & Myers, 1985). It has been proposed that in some cases, a person who is vicariously exposed to traumatic events can experience more stress than the actual victim (Figley, 1989).

**Problematic Reactions to Trauma Exposure**

*Normal versus Problematic Reactions*

Throughout the existing literature, initial responses to trauma have been regarded as normal responses to abnormal events (Shalev, 1996). Initial responses to trauma are common and can include symptoms such as nightmares, hypervigilance, and flashback episodes. For most people these reactions are manageable and subside over time (Shalev, 1996). A small proportion of individuals develop problematic reactions to
trauma, which are characterized by severe and/or chronic symptoms. Given that few people develop problematic reactions following trauma exposure, these reactions are not an inevitable consequence of trauma exposure (Herman, 1997). Specific problematic reactions following trauma exposure will be detailed below. However, it is important to consider that many individuals might not meet the criteria for a specific psychological disorder but nevertheless, might experience symptoms that are clinically significant and warrant attention.

Acute and Posttraumatic Stress Disorders

The *DSM-IV-TR* (APA, 2000) identifies Acute Stress Disorder (ASD) and PTSD as two psychiatric disorders that can result from exposure to traumatic events. ASD pertains to those reactions that occur between 24 hours and one month following trauma exposure. PTSD pertains to those reactions that occur at least one month after trauma exposure. The following paragraph summarizes the remaining criteria for ASD and PTSD based on the *DSM-IV-TR*.

The criteria for ASD and PTSD both require that an individual experienced, witnessed, or was confronted with an event that involved actual death, threatened death, serious injury, or threat to the physical integrity of oneself or others. Both diagnoses require that an individual's response involved intense fear, helplessness, or horror. The following criteria differ between ASD and PTSD. The criteria for ASD require the presence of at least three dissociative symptoms (e.g., absence of emotional responsiveness, derealization, or depersonalization), one or more reexperiencing symptoms (e.g., recurrent images, thoughts, or flashback episodes), marked avoidance of stimuli that arouse recollections of the trauma (e.g., efforts to avoid thoughts, feelings, or conversations associated with the trauma), and marked symptoms of anxiety or increased arousal (e.g., difficulty sleeping, irritability, or hypervigilance). The criteria for PTSD require the presence of at least one symptom of re-experiencing, three or more symptoms of persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness, and two or more symptoms of increased arousal. In addition, the criteria for ASD and PTSD both require that the disturbance cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Disorders of Extreme Stress not otherwise Specified or Complex PTSD

Disorders of Extreme Stress Not Otherwise Specified (DESNOS) and Complex PTSD are terms that have been used to describe a complex form of posttraumatic
disorder in survivors of prolonged, repeated trauma (Herman, 1997; Herman, 1995). Examples are hostages, prisoners of war, concentration-camp survivors, childhood abuse, sexual exploitation, and domestic battering. Herman (1997) explained that the current diagnostic criteria for PTSD do not fit accurately enough with the symptomatology experienced by survivors of prolonged, repeated trauma. This is because the existing diagnostic criteria for PTSD are predominantly derived from survivors of circumscribed traumatic events (Herman, 1997).

In survivors of prolonged, repeated trauma the symptom pattern is often far more complex, including characteristic personality changes (e.g., problems with relationships and identity). Herman (1997) explained that DESNOS is characterized by alterations in affect regulation (e.g., persistent dysphoria, chronic suicidal preoccupation), consciousness (e.g., transient dissociative episodes, depersonalization), self-perception (e.g., sense of helplessness or paralysis of initiative, shame, guilt, and self-blame), perceptions of the perpetrator (e.g., preoccupation with the relationship with the perpetrator, unrealistic attribution of total power to the perpetrator), relations with others (e.g., isolation and withdrawal, disruption in intimate relationships), and systems of meaning (e.g., loss of faith, sense of hopelessness and despair). DESNOS is not recognized as a formal diagnosis but is described in the associated features section of PTSD in the DSM-IV-TR.

Compassion Fatigue and Secondary Traumatic Stress Disorder

Compassion fatigue refers to the tendency for individuals in helping professions (e.g., therapists, social workers, emergency service providers) to become upset or traumatized as a result of helping or wanting to help a traumatized or suffering person or of knowing about a traumatizing event experienced by a significant other (Figley, 1995). Figley (1995) coined the term, Secondary Traumatic Stress Disorder, to describe the psychological consequences of compassion fatigue. Secondary Traumatic Stress Disorder is similar to PTSD, except the symptoms result from knowledge about a traumatizing event experienced by a significant other and the symptoms are directly connected to the significant other (Figley, 1995). As an example, an individual with PTSD might experience recollections of the event. In the case of Secondary Traumatic Stress Disorder, an individual might experience recollections of the event or of the traumatized or suffering person (Morrisette, 2004). Secondary Traumatic Stress Disorder can emerge suddenly and is associated with a sense of helplessness, confusion, and isolation from supporters. Secondary Traumatic Stress Disorder has not
been identified as a psychiatric disorder in the *DSM-IV-TR*. Instead, individuals could be diagnosed with either ASD or PTSD if they met the criteria for either disorder (APA, 2000).

**Burnout**

This term has been used to describe a state of physical, emotional, and mental exhaustion resulting from long term involvement in emotionally demanding situations (Pines & Aronson, 1988). Burnout has been used to depict a degenerative process; a loss of faith in the enterprise of helping others (Morrissette, 2004). Burnout is characterized by excessive distancing from patients, impaired competence, low energy, increased irritability with supporters, and other signs of impairment and depression (Figley, 1995). According to Figley (1995), burnout is a gradual process that commences with job strain, followed by erosion of idealism, and finally a void of achievement. Burnout can result from a variety of situations and is not exclusively related to trauma exposure (Morrissette, 2004).

Consistent with the existing literature, the symptoms of ASD, PTSD, DESNOS, and STSD will be collectively referred to as “traumatic stress.” Burnout will be excluded from this terminology because it is not exclusively related to trauma exposure.

**Consequences of Trauma Exposure and Traumatic Stress**

**Negative Outcomes**

Traumatic stress has been associated with short-term and long-term emotional and physical disorders, difficulties in interpersonal relationships, substance abuse, burnout, and shortened careers (Beaton & Murphy, 1995). For example, one study sampled emergency service providers who witnessed massive death and mutilation following an airplane crash. Results revealed that 80% experienced changes in sleep and appetite, 53% had moderately severe scores on a measure of global distress, and 40% showed changes in social interactions (Taylor & Fraser, 1982). Other symptoms that have been associated with traumatic stress include impaired information processing, a sense of alienation, isolation, withdrawal, loss of confidence, guilt, feelings of insanity, loss of control, and suicidal ideation (Dunning & Silva, 1980; Solomon & Horn, 1986; van der Kolk, 1988). Traumatic stress has also been related to leaves of absence, job ineffectiveness, and compromised job safety (Shalev & Yehuda, 1998). The occurrence of traumatic stress among emergency service providers has also been associated with increased rates of physiological problems that are known to be related to stress, such as
cardiovascular problems, duodenal ulcers, pulmonary embolisms and infarctions, and cirrhosis of the liver (Figley, 1995).

Positive Outcomes: Posttraumatic Growth

There is overwhelming evidence that trauma exposure can lead to negative consequences. However, there has been increasing awareness that trauma exposure does not inevitably or exclusively lead to negative outcomes. A growing body of research has found that some individuals are able to obtain positive outcomes amidst trauma and tragedy. Recognition of these positive outcomes in conjunction with awareness of the potential detrimental impact of traumatic stress symptoms gleans a more balanced understanding of the impact of traumatic events.

Various authors have noted that traumatic events can present the opportunity for growth and positive change, otherwise referred to as posttraumatic growth (Caplan, 1964; Tedeschi & Calhoun, 1996). The experience of a highly stressful or traumatic event is a necessary precondition for posttraumatic growth (Tedeschi & Calhoun, 1995). Examples of posttraumatic growth include positive changes in relating to others, new possibilities in life, a sense of increased personal strength, spiritual change, and greater appreciation of life (Tedeschi & Calhoun, 1996). Positive changes in relating to others can include benefits such as increased closeness, emotionality, compassion, education, and acceptance of interpersonal support. New possibilities in life may include outcomes such as a new direction in life, new interests, new opportunities, and willingness to try new activities. A sense of improved personal strength can be observed through increased self-reliance, self-efficacy in the face of difficulties, confidence, and acceptance. Spiritual change includes an understanding of spiritual matters as well as stronger religious faith. Greater appreciation of life includes clearer priorities and appreciation of life. Tedeschi and Calhoun (2004, p. 5) poignantly explained that “growth...does not occur as a direct result of trauma. It is the individual’s struggle with the new reality in the aftermath of the trauma that is crucial in determining the extent to which PTG occurs.” Accordingly, posttraumatic growth is conceptualized as a longer-term, positive outcome of trauma exposure that reflects a sense of meaning and growth derived from past traumatic events.

Consistent with the conceptualization of posttraumatic growth, various studies have found that some people may perceive at least some good as having emerged from a traumatic event. Positive outcomes have been found in victims of rape (Burt & Katz, 1987; Veronen & Kilpatrick, 1983), incest (Silver, Boon, & Stones, 1983), bereavement
Posttraumatic growth has been correlated with traumatic stress symptoms; however, the nature of this relationship seems to hinge on the point at which posttraumatic growth is measured and the degree of psychological symptoms. Butler et al. (2005) found that posttraumatic growth increased as PTSD symptoms increased. However, the positive relationship between PTSD and posttraumatic growth held only up to a point, which was roughly at the measure's cut-off score for probable PTSD diagnosis. After that point, increasing PTSD symptoms were associated with a decline in reported growth. Based on these findings, Butler (2007, p. 373) concluded the following in a review article:

Although catastrophic events may be necessary for growth, there appears to be a limited range of experience that can prompt or perhaps facilitate it. Outside those bounds, levels may be insufficient to spur growth or, conversely, they may be so intense that they overwhelm natural mechanisms of psychological adaptation and healing.

In other words, some level of trauma exposure is required to develop posttraumatic growth. However, the presence of chronic and/or severe traumatic stress symptoms may overwhelm individuals' capacity for coping with that event or subsequent stressors. In turn, the likelihood of developing bonafide growth or experiential meaning (i.e., posttraumatic growth) from the traumatic event decreases. Similar to Butler's conceptualization, Lechner, Carver, Antoni, Weaver, and Phillips (2006) found that a curvilinear function better characterized some of the growth-outcome relationships. A meta-analysis conducted by Helgeson et al. (2006) revealed that the time since the traumatic event functioned as a moderator, such that posttraumatic growth was more likely to be related to positive psychological outcomes as the time since the event increased. In summation, posttraumatic growth is most likely to be reported under
conditions of mild to moderate traumatic stress and as the time since the traumatic event increases.

Trends and Prevalence of Traumatic Stress

Prevalence of Traumatic Stress Symptoms

Considering the chronic trauma exposure endured by emergency service providers, it is not surprising that the majority of these individuals experience at least one symptom of traumatic stress at some point in their careers. Existing research has found that 80% of emergency service providers reported experiencing at least one traumatic stress symptom following an apartment building explosion (Durham, McCammon, & Allison, 1985). Another study found that 70% of emergency providers showed signs of traumatic stress following a train disaster (Raphael et al., 1983-1984). Horowitz, Wilner, and Alvarez (1979) found that 87% of emergency service providers reported experiencing at least one symptom of traumatic stress following a line of duty incident within the past year. Therefore, experiencing at least one symptom of traumatic stress seems to be commonplace among emergency service providers.

Symptom Severity

While the percentage of emergency service providers who report at least one symptom of traumatic stress is substantial, the severity of these symptoms portrays a different picture. In contrast to trauma victims within the general population, traumatic stress symptoms experienced by emergency service providers are generally mild to moderate (Figley, 1995). Horowitz et al. (1979) found that emergency service providers experienced traumatic stress symptoms that were in the mild to moderate range. More specifically, their symptoms were approximately one standard deviation below that of the untreated male standardization sample (Horowitz et al., 1979). Despite more frequent and severe trauma exposure among emergency service providers compared to the general population, emergency service providers tend to experience less severe symptoms of traumatic stress.

Prevalence of PTSD

The existing trauma literature has revealed that many people experience at least one symptom of traumatic stress but few develop PTSD following a traumatic event (Breslau, 1998). This is evidenced by the fact that a large number of survivors of the most extreme traumas in history have not met the criteria for PTSD. For example, it has been found that 15.2% of male Vietnam veterans suffer from prolonged PTSD (Kulka et al., 1990). However, the risk of PTSD is greater for events intentionally perpetrated by
humans, such as combat, rape, and violent crime (Herman, 1997). By showing that a relatively small proportion of those exposed to severe stressors develop PTSD, epidemiologic studies have challenged the conceptualization of PTSD as a normal response to abnormal stress (Breslau & Davis, 1987; McFarlane, 1990; Yehuda & McFarlane, 1995). In summation, PTSD is not an inevitable consequence of trauma exposure.

**Course of Symptoms**

The overall trend in traumatic stress symptoms is that the intensity of symptoms tends to decrease over time along with the number of people disabled by their symptoms (Rothbaum & Foa, 1993). This means that many people experience symptoms of traumatic stress but their symptoms improve and become less debilitating over time. In contrast, those individuals who develop PTSD seem to have a different prognosis. Distress among those who develop PTSD tends to persist over time and some symptoms actually increase (Shalev, Peri, Caneti, & Schreiber, 1996). As time goes on the rate of recovery declines and reaches a plateau between one and six years following trauma exposure (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). These findings suggest that those people whose symptoms do not subside within one to six years are unlikely to recover. Furthermore, the effects of multiple traumatic events may accumulate over time, worsening traumatic stress symptoms and the prognosis for recovery (Fischer, 1991). Together, these findings indicate that few people who develop PTSD spontaneously recover, particularly in the case of multiple trauma exposure.

**Traumatic Stress among Emergency Service Providers**

Consistent with the existing literature, most emergency service providers do not have a diagnosable, trauma-related mental disorder (Hyttten & Hasle, 1989). Many emergency service providers report experiencing at least one symptom of traumatic stress; however, many fewer meet the criteria for PTSD (Mitchell & Bray, 1990). Existing research has found that approximately 18% of emergency service providers develop PTSD (e.g., Al-Naser & Everly, 1999; Wagner, Heinrichs, & Ehlert, 1998). In contrast, it has been estimated that between 15% and 25% of those exposed to trauma in the general population develop PTSD (Breslau, 1998). While estimates vary across research studies, the trend seems to be that the prevalence of PTSD among emergency service providers seems to be less than or similar to the prevalence of PTSD in the general population (Breslau, 1998). These findings are surprising considering the chronic nature of trauma exposure experienced by emergency service providers as well as the
potentially cumulative effects of multiple trauma exposure; factors that are commonly associated with increased rates of PTSD in the general population. Together the findings indicate the following: (1) the majority of emergency service providers experience sub-clinical levels of traumatic stress while only a small percentage meet the criteria for PTSD and (2) the percentage of emergency providers who develop PTSD is fairly similar to the general population. This presents a paradox; emergency service providers experience trauma that is generally more severe and frequent than the general population but the prevalence of PTSD is similar to the general population.

Factors in the Development of Traumatic Stress

Variability in Responses to Traumatic Events

Epidemiologic studies have challenged the conceptualization of PTSD as a normal response to abnormal stress (Breslau & Davis, 1987; McFarlane, 1990; Yehuda & McFarlane, 1995). In doing so, these studies have led trauma theorists to acknowledge that people are highly individual in their responses to trauma (Regehr & Bober, 2005). This means that several individuals who were exposed to the same traumatic event could experience different symptoms that are of varying severity and duration. Numerous researchers have attempted to elucidate the factors that account for the variability in the development of traumatic stress.

Characteristics of Trauma Exposure

A large body of research has focused on the characteristics of trauma exposure. Characteristics of trauma exposure that have been related to the development of traumatic stress include the intensity of the traumatic event (Foy, Sipprelle, Rueger, & Carroll, 1984), duration of the trauma (Solkoff, Gray, & Keill, 1986), dangerousness (Kilpatrick et al., 1989), concern for personal injury (Armstrong, O'Callahan, & Marmar, 1991), preparation for the event (Chemtob et al., 1990), mission failure (Raphael et al., 1983-1984), and threat to one's life (Maida, Gordon, Steinberg, & Gordon, 1989). Histories of early traumatization, previous exposure to similar trauma, and pre-existing life stress have also been related to the development of traumatic stress (Dutton, Smolensky, Lorimor, Hsi & Leach, 1978; Shalev, 1996). Most consistently, the perceived severity of trauma exposure (i.e., subjective appraisal) versus an objective evaluation has been related to the development of traumatic stress (e.g., Bryant, & Harvey, 1995; Hafeez, 2003; Hyman, 2004; Michelson, June, Vives, Testa, & Marchione, 1998; Walen, Oliver, Groessl, Cronan, & Rodriguez, 2001; Williams, 1993).
Vulnerability and Risk Factors

Much research has investigated the role of individual differences in the development of traumatic stress, suggesting that some people might have a “pretrauma vulnerability” (Shalev, 1996, p. 79). Psychiatric factors have included the presence of acute traumatic stress symptoms, prior exposure to traumatic events, a pre-existing psychiatric disorder, more protracted traumatic stress symptoms, and prior mental disorders (Figley, 1995; McFarlane, 1988d; Shalev, 1996). Biological risk factors have included a family history of mental disorders (Davidson, Smith, & Kudler, 1989), female gender (Breslau & Davis, 1992), middle age (Freedy, Resnick, & Kilpatrick, 1992; Jones, 1985), heightened conditionability (Peri, Ben-Shachar, & Shalev, 1994), neuroendocrine vulnerability (Yehuda, Giller, & Mason, 1993), and diminished hippocampal volume (Gurvits et al., 1996). Personality traits, such as neuroticism and introversion, have also been found to increase the risk of traumatic stress (McFarlane, 1988a-d; Mitchell & Bray, 1990; Shalev, 1996). Studies have also found that coping strategies such as searching for meaning, seeking emotional support, seeking mastery, and a sense of humour serve as protective factors against the development of traumatic stress (Hartsough & Myers, 1985; McCammon, Durham, Allison, & Williamson, 1988). Other individually-based factors that have been shown to contribute to traumatic stress include role conflict (Murphy, 1991), means of meaning acquisition (Gersons, 1989), feelings of insecurity, lack of personal control, and alienation from others (Regehr et al., 2000). Most consistently, research has demonstrated that a strong, positive social support network serves as a protective factor against the development of traumatic stress (Figley, 1995; Regehr et al., 2000; Regehr, Hemsworth, & Hill; 2001). Social support networks can include family members, spouses, partners, children, friends, co-workers, supervisors, mental health professionals, and organizations.

Theories of Stress

The above literature review articulated various potentially traumatic events along with psychological consequences that may follow such events. However, the precise mechanism through which such events result in various psychological symptoms is less clear. A plethora of stress models have been proposed throughout the health psychology and organizational psychology literature. Some stress models have also spawned from the clinical psychology literature. As a result of the proliferation of these models, a comprehensive review is beyond the scope of this proposal. However, some of the more influential models within the field of psychology will be reviewed in the following
paragraphs. These models have the potential to aid in our understanding of how emergency service providers respond to stressors, regardless of whether those stressors are traumatic in nature or part of their daily organizational climate. A brief summary of the stress theories is provided in Appendix B, along with the implications and relevance of these theories to the hypotheses in the present study.

Biological Models

**General Adaptation Syndrome.** Hans Selye proposed the General Adaptation Syndrome (GAS), which is a three-stage model of stress response (Selye, 1936; Selye, 1976). The first stage is alarm and mobilization, which prepares the body for action. This stage involves the activation of the hypothalamus-sympathetic nervous system and the hypothalamus-adrenal medulla pathways to produce catecholamines. The second stage is resistance in which the body adapts to stressors through the activation of the pituitary-adrenal cortex pathway to produce glucocorticoids. The final stage is exhaustion. Exhaustion occurs if stress remains or increases in intensity because the body's adaptive capabilities are depleted over time. Selye proposed that continued exhaustion would result in diseases of adaptation, such as cardiovascular disease or gastrointestinal disorders (Sulsky & Smith, 2005). Selye added that if all adaptive resources are depleted, biochemical and physiological activity would resurge and result in death of the organism if unabated (Sulsky & Smith, 2005).

Selye proposed that the nonspecificity of the stress response was what made the stress response so potent. This means that each stressful experience has the same physiological impact; depletion of the organism's adaptive resources. Selye also argued that the outcomes of stress are exacerbated by the passage of time as well as the number and severity of stressors. More specifically, Selye proposed that increases in the quantity, severity, or duration of stressors would result in increased stress.

Various aspects of Selye's theory have been challenged throughout the years (e.g., the role of some physical stressors, Mason, 1971; biochemical differences between fear and anger, Ax, 1953; Gray, 1978; and Selye's neglect of psychological factors, Cox, 1978). Nonetheless, Selye's work has been very influential within the field of psychology, particularly in terms of the cumulative effects of stressors as well as the non-specific response to stressors.

General Life Models

**Cognitive-Transactional Model.** This model assumes that stress is "neither an environmental stimulus, a characteristic of the person, nor a response but a relationship
between demands and the power to deal with them without unreasonable or destructive
costs" (Coyne & Holroyd, 1982, p. 108; Lazarus & Launier, 1978). This model proposes
that a stressor cannot be labelled a stressor unless it is perceived as such by the
individual (Sulsky & Smith, 2005). Lazarus and Folkman (1984) identified two appraisal
processes that lead to stress: primary and secondary appraisals. Primary appraisals
determine whether an event is perceived as irrelevant, benign-positive, or stressful.
Stressful primary appraisals are subdivided into harm-loss appraisals (e.g., potential loss
of someone or something important), threat appraisals (e.g., when a person perceives
that his/her ability to deal with a situation is insufficient), and challenge appraisals (i.e.,
situations that are perceived to be demanding but within the person’s capabilities).
Secondary appraisals determine whether the individual has the ability to deal with
harm/loss by identifying available coping options and the potential to successfully
implement the preferred coping response (Lazarus & Folkman, 1984). Lazarus stated
that both person and situation factors can influence the appraisal process. For example,
it was suggested that greater ambiguity, less control, and less social support would be
more likely to result in a threat appraisal (Sulsky & Smith, 2005). Lazarus and colleagues
argued that person and environmental variables are causal antecedents that are
mediated by appraisals and coping to produce immediate effects (i.e., affect and
physiological changes) and subsequent long-term effects (i.e., physiological well-being
and somatic health/illness; Lazarus, Delongis, Folkman, & Gruen, 1985).

Lazarus’ model has made a tremendous contribution to the literature, particularly
because of its generality and universality (Sulsky & Smith, 2005). This model recognized
that individuals are not merely in a state of physiological auto-pilot but instead,
individuals have the capacity to alter their responses to stress (Regehr & Bober, 2005).
This model has been criticized because of its focus on the individual and its general
scope (e.g., Brief & George, 1991). Nonetheless, this model has been adopted in some
form by most contemporary stress researchers (e.g., Eaton & Bradley, 2008; Field,
Norman, & Barton, 2008; Maguen et al., 2008; Mikolajczak & Luminet, 2008; Sulsky &
Smith, 2005).

Conflict-Theory Model. This model was put forth by Irving Janis, who proposed
that people can tolerate stress better if they are provided with realistic warnings and
preparations about the impending stressor, regardless of the nature of that stressor
(Janis, 1958; Janis & Mann, 1977). The antecedent conditions include information about
the impending danger and any factors relevant to the stressor. The mediating processes

18
were proposed to include psychological states experienced while anticipating and coping with the stressor. Janis stated that these processes involved a series of sequential questions (e.g., "Are the risks serious if I don't change;" Sulsky & Smith, 2005, p. 32) as well as various coping patterns. The consequences in Janis' model referred to the outcomes of the person's anticipation of and interaction with the stressor.

The main shortcoming of this model is that people are usually not rational, predictable, or sequential decision makers when they are under stress (Stevenson, Busemeyer, & Naylor, 1990). As stated by Sulsky and Smith (2005, p. 32), the "model is really a decision-making (not a stress) model that treats stress as an interference or nuisance factor."

**Conservation of Resources (COR) Theory.** In Hobfoll's (1989, 2002) COR theory, the loss and gain of personal, social, and material resources are key determinants in the experience of stress. The central premise of this theory is that "...People have an innate as well as learned desire to conserve the quality and quantity of their resources and to limit any state that may jeopardize the security of these resources" (Hobfoll, 1988, p. 25). The COR theory predicts that stress results from the threat of a possible loss in resources, failure to obtain expected resources, actual loss of resources, or lack of resource gain following investment of resources (Hobfoll, 1989; Sulsky & Smith, 2005). This model conceptualizes resources as falling into one of four categories: objects (i.e., material possessions, such as food and housing), personal characteristics (i.e., traits, such as self-esteem or career-orientation), conditions (i.e., states that are considered to be desirable and worth seeking, such as social support or interpersonal relationships), and energies (i.e., the means through which resources are obtained, such as knowledge or skills; Sulsky & Smith, 2005).

In support of the COR theory, it has been found that losses following exposure to extreme stress predicted ongoing distress among disaster victims (Ironson, Wynings, Schneiderman, Baum, Rodrigues, et al., 1997; Holahan, 1999; King, King, Foy, Keane, & Fairbank, 1999; Norris & Kaniasty, 1996; Monnier, Resnick, Kilpatrick, & Seals, 2002). Furthermore, this theory predicts that individual losses may quickly cascade into a series of losses without the timely injection of resources (Regehr & Bober, 2005). This means that the loss of a single resource may lead to additional resource loss. For example, a firefighter injured in the line of duty would be expected to experience loss of health, which could be followed by additional losses in areas such as work and personal roles, self-esteem and confidence, and interpersonal relationships. Another important aspect of
this theory is that the community (e.g., work community) that we belong to influences what resources we value and aim to protect (Regehr & Bober, 2005). The COR theory predicts that the loss of valued resources will lead to greater distress than the loss of less valued resources (Regehr & Bober, 2005).

The COR theory suggests that people build and retain resources in order to enhance the self and maximize positive resources (Hobfoll, 1998). In other words, the accumulation of resources incurs positive benefits for the individual. This theory also predicts that people may experience resource gains or positive outcomes following perceived or actual resources loss (Hobfoll, 1998). For example, trauma survivors might learn new coping skills or develop a new perspective on life (Calhoun & Tedeschi, 1998; Monnier & Hobfoll, 2000; Sattler, Kaiser, & Hittner, 2000). These examples of positive outcomes are analogous to concept, posttraumatic growth, which was discussed earlier.

Job-Related Models

**Person-Environment Fit (PE) Model.** The PE model attempts to explain how characteristics of the employee and work environment jointly determine worker well-being. Stress is viewed as a lack of correspondence between the characteristics of the person and environment (Sulsky & Smith, 2005). Several PE models have been proposed (e.g., Dawis & Lofquist, 1984; French, Rodgers, & Cobb, 1974; Levi, 1972; McGrath, 1976; Pervin, 1967). PE fit can be viewed from the perspective of employees' needs (needs-supplies fit) as well as the demands of the job environment (demands-abilities fit). Needs-supplies fit refers to the extent to which an employee's needs (e.g., need to use skills) are met by the work environment's supplies and opportunities (e.g., opportunity to use those skills). Demands-abilities fit describes the degree to which job demands are met by an employee's skills and abilities. Fit is determined by the discrepancy between the environment and the person. Objective fit influences subjective fit, which directly affects our well-being (i.e., emotional, physiological, and cognitive strains and behavioural responses; French et al., 1974; Harrison, 1978). The model proposes that these strains are risk factors for subsequent illness (French et al., 1974).

Despite its intuitive appeal and research support, Ganster and Schaubroeck (1991) argued that the utility of the theory is limited because it focuses on the processes whereby strain occurs but does not articulate specific work characteristics that produce strain. Most commonly, methodological concerns have been raised that range from the measurement of objective versus subjective fit, the use of difference or discrepancy measures, lack of attention to the difference between needs-supplies fit versus
demands-abilities fit, to the precise work characteristics that ought to be considered (Sulsky & Smith, 2005).

**Job Demands-Job Decision Latitude Model.** This model was developed by Robert Karasek (1979) and has been called the most important model of organizational stress in the latter part of the twentieth century (Sulsky & Smith, 2005). This model proposes that psychological strain develops from the joint effects of job demands and the decision latitude available to the worker. More specifically, the model proposes that strain will be the greatest when job demands are high and decision latitude is low (Karasek, 1979). Job demands include physical and psychological demands on individual workers, including workload pace and intensity (Regehr & Bober, 2005). Decision latitude is defined as discretion in decision making and how much control a person has over his/her work (i.e., autonomy), the extent to which skills are utilized, and the variety of tasks within a job (Regehr & Bober, 2005; Sulsky & Smith, 2005).

Criticisms have included the inconsistent operationalization of decision latitude and mixed evidence for the interactive effect between job demands and decision latitude (Ganster & Shaubroeck, 1991). Evidence has been stronger for the main effects of job demands and decision latitude whereby high job demands and low decision latitude individually predict strain (Fletcher & Jones, 1993; Ganster & Fusilier, 1989; Kasl, 1989). The model has also been criticized because of its narrow focus and neglect of other potential sources of organizational stress (Sulsky & Smith, 2005). More recently, the impact of social support upon this model has been investigated (Johnson, 1989; Parkes, Mendham, & von Rabenau, 1994). Parkes et al. (1994) found that high levels of somatic symptoms were associated with high demands-low control when social support was low. In other words, the relationship was moderated by social support (Parkes et al., 1994).

**Process Model of Task Performance.** This model proposes that task performance is a function of perceived stress and actual task ability and difficulty (McGrath, 1976). Perceived stress is determined by the perceived importance of the task and the perceived ability to perform the task (Sulsky & Smith, 2005). Actual task difficulty is based on the objective situation, which affects perceived task difficulty. Together these result in the perceived stressfulness of the task, which is followed by a decision process to determine required coping responses, evaluation of selected behaviours, and the outcome process (i.e., whether the selected behaviours produce the desired outcome). The outcome then feeds back into the stressor. Given that this model is focused on task performance versus psychological symptomatology, it will not be reviewed further.
Integrative Transactional Process Model. This model incorporates environmental stressors (e.g., role in organization, job qualities, and relationships), time (duration of stress), individuals' perceptions (impacted by factors such as experience and personality), individual characteristics (e.g., lifestyle, social support, and physical condition), the stress response, and stress outcomes (Sulsky & Smith, 2005). The strengths of this model are its inclusion of time in the stress process and the central role of individual and contextual differences (Bacharach & Bamberger, 1992). This model has been criticized because it fails to provide enough specificity to allow researchers to generate concrete hypotheses (Sulsky & Smith, 2005).

Stressor and Response-Specific Models

Various models have been proposed throughout the literature that focus on particular stressors, groups of stressors, select responses, or specific populations (Sparks & Cooper, 1999). For example, models have been proposed for the specific impact of downsizing and layoffs (Harris, Heller, & Braddock, 1988; Leana & Feldman, 1988), for specific work stressors (e.g., Cooper & Cartwright, 1994), stressors specific to police officers (Hart, Wearing, & Heady, 1995), and specific outcomes such as unsafe behaviours and accidents (Murphy, DuBois, & Hurrell, 1986).

Emergency Service Providers’ Organizational Climate

Importance

Although traumatic events have traditionally gained much attention in the stress literature, the above described stress theories emphasize that smaller scale events or conditions can also function as stressors. Over recent years, there has been growing awareness that emergency service providers’ organizational climate has the potential to function as a stressor, above and beyond the traumatic events that they experience through their jobs. The organizational climate is particularly important to consider in this sample because emergency service providers operate within an overarching organizational climate that impacts most aspects of their routine job duties. Furthermore, trauma exposure among emergency providers occurs within the context of routine job duties. The following pages will identify common and plausible sources of stress experienced by emergency service providers.

Potential Stressors

Emergency service providers spend the vast majority of their working hours attending emergencies and transporting patients. They regularly work under conditions that contain an inherent element of danger, which can rapidly change from seemingly
routine to extremely lethal. Nevertheless, exposure to traumatic events and danger represents only a portion of the workplace influences upon emergency service providers. The organizations to which they belong greatly contribute to their daily experiences. For example, emergency service organizations are responsible for employment, training, education, rules, regulations, certification, protocols, safety, equipment, dispatch, vehicle upkeep, paperwork, audits, discipline, promotion, payroll, and other aspects of routine employment. Any of these responsibilities has the potential to create additional stress for emergency service providers. Organizational stressors can be further compounded by factors unique to emergency service providers such as dangerous working conditions, repeated trauma exposure, shift work, verbal abuse by patients, hospital delays, poor traffic and weather conditions, managing large crowds, dealing with media, and court subpoenas (Regehr & Bober, 2005). A further complication is that the emergency services are classified as an essential service. This precludes emergency service providers from privileges such as strike action and refusal to work under certain conditions (e.g. during the Severe Acute Respiratory Syndrome outbreak in 2003). Despite increased awareness of the multiple job stressors faced by emergency service providers, their precise role in the development and etiology of traumatic stress remains unclear (Figley, 1995).

Organizational Stress

Sources of Organizational Stress
Organizational stress refers to those aspects of employees' jobs or organization that can lead to adverse physical and psychological reactions (Byron & Peterson, 2002; Greenberg et al., 2000). Organizational stress can include small daily hassles (e.g., equipment malfunction, disagreement with a fellow co-worker, uncooperative patients, poor road conditions), chronic stressors (e.g., job ambiguity, supervisory problems, lack of control, unpredictability), major work-related events (e.g., layoff, reprimand, major physical injury), or large-scale events (e.g., workplace explosion; Allen, 1995).

Consequences of Organizational Stress
Organizational stress can affect employees' physical and emotional well-being as well as their ability to perform their jobs (Schultz & Schultz, 1988). The consequences of organizational stress have been known to include psychological symptoms such as depression, anxiety, and irritability as well as physiological responses such as ulcers, colitis, coronary heart disease, arthritis, skin diseases, allergies, headaches, neck and lower back pain, and cancer (Allen, 1995; Schultz & Schultz, 1998). In 1982
approximately 44% of all firefighter fatalities were at least partially attributable to the consequences of occupational stress (Anson & Bloom, 1988). It has been estimated that for every worker killed in the line of duty, at least 50 employees suffer from some kind of heart disease (Schultz & Schultz, 1998). The consequences of organizational stress can also include lowered productivity and motivation as well as increased errors, accidents, turnover, and counterproductive behaviour (Schultz & Schultz, 1998). According to Schultz and Schultz (1998), stress is more costly for organizations compared to work-related accidents, as measured by health care costs, absenteeism, and decreased productivity.

**Multiple Stressors and Prolonged Stress**

The consequences of organizational stress are compounded when multiple stressors or prolonged stress are considered (e.g., Schaubroeck & Ganster, 1993). The consequences of multiple stressors and prolonged stress are highly relevant to emergency service providers who must balance multiple stressors such as patient care, emergency scene management, dispatch, protocols, traffic, coworkers, and off-load delays along with various ongoing organizational stressors. Emergency service providers are also faced with prolonged exposure to stress, considering the length of a single shift and the frequency of days worked. Organizational stress among emergency service providers has been found to include a lack of control over work demands, lack of resources to work effectively, high demand, unpredictability, high levels of accountability, low levels of autonomy, and reviews or audits (Regehr & Bober, 2005).

**Variability in Responses to Organizational Stress**

While stress is unequivocally a negative job consequence, it does not affect everyone in the same way. Research has demonstrated that individuals in high stress jobs can respond idiosyncratically to stress. Whereas some individuals in high stress jobs are negatively affected by stress, others are apparently unaffected (Schultz & Schultz, 1998). It has been proposed that those who are very satisfied with their jobs do not suffer the harmful effects of stress, whereas those who are dissatisfied with their jobs experience stress-related effects (Schultz & Schultz, 1998). It has been suggested that jobs that afford more autonomy and control are less susceptible to the negative consequences of stress (e.g., Fox, Dwyer, & Ganster, 1993). Degree of control includes factors such as workplace events, job demands, authority to make decisions, and freedom to set work schedules. Other factors that have been identified as precipitants to job stress are work overload, work underload, organizational change, role ambiguity, role
conflict, poor leadership behaviours, problems of career development, performance
appraisal, responsibility for subordinates, coworkers who are experiencing stress,
repetition, monotony, noise, lack of challenge, and shift work (Schultz & Schultz, 1998).
A series of studies by Regehr and colleagues have found that low organizational or co­
worker support, a poor climate of safety, and a sense of unfairness are sources of
organizational stress among emergency service provides (Regehr & Bober, 2005).

The Organizational Climate: Other Variables of Interest

Whereas organizational stress has gained much attention in the literature,
positive aspects of the organizational climate and their impact have received less
attention. This reflects the tendency for research to focus on identifying problems and
proposing solutions. However, it is important to also understand how positive aspects of
the organizational climate might protect against the development of negative
consequences (e.g., psychopathology) and promote positive outcomes (e.g., growth and
development). The following section will review specific variables of interest, including
perceived organizational support, team cohesion, and organizational commitment.
Perceived organizational support and team cohesion reflect positive aspects of the
organizational climate and will be included in the measures and planned analyses of the
present study. Organizational commitment reflects employees' internal sense of
attachment to their organization, rather than external influences in the organizational
climate. Organizational commitment will also be included in the measures and planned
analyses of the present study. The hypothesized relationship between these variables
and traumatic stress and posttraumatic growth will be reviewed in the section titled, The
Present Study: Hypotheses.

Perceived Organizational Support

Description and Origins. Perceived organizational support refers to the degree to
which an employee feels supported by his/her organization. Employees develop global
beliefs concerning the extent to which their organization values their contributions and
cares about their well-being (Eisenberger, Huntington, & Hutchison, 1986). Perceived
organizational support is influenced by the manner in which organizations treat their
employees as well as employees' interpretation of the organization's motives underlying
that treatment (Hutchison & Sowa, 1986). Perceived organizational support has been
shown to be influenced by beliefs about whether the organization recognized
contributions and could be depended on to fulfil promises (Buchanan, 1974), trust in
management to treat employees fairly (Cook & Wall, 1980), perceived fairness of pay
(Patchen, 1960), and perceptions of the organization as benign, cooperative, or consistent (Hrebiniak, 1974). A meta-analysis conducted by Rhoades and Eisenberger (2002) found that three types of beneficial treatment received by employees were associated with perceived organizational support: fairness, supervisor support, and organizational rewards and favorable job conditions.

**Benefits of Organizational Support.** Perceived organizational support has been strongly related to organizational commitment, diligence, innovative management, job performance, attendance, (Eisenberger, Fasolo, & Davis-LaMastro, 1990; Hutchison & Sowa, 1986), and organizational citizenship behaviours (Shore & Wayne, 1993). Employees' commitment to an organization is strongly influenced by their perception of the organization's commitment to them (Hutchison & Sowa, 1986). In order for employees to feel attached to their organizations, they must feel that their organization is supportive. Perceived organizational support increases employees' affective attachment to an organization as well as their expectancy that greater effort toward meeting organizational goals will be rewarded (Hutchison & Sowa, 1986). In doing so, perceived organizational support has the potential to increase employees' work-related efforts (Hutchison & Sowa, 1986). A meta-analysis by Rhoades and Eisenberger (2002) revealed that perceived organizational support is related to outcomes favorable to employees (e.g., job satisfaction and positive mood) and organizations (e.g., affective commitment, improved performance, and less withdrawal behavior).

**Team Cohesion**

**Definitions.** Teams are a special kind of group in which members focus on collective, rather than individual work products, are mutually accountable to each other, and share a common commitment to purpose (Greenberg et al., 2000). Carron, Brawley, and Widmeyer (1998, p. 213) defined team cohesion as "a dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs." Team cohesion consists of team integration and individual attraction to the team (Carron, Widmeyer, & Brawley, 1985).

**Benefits of Team Cohesion.** Team cohesion has been associated with effective group communication (Rosenfeld & Gilbert, 1989; Weinberg, 1979) and heightened performance (Evans & Dion, 1991; Gully, Devine, & Whitney, 1995; Mullen & Copper, 1994). Team cohesion has also been found to yield improvements in quality, customer service, productivity, and the bottom line (Greenberg et al., 2000). Wech, Mossholder,
Steel, and Bennett (1998) proposed that highly cohesive groups tend to perform better because they are more committed to attaining group goals and are more willing to assist each other since they are more sensitive to others in the group. In most organizations, teams create the potential for an organization to generate greater outputs with no increase in inputs (Robbins & Langton 2003).

Organizational Commitment

Types of Organizational Commitment. Organizational commitment refers to the degree and type of psychological identification with an organization (Greenberg et al., 2000). Organizational commitment includes acceptance of the values and goals of the organization, willingness to exert effort for the organization, and having a strong desire to remain affiliated with the organization (Mowday, Porter, & Steers, 1982; Mowday, Steers, & Porter, 1979). Initially three types of organizational commitment were recognized: affective commitment, continuance commitment, and normative commitment (Dunham, Grube, & Castaneda, 1994; Meyer & Allen, 1991; Meyer, Allen, & Smith, 1993). More recently, it has been found that the following two sub-dimensions better characterize the continuance commitment dimension: high-sacrifice commitment and low-alternative commitment (e.g., Bentein, Vandenberg, Vandenberghe, & Stinglhamber, 2005; Dunham et al., 1994; Hackett, Bycio, & Hausdorf, 1994; McGee & Ford, 1987; Meyer, Allen, & Gellatly, 1990; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002). As such, four types of organizational commitment are currently recognized: affective commitment, high-sacrifice commitment, low-alternative commitment, and normative commitment.

Descriptions and Origins. Affective commitment refers to the degree to which an employee identifies with an organization, internalizes its values and attitudes, and complies with its demands (Schultz & Schultz, 1998). Affective commitment is influenced by job conditions and met expectations (Spector, 2000). In continuance commitment there is no personal identification with the organization (Schultz & Schultz, 1998). Instead, employees are bound by peripheral factors that would not continue if the employee quit. Examples include pension plans, seniority, and medical insurance. Continuance commitment is influenced by benefits accrued from working for the organization and by the lack of alternative jobs (Spector, 2000). As discussed above, continuance commitment is better represented by high-sacrifice commitment, which refers to the perceived sacrifice associated with leaving an organization, and low-alternative commitment, which refers to costs resulting from a lack of employment.
alternatives (Bentein et al., 2005; Dunham et al., 1994; Hackett et al., 1994; McGee & Ford, 1987; Meyer et al., 1990). Normative commitment refers to a sense of obligation to remain with the organization (Spector, 2000). Normative commitment develops from employees’ personal values and from the obligations that they feel toward their employer (Spector, 2000). Perceived obligations are influenced by favours or benefits received from the organization, such as monetary benefits or specific skills training (Spector, 2000). The differences between the types of organizational commitment are highlighted by Meyer et al. (1993, p. 539): “Employees with strong affective commitment remain with the organization because they want to, those with strong continuance commitment remain because they need to, and those with strong normative commitment remain because they feel they ought to do so.”

Research Findings. A meta-analysis revealed that organizational commitment correlated positively with job satisfaction, attendance, skill variety, autonomy, job scope, job performance, and age but correlated negatively with employee turnover, role ambiguity, and role conflict (Mathieu & Zajac, 1990). Employees who are older, have been employed by an organization for more than two years, and have a high need for achievement tend to rate high in organizational commitment (O’Driscoll, 1987). Organizational factors that have been associated with high organizational commitment include job enrichment, autonomy, opportunity to use skills, positive attitudes toward the work group, and perceived organizational support (Schultz & Schultz, 1998). Research has demonstrated that job performance is positively correlated with affective commitment but is negatively correlated with continuance commitment (Meyer, Paunonen, Gellatly, Goffin, & Jackson, 1989). Affective commitment has been found to be highly correlated with perceived organizational support (Shore & Tetrick, 1991). Existing research has demonstrated that organizational commitment can be weakened by factors such as financial strain (Brett, Cron, & Slocum, 1995), career plateaus (Stout, Slocum, & Cron, 1988), employment with a government agency (Zeffane, 1994), and ethnic and gender composition of the workgroup (Fagenson, 1993; Milliken & Martins, 1996). Organizational commitment has been found to be negatively correlated with turnover (Hackett et al., 1994; Jaros, Jermier, Koehler, & Sincich, 1993).

Relationship between the Organizational Climate and Traumatic Stress
The means through which organizations might increase or decrease stress and lead to physiological, psychological, and organizational outcomes remains unclear. This is particularly true in populations that are infrequently researched, such as emergency
service providers. Some studies have examined emergency service providers' perceptions of their organizational climate; however, much of the existing research has neglected to investigate its precise relationship to the presence of traumatic stress.

The impetus for examining emergency service providers' organizational climate and organizational commitment comes from the following sources. First, emergency service providers are exposed to traumatic events throughout the course of routine job duties. Intuitively, their organizational climate and organizational commitment would have at least some role in their ongoing employment experiences (i.e., exposure to traumatic events). Second, existing research suggests that factors, other than the characteristics of trauma exposure, are likely involved in the development of traumatic stress among emergency service providers. Third, some authors have proposed that such a relationship exists and the relationship between isolated organizational variables and traumatic stress has been investigated in some studies. The relevant literature will be respectively reviewed in the following paragraphs.

**Intuitive Appeal**

Emergency service providers are exposed to trauma through routine job duties. Their organizations are responsible for a myriad of factors, ranging from equipment and training to rules to regulations, which influence their ability to manage emergency scenes and care for their patients. Logically, their organizational climate and organizational commitment would have at least some bearing on daily stress and their ability to function in the face of repeated trauma exposure. This is further supported by discourse with emergency service providers. Emergency service providers seem reluctant and unwilling to label the psychological impact of their work as the source of their distress. "When EMS [emergency medical service] people admit to emotional exhaustion, they usually deny that it comes from the tragedy and horror they witness. Instead, they blame the hassles" (Graham, 1981, p. 28). As stated by Sparrius (1992, p. 87), "despite the presence of some unique individual, intergroup, and extraorganizational stressors, the most striking finding was the level of negativity accorded by the respondents to organization-based stressors."

**Implication of Factors other than Trauma Exposure**

It has become increasingly apparent that factors, other than traumatic events, might be important in the development of traumatic stress among emergency service providers. One example is a study by Wagner, Compas, and Howell (1988). These authors investigated the roles of daily and major negative events on psychological
symptomatology using a sample of students who were transitioning from high school to college. They found that negative daily events mediated the relationship between major negative events and psychological symptomatology. In contrast, major life events alone were not significant predictors of later psychological symptomatology. These findings suggest that factors, other than major events, might be involved in the development of psychological symptomatology. Furthermore, crime and trauma statistics do not directly account for the prevalence of psychological symptomatology among emergency service providers. Sixty police officers in Paris committed suicide in the year 1995, which was double the rate of New York (Simons, 1996). Given that Paris has consistently lower crime rates compared to New York, the findings cannot be solely attributed to exposure to crime. Factors that were proposed to explain this statistic included job demands, working conditions, organizational support, public interactions, family concerns, budget cuts, decreased salaries, fewer workers, and lack of resources. Based on a sample of 2000 paramedics and firefighters, Beaton and Murphy (1993) found 14 statistically distinct occupational stressors, of which past critical incidents was just one stressor. These findings suggest that although major traumatic events are important, emergency service providers contend with an array of other stressors that might also play a role in the development of traumatic stress.

**Purported Relationship**

Existing theory has purported that a relationship between the organizational climate of emergency service providers and traumatic stress exists. Figley proposed that emergency service providers are “exposed to a variety of job-related stressors in addition to workplace trauma that may compound or interact with traumatic stressors” (Figley, 1995, p. 65). He explained that emergency service providers respond to traumatic events differently than the general population because they view exposure to traumatic events as part of their work. Figley argued that stress reactions are likely to be less severe when events are perceived to be a fact of everyday life and are not perceived to be traumatic. This has been supported by findings indicating that multiple traumas have a cumulative effect on the general population whereas research on paramedics and firefighters has not documented any effect of years of service on any measures of stress employed (Figley, 1995; Hytten & Hasle, 1989). Matteson and Ivancevich (1987) proposed an organizational systems model in which organizational factors were pre-existing factors that mediated the development of general stress. Traumatic stress, specifically, was not included in this model. Woodall (1999) proposed
an organizationally-based critical incident stress mitigation and management program to
dress organizationally-related concerns among emergency service providers. Regehr
and Bober (2005, p. 5) stated, “trauma is a result of the interplay between an event, the
person encountering the event, the public and media response to the event, the
organization in which responders work, and the supports and life that they have outside
of the workplace.” These authors proposed that individual responses to traumatic events
are best understood through an ecological framework, which refers to the broad context
of an individual’s life experience. Although the existing literature emphasizes the
importance of investigating emergency service providers’ organizational climate, two
shortcomings remain. First, the precise pathways have not been statistically tested using
samples of emergency service providers. Second, much of the theoretical literature
globally refers to the role of organizations but does not detail specific variables for
investigation.

Research Findings

Specific aspects of emergency service providers’ organizational climate and the
relationship to traumatic stress has been proposed and/or tested in some studies.
Hartsough and Myers (1985) found that the following variables influenced emergency
service providers’ reactions to traumatic events: (1) authority and chain of command, (2)
size of the organization, (3) role conflicts and ambiguities, and (4) rank of the crisis
worker. It has also been reported that experience, training, role orientation, and second-
stated that the cultural norms among emergency service providers dictate, to some
extent, how an individual should and will respond to traumatic events. It has also been
proposed that situations that threaten the team of emergency service providers lead to
were involved in public inquiries surrounding “deaths in care.” She found that feelings of
being unprotected, attacked, and presumed guilty of incompetence or negligence were
intensified by an unsupportive organizational response. Regehr and Bober (2005)
proposed that factors in the workplace such as high effort/low reward, high demand/low
control, role ambiguity, low organizational/co-worker support, a poor climate of safety,
and a sense of unfairness can lead to the accumulation of stress (Regehr & Bober,
2005). Together, these authors have identified specific aspects of emergency service
providers’ organizational environment that might impact their reactions to traumatic
events. However, many aspects of emergency service providers’ organizational climate
have not been explored, positive aspects of the organizational climate have been neglected, posttraumatic growth has not been considered, and a model has not been statistically tested.

In an unpublished dissertation, Allen (1995) investigated the relationship between chronic stressors (i.e., role conflict, job ambiguity, workload, and interpersonal conflict) and traumatic job events among firefighters. It was hypothesized that “the relationship between chronic occupational stressors and strains (would) be weaker than the relationship between traumatic job events and strains among firefighters” (Allen, 1995, p. 24). It was also hypothesized that traumatic job events would moderate the relationship between chronic stress and physical and psychological strains. The first hypothesis was not supported by the findings. Instead, the correlations between chronic occupational stressors and strains were stronger than the correlations between traumatic job events and strains among firefighters. The second hypothesis was also unsupported by the results. Thirty-two moderated regression tests were used to examine this hypothesis. Eleven were statistically significant but only two were in the hypothesized direction and both of these related to physical symptoms, not PTSD. Together these findings suggest that chronic organizational stressors might be more important in the development of traumatic stress than traumatic job events. This is consistent with the findings from other samples. For example, Schonfeld (1992) found that job strain was more strongly related to psychological distress compared to episodic stressors among a sample of teachers. Another study found that daily hassles predicted psychological symptoms better than major life events among a sample of engineers (Keenan & Newton, 1985).

One noteworthy study investigated child welfare workers’ perceived organizational environment and its role in the development of distress (Regehr et al., 2004). The latent construct, “organizational factors,” was estimated by three measurement variables: perceived support of the union, perceived support of management, and ongoing workload stressors (e.g., amount of work, documentation requirements, difficult or disruptive clients, organizational change, and conflicts with staff). Individual, incident, and “organizational factors” combined to produce “posttraumatic stress distress” (Regehr et al., 2004, p. 331). The organizational factors had a significant direct effect on distress and also had the strongest association with distress, compared to individual and incident factors. Social support from supervisors and managers was found to be of limited value in relieving symptoms of distress in this study. This study is noteworthy for multiple reasons: it tested a model of the relationship
between the organizational climate and distress, investigated specific and numerous aspects of the organizational climate, and demonstrated the importance of the organizational climate in the development of distress. However, the limitations of this study were as follows. A measure of organizational stress was created for the purpose of the study and only minimal psychometric properties were reported. In addition, distress was operationalized to include symptoms of intrusion, avoidance, and depression but this omits some symptoms that are characteristic of traumatic stress (e.g., hypervigilance). Finally, more complex relationships (e.g., mediating and moderating pathways) between the variables were not investigated.

After reviewing the literature the following questions remain: (1) to what extent would the findings generalize to traumatic stress, (2) would the findings generalize to emergency service providers, (3) what results would be obtained if additional aspects of the organizational climate were included, (4) what results would be obtained if employees' internal experience (e.g., organizational commitment) was included, (5) precisely how does the organizational climate and organizational commitment impact the development of traumatic stress, and (5) does the organizational climate and organizational commitment contribute to positive outcomes following trauma exposure?

The Present Study: Hypotheses

Overview

Although the aforementioned stress models have propelled our understanding of the development of stress, the application of those models to the present study is fairly limited. Those models that are broader in scope incur the advantage of generalizability; however, the lack of specificity tends to limit hypotheses that can be drawn from those models. The remaining models have not been extended to address workplace trauma specifically. Nonetheless, it is important to recall that exposure to traumatic events occurs within the context of emergency service providers’ routine job duties. Accordingly, trauma exposure is one of many possible work-related stressors faced by emergency service providers. When considered in this fashion, the various stress theories are applicable to both emergency service providers’ organizational climate as well as the traumatic events that they experience.

Throughout the literature, humans have been understood to function in a state of psychological equilibrium, in which they respond to and resolve problems encountered throughout their daily lives (Callahan, 1998). Exposure to stressors may overwhelm and disrupt this equilibrium and may deplete an organism’s resources for coping with those
stressors, resulting in a host of possible stress-related symptoms (Antonovsky 1981; Callahan, 1998; Selye, 1976). Accordingly, negative aspects of the organizational climate (e.g., work overload, lack of organizational support) should be associated with greater traumatic stress symptoms. Furthermore, COR theory proposes that people may also experience resource gains (i.e., positive outcomes) following perceived or actual resource loss (Hobfoll, 1998). Similarly, the accumulation of organizational resources following trauma exposure (e.g., team cohesion and organizational support) should be related to positive outcomes (i.e., posttraumatic growth). Therefore, a more positive organizational climate should be positively correlated with posttraumatic growth.

Selye (1976) also argued that the outcomes of stress are compounded by the quantity and severity of stressors. Similarly, the presence of organizational stress following a traumatic event would be expected to exacerbate emergency service providers’ response to traumatic events. That is, an individual who experiences a traumatic event coupled with high organizational stress would be expected to experience greater traumatic stress symptoms compared to situations of low organizational stress. In contrast, the acquisition of resources following a traumatic event would be expected to combat or buffer resource loss associated with that traumatic event. As an example, the acquisition of support following a traumatic event would be expected to lessen the negative impact of that traumatic event thereby decreasing the likelihood of traumatic stress symptoms but increasing the likelihood of posttraumatic growth. In summation, emergency service providers’ organizational climate might moderate the relationship between trauma exposure, traumatic stress, and posttraumatic growth.

Although most stress models and research findings suggest that the organizational environment might moderate the relationship between trauma exposure and traumatic stress, there is some indication that the organizational climate might mediate this relationship. For example, Matteson and Ivancevich (1987) proposed an organizational systems model in which organizational factors mediated the development of general stress. Regehr, Johanis, Dimitropoulos, Bartram, and Hope (2003) found that organizational support mediated the relationship between public inquiries following a traumatic work-related event and distress among police officers. In a study of police officers undergoing a public inquiry, it was found that the quality of organizational support mediated the negative consequences of the inquiry, including reactions that were “consistent with posttraumatic stress” (Regehr et al., 2003). Lazarus indicated that an event or situation could be appraised as either a stressor or a challenge such that the
former is associated with stress reactions and the latter is associated with growth and development (Lazarus & Folkman, 1984). Accordingly, aspects of the organizational climate that might impact appraisals of traumatic events (e.g., team cohesion and as such, discussions among coworkers about the traumatic events that they experienced) might mediate the development of traumatic stress and posttraumatic growth. However, given the lack of consensus as to whether organizationally-related factors function as moderators or mediators, those variables that do not moderate the relationship between trauma exposure and traumatic stress will be inspected for mediating relationships. Detailed rationale and hypotheses are presented below and a summary of the hypotheses are presented in Table 1.

**Specific Aspects of Organizational Stress**

**Role Clarity.** A study of occupational stress among police officers found that ambiguity was related to psychological strain (Kaufmann & Beehr, 1989). Similarly, role ambiguity was related to stress in the Canadian military (Dobreva-Martinova, Villeneuve, Strickland, & Matheson, 2002). Consistent with these findings, it is hypothesized that role clarity will be negatively correlated with traumatic stress, such that greater role clarity will be associated with less traumatic stress. Furthermore, some authors have suggested that role clarity might moderate the relationship between trauma exposure and stress. For example, Sulky and Smith (2005, p. 28) stated that “ambiguity generally intensifies threat if potential harm is perceived.” Lazarus and Folkman (1984) suggested that greater ambiguity would be more likely to result in a threat appraisal, which is responsible for producing immediate and long-term effects such as traumatic stress (Lazarus et al., 1985). Based on these findings, the following hypotheses are proposed:

**Hypothesis 1a:** Less role clarity will be associated with greater traumatic stress but less posttraumatic growth.

**Hypothesis 1b:** Role clarity will moderate the relationship between trauma exposure and traumatic stress as well as the relationship between trauma exposure and posttraumatic growth.

**Utilization of Skills.** In French et al.’s (1974) model of PE fit, it was proposed that employees’ well-being is directly affected by the extent to which an employee’s needs (e.g., need to use skills) are met by the work environment’s supplies and opportunities (e.g., opportunity to use those skills). A study of occupational stress among police officers found that under-utilization of skills was related to psychological strain.
(Kaufmann & Beehr, 1989). Given that increases in the quantity of stressors increases the likelihood of stress-related symptoms (Selye, 1936; Selye, 1976; van der Kolk et al., 1996), it is hypothesized that trauma exposure in conjunction with under-utilization of skills will lead to greater traumatic stress symptoms compared to trauma exposure in conjunction with skill utilization.

_Hypothesis 2a:_ Under-utilization of skills will be associated with greater traumatic stress symptoms and less posttraumatic growth.

_Hypothesis 2b:_ Utilization of skills will moderate the relationship between trauma exposure and traumatic stress as well as the relationship between trauma exposure and posttraumatic growth.

_Autonomy._ Karasek (1979) proposed that psychological strain develops from the joint effects of job demands (i.e., heavy workload) and the decision latitude available to the worker (i.e., autonomy). Although Karasek (1979) specified that strain would occur when job demands are high and decision latitude is low, evidence has been stronger for the main effects versus interaction (Fletcher & Jones, 1993; Ganster & Fusilier, 1989; Kasl, 1989). This means that autonomy individually predicts strain. Consistent with these findings, it is hypothesized that greater autonomy will be related to less traumatic stress symptoms. As discussed above, the presence of an additional stressor, such as low autonomy, would be expected to magnify traumatic stress symptoms and thereby moderate the relationship between trauma exposure and traumatic stress.

_Hypothesis 3a:_ Less autonomy will be associated with greater traumatic stress symptoms and less posttraumatic growth.

_Hypothesis 3b:_ Autonomy will moderate the relationship between trauma exposure and traumatic stress as well as the relationship between trauma exposure and posttraumatic growth.

_Workload._ An investigation of work roles and work stress in the Canadian military found that work overload was related to greater stress (Dobreva-Martinova et al., 2002). Similarly, a study of occupational stress among police officers found that work overload was related to psychological strain (Kaufmann & Beehr, 1989). While these findings suggest that greater workload is associated with greater stress, Regehr and Bober (2005) suggested that boredom could also be a source of stress among firefighters. Similarly, work underload has been associated with greater stress (Schultz & Schultz,
As such, it is hypothesized that both low and high workload will be associated with greater traumatic stress symptoms. Consistent with the stress theories of Fletcher and Jones (1993), Ganster and Fusilier (1989), and Kasl (1989), it is hypothesized that workload will moderate the relationship between trauma exposure and traumatic stress symptoms.

**Hypothesis 4a:** The relationship between workload and traumatic stress will be represented by a curvilinear relationship, such that low and high workload will be associated with greater traumatic stress but less posttraumatic growth.

**Hypothesis 4b:** Workload will moderate the relationship between trauma exposure and traumatic stress as well as the relationship between trauma exposure and posttraumatic growth.

**Perceived Organizational Support**

Lazarus and colleagues stated that job conditions are more likely to be appraised as highly stressful in the absence of social support versus in the presence of social support (Lazarus et al., 1985). Hobfoll (1988) argued that stress results from the threat of a possible loss of resources, failure to obtain expected resources, or actual loss of resources. Hobfoll (1988) identified social support and interpersonal relationships as two resources, meaning that low social support or poor interpersonal relationships would be expected to increase stress. Similarly, low organizational and co-worker support has been shown to lead to the accumulation of stress among emergency service providers (Regehr & Bober, 2005). It has also been demonstrated that perceptions of an unsupportive organizational response can intensify feelings of being unprotected, attacked, and presumed guilty of incompetence or negligence (Regehr, 2003). While investigating the Job Demands-Job Decision Latitude Model, Parkes et al. (1994) found that high levels of somatic symptoms were associated with high demands-low control only when social support was low. In other words, this relationship was moderated by social support (Parkes et al., 1994). Furthermore, it has been well-documented that social support among emergency service providers buffers the effects of traumatic stress (e.g., Galloucis, 1995; Regehr & Bober, 2005). This means that emergency service providers experience fewer traumatic stress symptoms when they receive greater social support. Given that organizational support is one type of social support, the following hypothesis is proposed:
Hypothesis 5a: Greater perceived organizational support will be associated with less traumatic stress symptoms and greater posttraumatic growth.

Hypothesis 5b: Perceived organizational support will moderate the relationship between trauma exposure and traumatic stress as well as the relationship between trauma exposure and posttraumatic growth.

Team Cohesion

Team cohesion has been defined as “a dynamic process that is reflected in the tendency of a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs” (Carron et al., p. 213). This definition emphasizes group allegiance, which suggests that team cohesion reflects the valence of coworker relationships and could serve as a means of social support. It is possible that team cohesion might buffer the effects of trauma exposure, as a result of the associated positive interpersonal interactions or social support. It is likely that team cohesion also facilitates coping strategies employed by emergency service providers (e.g., group debriefings, social events, and discussions with coworkers). In doing so, team cohesion could increase social support, which has been shown to reduce traumatic stress symptoms among emergency service personnel (Regehr & Bober, 2005). Similarly, it was found that survivors of the Oklahoma City bombing who had more supportive co-workers were less likely to report PTSD symptoms (Tucker, Pfefferbaum, Nixon, & Dickson, 2000).

Even in circumstances where team members are not perceived to be supportive or cordial, it is possible that team cohesion could decrease stress in occupations that are highly dependent on teamwork. Team cohesion among emergency service personnel would likely facilitate routine job duties, thus eliminating or reducing potential stressors. For example, team cohesion could facilitate problem solving about the etiology of medical emergencies, patient care, and emergency scene management. The COR theory is also relevant here, as it purports that the loss of valued resources will lead to greater distress than loss of less valued resources (Regehr & Bober, 2005). Team cohesion is highly valued among emergency service providers, who rely upon team members to effectively manage emergencies and protect their personal safety while on the job. The loss of this valued resource would be expected to increase stress and thereby compound the effects of trauma exposure, resulting in greater traumatic stress symptoms (Selye, 1936; Selye, 1976; van der Kolk et al., 1996). Therefore, the following hypotheses are proposed:
Hypothesis 6a: Greater team cohesion will be related to less traumatic stress symptoms and greater posttraumatic growth.

Hypothesis 6b: Team cohesion will moderate the relationship between trauma exposure and traumatic stress as well as the relationship between trauma exposure and posttraumatic growth.

Organizational Commitment

According to Lazarus' Cognitive-Transactional Model, person factors can influence the initial appraisal process (Lazarus & Folkman, 1984). Lazarus stated, "if a person is committed to a course of action because the outcome is important to him...he will probably appraise a stressor as a challenge rather than a threat" (Sulsky & Smith, 2005, p. 28). Lazarus further specified that stressors that are appraised as challenges rather than threats are associated with growth and development. Given that organizational commitment represents acceptance of the values and goals of the organization, willingness to exert effort for the organization, and having a strong desire to remain affiliated with the organization, Lazarus' theory would be expected to apply to organizational commitment. Organizational commitment might influence emergency service providers' appraisals of potentially traumatic events and thereby, the traumatic stress symptoms that they experience. For example, emergency service providers with greater organizational commitment might respond differently to traumatic events (e.g., with exhilaration or a sense of duty) compared to those with less organizational commitment (e.g., with a sense of obligation). Accordingly, it is expected that affective and normative commitment will be negatively correlated with traumatic stress and will mediate the relationship between trauma exposure and traumatic stress. However, high-sacrifice commitment and low-alternative commitment reflect potentially stressful reasons for remaining with an organization and have been negatively correlated with favourable outcomes (Meyer et al., 1989). This suggests that high sacrifice and low alternative commitment will be positively correlated with traumatic stress but will also mediate the relationship between trauma exposure and traumatic stress.

In support of these hypotheses, variables that have been correlated with organizational commitment have also been correlated with stress among emergency service providers, including job satisfaction, job performance, role ambiguity, and role conflict (Allen, 1995; Brough, 2004; Regehr, 2003; Regehr & Bober, 2005). Existing research has also demonstrated that organizational commitment in hospital employees eased the effects of organizational stress resulting from budget cutbacks, closure of
hospital units, and discussion of layoffs (Begley & Czajka, 1993). Finally, it is also possible that organizational commitment might motivate emergency service providers to remain with the organization and persevere in spite of chronic trauma exposure. In order to remain with the organization, psychological health would need to be maintained. This could motivate emergency service providers to remedy the effects of traumatic stress through various coping mechanisms, such as reliance on support networks.

**Hypothesis 7a:** Greater affective and normative commitment will be related to less traumatic stress and greater posttraumatic growth.

**Hypothesis 7b:** Affective and normative commitment will mediate the relationship between trauma exposure and traumatic stress as well as the relationship between trauma exposure and posttraumatic growth.

**Hypothesis 8a:** Greater high-sacrifice and low-alternative commitment will be associated with greater traumatic stress and less posttraumatic growth.

**Hypothesis 8b:** High-sacrifice and low-alternative commitment will each mediate the relationship between trauma exposure and traumatic stress as well as the relationship between trauma exposure and posttraumatic growth.

**Absenteeism**

Throughout the literature it has been demonstrated that organizational stress is related to absenteeism. It was found that characteristics of the organization predicted the onset of stressors, which in turn, predicted outcomes such as absenteeism among a sample of nurses (Hemingway & Smith, 1999). Similarly, daily job-related hassles have been found to be related to absenteeism and physical health (Ivancevich, 1986). Absenteeism seems like a plausible outcome of traumatic stress when considering the specific symptoms and their associated consequences, such as emotional numbing, social withdrawal, avoidance, irritability, fearfulness, depression, sleep disturbances, substance use, and an array of minor to serious health problems (Bhagat, 1983; Tucker et al., 2000; Ursano, Fullerton, & Norwood, 2002). It is likely that the aforementioned consequences of traumatic stress would negatively impact one’s functioning at work, which could result in increased absenteeism. Similarly, Shalev and Yehuda (1998) noted that traumatic stress has been related to leaves of absence. Therefore, it is hypothesized that absenteeism will be positively related to both traumatic stress and negative aspects of the organizational environment.
Hypothesis 9: Greater absenteeism will be correlated with greater role conflict, high-sacrifice commitment, and low-alternative commitment, low and high workload, and less utilization of skills, autonomy, perceived organizational support, team cohesion, affective commitment, and normative commitment.

Hypothesis 10: Traumatic stress will be positively correlated with absenteeism, such that greater traumatic stress will be related to greater absenteeism.

Relative Contributions of Trauma Exposure and the Organizational Environment

Consistent with previous research (e.g., Allen, 1995; Baker & Williams, 2001; Regehr et al., 2004), the organizational variables should predict traumatic stress symptoms above and beyond trauma exposure. It is hypothesized that participants’ perceptions of their organizational climate in addition to their organizational commitment will predict a greater percentage of the variance in traumatic stress symptoms, compared to perceived trauma exposure.

Hypothesis 11: Organizational stress, perceived organizational support, team cohesion, and organizational commitment will predict a significant percentage of the variance in traumatic stress symptoms, above and beyond trauma exposure.

The aforementioned hypotheses are provided in Table 1 on the following page. The hypotheses are summarized consecutively in terms of their hypothesized relationship with traumatic stress, hypothesized relationship with posttraumatic growth, and hypothesized mediating or moderating role in the relationship between trauma exposure, traumatic stress, and posttraumatic growth.
Table 1. 
Summary of Hypotheses

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Organizational Variable</th>
<th>Hypothesized Relationships</th>
<th>Relationship with Traumatic Stress</th>
<th>Relationship with Posttraumatic Growth</th>
<th>Mediating or Moderating Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Role clarity</td>
<td></td>
<td>Negative</td>
<td>Positive</td>
<td>Moderating</td>
</tr>
<tr>
<td>2</td>
<td>Utilization of skills</td>
<td></td>
<td>Negative</td>
<td>Positive</td>
<td>Moderating</td>
</tr>
<tr>
<td>3</td>
<td>Autonomy</td>
<td></td>
<td>Negative</td>
<td>Positive</td>
<td>Moderating</td>
</tr>
<tr>
<td>4</td>
<td>Workload</td>
<td>Curvilinear</td>
<td>Curvilinear</td>
<td></td>
<td>Moderating</td>
</tr>
<tr>
<td>5</td>
<td>Organizational support</td>
<td>Negative</td>
<td>Positive</td>
<td></td>
<td>Moderating</td>
</tr>
<tr>
<td>6</td>
<td>Team cohesion</td>
<td>Negative</td>
<td>Positive</td>
<td></td>
<td>Moderating</td>
</tr>
<tr>
<td>7</td>
<td>Affective commitment</td>
<td>Negative</td>
<td>Positive</td>
<td></td>
<td>Mediating</td>
</tr>
<tr>
<td>7</td>
<td>Normative commitment</td>
<td>Negative</td>
<td>Positive</td>
<td></td>
<td>Mediating</td>
</tr>
<tr>
<td>8</td>
<td>High sacrifice commitment</td>
<td>Positive</td>
<td>Negative</td>
<td></td>
<td>Mediating</td>
</tr>
<tr>
<td>8</td>
<td>Low alternative commitment</td>
<td>Positive</td>
<td>Negative</td>
<td></td>
<td>Mediating</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Variables</th>
<th>Hypothesized Relationships</th>
<th>Relationship with Traumatic Stress</th>
<th>Other</th>
<th>Positive correlations with organizational stress and high sacrifice and low alternative commitment. Negative correlations with organizational support, team cohesion, and affective and normative commitment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 &amp; 10</td>
<td>Absenteeism</td>
<td>Positive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Organizational variables and trauma exposure</td>
<td>Organizational variables will predict traumatic stress above and beyond trauma exposure</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Data Analytic Strategy**

Given that the integration of the traumatic stress and organizational psychology literature is in its infancy, the state of the literature does little to inform precise hypotheses or data analytic approaches. Although a priori hypotheses have been specified, the status of the literature renders these hypotheses to be loose guidelines that span the realm of confirmatory and exploratory research. Accordingly, the hypotheses provide a basic template with which to approach the data analyses;
however, data analyses will proceed in a staged approach in which the results of each step will inform the subsequent analyses.

The staged approach to data analyses will be as follows. (1) The severity and distress associated with overall trauma exposure will be correlated to determine if a composite variable ought to be created. The correlation between the severity and distress associated with the index trauma will also be inspected for this purpose. (2) For exploratory purposes additional descriptive analyses will be presented. (3) Correlational analyses will be performed to ascertain whether greater traumatic stress and less posttraumatic growth are associated with less role clarity, utilization of skills, autonomy, perceived organizational support, team cohesion, and affective and normative commitment but greater high sacrifice and low alternative commitment. The relationship between workload and each of traumatic stress and posttraumatic growth will be inspected for the presence of curvilinear relationships. (4) The relative contribution of the organizational climate and organizational commitment above and beyond the characteristics of trauma exposure (i.e., severity and distress associated with overall and index trauma) will be determined. (5) The hypothesized moderating relationships will be tested. (6) The hypothesized mediating relationships will be tested. (7) Those variables that did not function as moderators will be tested as mediators.
Chapter III: Method

Participants

General Description

The present study included a convenience sample of 352 Canadian emergency service providers (264 firefighters, 50 paramedics, 7 police officers, and 29 victim service responders). Complete data was provided by 251 emergency service providers (198 firefighters, 35 paramedics, 6 police officers, and 12 victim service providers). Participants who completed the survey did not differ from those participants who did not complete the survey in terms of the order of the questionnaires, $t(350) = -0.65$, ns, severity of overall trauma exposure, $t(286) = -0.68$, ns, distress associated with overall trauma exposure, $t(286) = 2.42$, ns, the severity of their most recent traumatic event, $t(286) = 0.25$, ns, distress associated with their most recent traumatic event, $t(286) = 0.52$, ns, traumatic stress, $t(259) = 0.69$, ns, or posttraumatic growth, $t(262) = 0.55$, ns.

Exclusion Criteria

It had been proposed that participants who reported no exposure to potentially traumatic events or with less than six months of service as an emergency service provider would be excluded from the study. One participant indicated that his/her most recent critical incident was not at all traumatic; however, this participant reported moderate distress and posttraumatic growth associated with this event and endorsed experiencing other potentially traumatic events (e.g., having been the victim of violence on the job and the death of a child). Accordingly, this participant was not excluded from the study. Given that only two participants reported less than six months of service as an emergency service provider or less than six months of service with their organization and that each of these participants reported trauma exposure and traumatic stress symptoms, these participants were not excluded from the study.

Participant Characteristics

The participants were predominantly male (85%), with a college education (52%), employed in full time duties (98%), and working regular rather than modified duties (98%). Forty-one percent of participants identified themselves as a supervisor, whereas the remaining participants indicated that they did not have a supervisory role. Fifteen percent of the participants indicated that they had a managerial role. Most participants were between the ages of 41 and 50 (39%) with more than 20 years of service as an emergency service provider (36%).
Participants reported experiencing numerous potentially traumatic events throughout their jobs (see Figure 1). Most notably, 50% reported a coworker who died in the line of duty, 41% reported being the victim of violence on the job, 69% reported some other threat to their personal safety while on the job, 76% reported handling dismembered or disfigured bodies, 57% disclosed having been in contact with infectious body fluids, and 74% recalled attending a call that involved the death of a child. Participants rated the most distressing events as including the death of a child followed by a line of duty death, contact with infectious body fluids, dealing with dismembered/disfigured bodies, and injured/ill children (see Figure 2).

Participants reported relatively mild scores on the Impact of Events Scale - Revised ($M = 2.17$, $SD = 2.34$) and moderate scores on the Posttraumatic Growth Inventory ($M = 10.72$, $SD = 5.20$). Wilson and Keane (2004) noted that normative data on the IES-R has never been published. Furthermore, comparisons of descriptive values of the IES-R with other studies that have employed the IES-R among samples of emergency service providers are also problematic. Some studies employed the IES-R among samples of emergency service providers but did not report descriptive statistics for the IES-R (e.g., Dean, Gow, & Shakespeare-Finch, 2003; Robinson, Sigman, & Wilson, 1997). Other studies administered the IES rather than the more recent IES-R among samples of emergency service providers (e.g., Brough, 2004; Regehr, Hill, Goldberg, & Hughes, 2003; Regehr, Hill, Knott, & Sault, 2003). Byron and Peterson (2002) employed the IES-R among a sample of university students in order to assess the impact of large-scale traumatic events on individual and organizational outcomes. This study reported the following descriptive statistics for the IES-R: $M = 28.10$, $SD = 14.27$; however, these values are markedly higher than those reported in the present study. The discrepancy is the result of Byron and Peterson having summed the IES-R items to arrive at a total score, rather than summing the mean values of each IES-R subscale as had been recommended by the IES-R authors (Weiss & Marmar, 1997).
Figure 1. Potentially Traumatic Events Experienced by Emergency Service Providers
Figure 2. Perceived Distress Associated with Potentially Traumatic Events
Measures

The Impact of Events Scale – Revised (IES-R)

Description. The IES-R (Weiss & Marmor, 1997) is a 22-item questionnaire measuring trauma-related intrusion, avoidance, and hyperarousal. The IES-R will serve as a measure of traumatic stress. Sample statements are as follows: Intrusion subscale (e.g., "Any reminder brought back feelings about it"), Avoidance subscale (e.g., "I avoided letting myself get upset when I thought about it or was reminded of it"), and Hyperarousal subscale (e.g., "I was jumpy and easily startled"). The frequency of each symptom within the past seven days is rated on a five-point scale (0 = not at all, 4 = extremely). Participants were asked to complete the IES-R with respect to the most traumatic event that they experienced through their job as an emergency service provider.

Reliability and Validity. Data from the IES-R has demonstrated high internal consistency (alpha = 0.96; Creamer, Bell, & Failla, 2003). Weiss and Marmor (1997) reported that data from the IES-R had high internal consistency with alphas ranging from .87 to .92 for the Intrusion subscale, .84 to .86 for the Avoidance subscale, and .79 to .90 for the Hyperarousal subscale (Briere, 1997). Data from the present study also indicated that the IES-R subscales had good internal consistency (Avoidance subscale α = .89, Intrusions subscale α = .92, and Hyperarousal subscale α = .88). Test-retest reliability in two samples was found to be .57 and .94 for the Intrusion subscale, .51 and .89 for the Avoidance subscale, and .59 and .92 for the Hyperarousal subscale (Weiss & Marmor, 1997). The discrepancy between the reliability estimates was attributed to a shorter assessment interval and more recent traumatic events in the latter sample. The hyperarousal subscale has demonstrated good predictive validity with regard to trauma (Briere, 1997). The Intrusion and Avoidance subscales have detected change in respondents' clinical status and have detected differences in responses to traumatic events of varying severity (Horowitz et al., 1979; Weiss & Marmor, 1997). Furthermore, the correlation between the IES-R and the PTSD Checklist was found to be high (0.84) (Creamer et al., 2003). Evidence of content validity has included endorsements of up to 85% for the Intrusion and Avoidance subscales (Horowitz et al., 1979). Construct validity was assessed by Weiss and Marmor (1997) who found that 19 items correlated more highly with their assigned subscale compared to the other subscales. The remaining two items ("I had trouble staying asleep" and "I avoided letting myself get upset when I..."
thought about it or was reminded of it”) correlated equally when comparing their assigned subscale and another subscale.

**The Posttraumatic Growth Inventory (PTGI)**

*Description.* The PTGI (Tedeschi & Calhoun, 1996) is a 21-item questionnaire asking participants about changes occurring in their lives as a result of crisis or trauma. The PTGI is an instrument for assessing positive outcomes following traumatic events (i.e., posttraumatic growth). The PTGI is composed of five subscales including Relating to Others (e.g., “A sense of closeness with others”), New Possibilities (e.g., “I established a new path for my life”), Personal Strength (e.g., “Knowing I can handle difficulties”), Spiritual Change (e.g., “A better understanding of spiritual matters”), and Appreciation of Life (e.g., “An appreciation for the value of my own life”). Participants rate the degree to which each change occurred on a six-point scale (0 = I did not experience this change as a result of my crisis, 5 = I experienced this change to a very great degree as a result of my crisis).

*Reliability and Validity.* Tedeschi and Calhoun (1996) reported the following evidence of reliability and validity. The internal consistency of the PTGI was found to be high (α = .90). The PTGI subscales demonstrated moderate to high internal consistency: New Possibilities α = .84, Relating to Others α = .85, Personal Strength α = .72, Spiritual Change α = .85, and Appreciation of Life α = .67. Corrected item-total correlations were all in the moderate range (r = .35 to r = .63). The Pearson product-moment correlations among the subscales ranged from r = .27 to r = .52 and the correlations between the subscales and the PTGI total score ranged from r = .62 to r = .83. These findings indicate overlap but some separate contributions by the subscales. Test-retest reliability for the PTGI over a two month interval was acceptable at r = .71. The test-retest reliability for the subscales over the same interval ranged from r = .65 to r = .74, except for the Personal Strength subscale (r = .37) and the Appreciation of Life subscale (r = .47). These authors also provided evidence of convergent and discriminant validity, which included a non-significant correlation between the PTGI and social desirability as well as positive correlations between the PTGI and optimism, religiosity, and all the major dimensions of personality on the NEO Personality Inventory except neuroticism. In order to establish evidence of construct validity, the authors compared persons who had experienced only ordinary life events with those who had experienced severely traumatic events. Results indicated that women reported more posttraumatic growth than men and persons who experienced severe trauma reported more posttraumatic growth than those
who had not experienced traumatic events. Data from the present study indicated that
the PTGI subscales had good internal consistency (New Possibilities \( \alpha = .87 \), Relating to
Others \( \alpha = .88 \), Personal Strength \( \alpha = .76 \), Spiritual Change \( \alpha = .87 \), and Appreciation of
Life \( \alpha = .81 \)).

The Job Stress Questionnaire (JSQ)

*Description.* The JSQ (Hamel & Bracken, 1986) will be employed as a measure
of organizational stress. The JSQ is a 13-item perceptual measure of job-related stress.
The following JSQ subscales were employed in the present study: Work Overload (e.g.,
"How often does your job leave you with little or no time to get things done?")
Role Ambiguity (e.g., "How often are you clear on what your job responsibilities are?")
and Utilization of Skills (e.g., "How often can you use the skills from previous training?").
Responses are indicated on a seven-point scale (1 = *never*, 7 = *always*).

*Reliability and Validity.* Hamel and Bracken (1986) reported internal
consistencies for the total sample \((N = 603)\), blue collar sample \((N = 178)\), white collar
sample \((N = 268)\), and professional sample \((N = 157)\). The coefficient alphas for each
subscale were as follows: Work Overload \( \alpha = .83 \) to \( \alpha = .78 \), Utilization of Skills \( \alpha = .89 \)
to \( \alpha = .72 \), and Role Ambiguity \( \alpha = .32 \) to \( \alpha = .07 \). Similarly, data from the present study
indicated that the JSQ subscales had good internal consistency (Workload \( \alpha = .86 \), Role
Ambiguity \( \alpha = .70 \), Utilization of Skills \( \alpha = .65 \)). Factor analysis revealed that all items
loaded highly onto their proposed factors for the blue collar sample; however,
occupational group membership moderated the dimensionality of the JSQ (Hamel &
Bracken, 1986). The authors reported that the differential results seem to be related to
differences in psychosocial stressors experienced by the contrasted subgroups (Hamel
& Bracken, 1986). The JSQ along with one subscale from each of the following two
measures described below served as a measure of organizational stress.

*The Psychological Climate Questionnaire (PCQ)*

*Description, Reliability, and Validity.* The PCQ (Strutton et al., 1993) is a measure
of the psychological climate in organizations. The Autonomy subscale of the PCQ was
employed in this research. The Autonomy subscale measures workers' perceptions of
their own sovereignty with respect to work procedures, goals, and priorities (Strutton et
al., 1993). The Autonomy subscale consists of five items (e.g., "I determine my own work
procedure"). Responses are indicated on a seven-point scale (1 = *strongly disagree*, 7 =
*strongly agree*). The Autonomy subscale demonstrated good internal consistency (\( \alpha = .80 \); Strutton et al., 1993). Data from the present study also indicated that the Autonomy
subscale had good internal consistency, $\alpha = .84$. Confirmatory factor analysis
demonstrated that all items loaded significantly onto their respective factors and factor
loadings for the Autonomy subscale ranged from .81 to .82 (Strutton et al., 1993).
Strutton et al. (1993) found that those employees who had greater trust in their
managers perceived their organization's psychological climate to be higher in autonomy
than did the employees who classified as low in trust.

The Affective, Continuance, and Normative Commitment Scales – Revised

Description. This measure consists of three independent scales, each measuring
one type of organizational commitment: Affective Commitment, Continuance
Commitment, and Normative Commitment (Allen & Meyer, 1990; Meyer & Allen, 1991;
Meyer et al., 1993). Sample statements are as follows: Affective Commitment (e.g., “This
organization has a great deal of personal meaning for me”), Continuance Commitment
(e.g., “I feel that I have too few options to consider leaving this organization”), and
Normative Commitment (e.g., “I would not leave my organization right now because I
have a sense of obligation to the people in it”). More recently, it has been found that the
Continuance Commitment subscale is better represented by two, distinct dimensions:
High-Sacrifice Commitment, which refers to the perceived sacrifice associated with
leaving (e.g., “Too much of my life would be disrupted if I decided I wanted to leave my
organization now”), and Low-Alternative Commitment, which refers to costs resulting
from a lack of employment alternatives (e.g., “Right now, staying with my organization is
a matter of necessity as much as desire”; Bentein et al., 2005; Dunham et al., 1994;
Hackett et al., 1994; McGee & Ford, 1987; Meyer et al., 1990). Responses are indicated
on a seven-point scale ($1 = \text{strongly disagree}, 7 = \text{strongly agree}$) and are averaged to
yield composite commitment scores. The data obtained from the proposed research will
be analyzed in accordance with the four-factor model.

Reliability and Validity. As reported by Meyer and Allen (1997), the number of
estimates of internal consistency within the existing literature has ranged from a low of
20 estimates for the Normative Commitment scale to a high of more than 40 estimates
for the Affective Commitment scale. The median of these estimates are as follows:
Affective Commitment $\alpha = .85$, Continuance Commitment $\alpha = .79$, and Normative
Commitment $\alpha = .73$. McGee and Ford (1987) calculated the internal consistency for the
original Continuance Commitment scale ($\alpha = .70$) as well as the High-Sacrifice
Commitment scale ($\alpha = .71$) and the Low-Alternative Commitment scale ($\alpha = .72$).
Across three different samples, similar results were found (Low-Alternative Commitment,
\[ \alpha = .58 \text{ to } .78; \] High-Sacrifice Commitment, \( \alpha = .54-.75; \) Dunham et al., 1994). Similarly, results from the present study indicated that the various subscales have good internal consistency (Affective Commitment \( \alpha = .87, \) Normative Commitment \( \alpha = .88, \) Low Alternative Commitment \( \alpha = .82, \) High Sacrifice Commitment \( \alpha = .89). \)

Those studies that have reported test-retest reliability typically found lower values when commitment was measured early in employees’ careers. When commitment was measured on the first day of work and then 6 months later, test-retest reliability was found to be as low as .38 for the Affective Commitment scale and .44 for the Continuance Commitment scale. Test-retest reliability estimates were above .60 when the measures were obtained after at least one month of employment (Meyer, Bobocel, & Allen, 1991; Meyer et al., 1993). When the scales were administered to employees with an average tenure of more than five years, test-retest reliability following a seven week interval was found to be .94 for the Affective Commitment scale (Blau, Paul, & St. John, 1993).

The results of both exploratory and confirmatory factor analyses provide evidence suggesting that affective, continuance, and normative commitment are distinguishable constructs (Allen & Meyer, 1990; Dunham et al., 1994; Hackett et al., 1994; McGee & Ford, 1987; Meyer et al., 1990; Moorman, Niehoff, & Organ, 1993; Reilly & Orsak, 1991; Shore & Tettick, 1991; Somers, 1993; Vandenberghe, 1996). In a meta-analysis conducted by Meyer et al. (2002), it was found that the correlations between affective commitment and low-alternative (\( \rho = -.24 \)) and high-sacrifice commitment (\( \rho = -.06 \)) as well as the correlations between normative commitment and low-alternatives (\( \rho = -.02 \)) and high-sacrifice commitment (\( \rho = -.16 \)) were small and negative. High-sacrifice commitment and low-alternative commitment were highly correlated (\( \rho = .86; \) Meyer et al., 2002). The existing literature has demonstrated that affective, continuance, and normative commitment are distinguishable from related constructs such as job satisfaction (Shore & Tettick, 1991), career, job, and work values (Blau et al., 1993), career commitment (Reilly & Orsak, 1991), occupational commitment (Meyer et al., 1993), and perceived organizational support (Shore & Tettick, 1991). Further evidence of the construct validity of the measures is available in a plethora of publications (e.g., Allen & Meyer, 1990; Bentein et al., 2005; Bycio, Hackett, & Allen, 1995; Dunham et al., 1994; Hackett et al., 1994; Konovsky & Cropanzano, 1991; McGee & Ford, 1987; Meyer et al., 2002; Meyer et al., 1990; Shore & Wayne, 1993; Whitener & Walz, 1993).
The Survey of Perceived Organizational Support (SPOS)

Description. The SPOS (Eisenberger et al., 1986) measures global beliefs that employees form concerning the extent to which their organization values their contributions and cares about their well-being. The SPOS is a unidimensional measure (Eisenberger, et al., 1986; Hutchison, 1997; Shore & Tettick, 1991). The SPOS measures evaluative judgements attributed to the organization, including satisfaction with the employee as a member of the organization, satisfaction with the employee’s performance, anticipation of the employee’s future value, appreciation of the employee’s extra effort, consideration of the employee’s goals and opinions, the organization’s concerns about fair pay, job enrichment, full use of the employee’s talents, the employee’s satisfaction on the job, and the employee’s well-being. The SPOS also measures actions affecting the employee that the organizations would be likely to take in hypothetical situations, such as willingness to help with job problems, replacing the employee with a lower paid new employee, responses to the employee’s possible complaints, mistakes, worsened performance, improved performance, requested change of working conditions, requested special favour, decision to quit, failure to complete a task on time, retention of the employee following job obsolescence, rehiring after layoff, and opportunities for promotion.

Versions of the SPOS. Two versions of the SPOS are available: a 36-item version and a 17-item short version. The short version is comprised of the 17 items with the highest factor loadings (e.g., “The organization values my contribution to its well-being” and “The organization strongly considers my goals and values”). Both versions of the SPOS require participants to indicate the extent of their agreement with each item on a 7-point scale (1 = strongly disagree, 7 = strongly agree). The SPOS short-version will be employed in the current research. Rhoades and Eisenberger (2002, p. 699) stated that “because the original scale is unidimensional and has high internal reliability, the use of shorter versions does not appear problematic. Prudence nevertheless dictates that both facets of the definition of POS [perceived organizational support] (valuation of employees’ contribution and care about employees’ well-being) be represented in short versions of the questionnaire.”

Reliability and Validity. It has been shown that the SPOS has high internal consistency (α = .97), with item-total correlations ranging from .42 to .83, a mean item-total correlation of .67, and a median item-total correlation of .66. Internal consistency of the SPOS short-version has also been found to be high (α = .93; Eisenberger et al.,
Similarly, the internal consistency of the SPOS was also found to be high ($\alpha = .93$) in the present study. Shore and Tetrick (1991) examined the construct validity of the SPOS. The results support the SPOS as a unidimensional scale that is distinguishable from affective and continuance commitment. However, the data raised some question as to the empirical distinction between the SPOS and satisfaction. Nye and Witt (1993) provided evidence of the construct validity of the SPOS by comparing it with the Perceptions of Politics Scale (POPS), which was designed to assess the degree to which respondents view their work environments as political. A negative relationship between the SPOS and POPS was expected and found. The SPOS and POPS were strongly and inversely related (-.85). Furthermore, each of these scales produced significant but oppositely signed correlations with other job related measures such as job satisfaction (SPOS = .68, POPS = -.62) and commitment (SPOS = .59, POPS = -.58). Hutchison (1997) used confirmatory factor analysis to further examine the construct validity of the scores on the SPOS. The SPOS was found to be distinguishable from two similarly conceptualized correlates of affective commitment: perceived supervisory support and organizational dependability. Bishop, Scott, Goldsby, and Cropanzano (2005) provided further evidence of the construct validity of the SPOS. These authors found that participants distinguished among organizational commitment, team commitment, organizational support, and team support. In terms of predictive validity, the SPOS has been found to predict commitment to that same organization (Bishop et al., 2005) and reductions in absenteeism (Eisenberger et al., 1986).

The Organizational Citizenship Behaviour Scale (OCBS)

Description. The OCBS (Podsakoff et al., 1990) is a 24-item questionnaire that measures organizational citizenship behaviour. Responses are rated on a seven-point scale (1 = strongly disagree, 7 = strongly agree). The OCBS consists of five subscales, which correspond to the five types of organizational citizenship behaviour identified by Organ (1988): Altruism, Conscientiousness, Sportsmanship, Courtesy, and Civic Virtue. Courtesy refers to discretionary behaviour on the part of an individual aimed at preventing work-related problems with others from occurring (e.g., "Takes steps to try to prevent problems with other workers"). The Courtesy subscale was included in the present study, as a measure of team cohesion, in combination with the Team Cohesion subscale of the Revised Substitutes for Leadership Scale (discussed below).
Consistent with Tepper, Duffy, Hoobler, and Ensley (2004), this instrument was used to measure the extent to which participants' coworkers perform organizational citizenship behaviours. In this way, the Courtesy subscale of the OCBS served as a measure of participants' perceived "climate" of courtesy (Tepper et al., 2004, p. 463). It was found that measuring organizational citizenship behaviour in this manner did not differ significantly from the mean of participants' ratings of each of their coworkers (Tepper et al., 2004). The items were prefaced with "my coworkers" and participants will be instructed to interpret "my coworkers" as "those coworkers whom [they] most frequently encounter."

Reliability and Validity. Internal consistency for the Courtesy subscale was good, $\alpha = .85$ (Podsakoff et al., 1990). Similarly, the Courtesy subscale demonstrated good internal consistency in the present study, $\alpha = .94$. Confirmatory factor analysis demonstrated that the overall fit of the five-factor model was good (TLI = .94) with all of the items loading significantly on their intended factors (Podsakoff et al., 1990). Furthermore, the confirmatory factor analysis indicated good correspondence with Organ's (1988) theoretical framework. Factor intercorrelations were low to moderate, providing evidence of the discriminant validity of the factors (Podsakoff et al., 1990). However, the Courtesy and Altruism subscales were highly correlated ($r = .86$) as were the Altruism and Conscientiousness subscales ($r = .81$). Podsakoff et al. (1990) explained that these high correlations were expected because Organ's (1988) distinction between these types of organizational citizenship behaviour was subtle. Further evidence for the construct validity of the OCBS was obtained from low to moderate correlations with constructs such as core transformational leader behaviours, high performance expectations, individualized support, intellectual stimulation, contingent reward behaviour, trust, and satisfaction (Podsakoff et al., 1990).

Revised Substitutes for Leadership Scale (RSLS)

Description. The RSLS was designed to measure a variety of situational variables that can substitute for, neutralize, or enhance the effects of leadership behaviour (Podsakoff et al., 1993). This measure consists of 13 subscales and responses are indicated on a seven-point scale (1 = strongly disagree, 7 = strongly agree). The subscale titled, Closely Knit, Cohesive, Interdependent Work Groups, will be employed as a measure of team cohesion in the proposed research. Hereafter this subscale will be referred to as the Team Cohesion subscale. The Team Cohesion subscale consists of six items (e.g., "There is a great deal of trust among members of
my work group” and “Members of my work group work together as a team”). For the purpose of the proposed research, the phrase “members of my work group,” will be replaced with the phrase, “my coworkers.” This alteration will ensure that all items are relevant to emergency service providers, who are not assigned to work groups (e.g., paramedics are usually paired with one co-worker). Participants will be instructed to interpret “my coworkers” as “those coworkers whom [they] most frequently encounter.”

Reliability and Validity. The RSLS items demonstrated good correspondence between the a priori specification of the items and their factor loadings. The internal consistency reliabilities of the 13 subscales averaged .84 and all but one of the subscales (Need for Independence) exceeded .70. The intercorrelations of the 13 subscales revealed a pattern very similar to the pattern reported in previous research (Podsakoff et al., 1993). Item-total correlations for the Team Cohesion subscale ranged from .73 to .85. The six items composing the Team Cohesion subscale loaded well onto the Team Cohesion factor with factor loadings ranging from .72 to .83. The Tucker-Lewis coefficient for the Team Cohesion subscale was .98. This suggests that this factor represents a unidimensional construct. The Cronbach α-coefficient for the Team Cohesion subscale was .93, indicating good internal consistency. The Drasgow-Miller coefficient for the Team Cohesion subscale was .95, which is a scale score to factor correlation. The Team Cohesion subscale demonstrated low to moderate correlations with other subscales and with various leadership behaviours.

The present study included the Courtesy subscale of the OCBS and the Team Cohesion subscale of the RSLS as a measure of team cohesion. As mentioned above, the Courtesy subscale of the OCBS demonstrated good internal consistency (α = .94). Similarly, the Team Cohesion subscale of the RSLS also demonstrated good internal consistency (α = .94). When these scales were combined to form a measure of team cohesion for the purpose of the present study, good internal consistency was once again found (α = .96).

Trauma Exposure and Distress Ratings

In order to obtain an estimate of the participants’ perceived trauma exposure, questions were posed about the most recent traumatic event that the participants experienced (i.e., index trauma) as well as the overall trauma that they experienced through their jobs (i.e., overall trauma). Participants were asked to appraise the severity of their overall trauma exposure (0 = not at all traumatic, 100 = very traumatic) as well as the severity of their index trauma (0 = not at all traumatic, 100 = very traumatic). From
this point forward these variables are respectively referred to as the severity of overall trauma exposure and the severity of the index trauma.

Given the potential discrepancy between those events that are considered traumatic by lay persons relative to the events that are considered to be the most upsetting by emergency service providers (e.g., the despair of a suicide victim, Regehr & Bober, 2005), participants were asked to appraise how distressing their overall trauma exposure had been (0 = not at all distressing, 100 = very distressing) and also to appraise how distressing their index trauma had been (0 = not at all distressing, 100 = very distressing). These variables are herein referred to as the distress associated with overall and index trauma exposure.

The aforementioned ratings were provided on a visual analogue scale that consisted of a horizontal bar that could be manipulated by participants; however, numerical values that corresponded to participants' responses were not visible to the participants. Those participants that completed a hard copy of the survey indicated their response by drawing an “x” on a horizontal line.

Participants were also asked to qualitatively describe their index trauma and report the duration since that traumatic event. They were also asked to report whether they had experienced various potentially traumatic events and to indicate the degree of distress associated with those events. All unpublished questionnaires developed for use in the present study are provided in Appendix B.

Open-Ended Questions

In addition to the aforementioned measures, the participants were provided with an opportunity to elaborate the following in open-ended format: description of the index trauma, their perceptions about what is most stressful about their jobs, and any other comments or concerns. Participants typed their responses into the space provided. These questions are provided in Appendix B.

Procedures

Recruitment of Emergency Service Organizations

Five emergency service organizations agreed to participate in the study: one urban emergency medical service organization in southwestern Ontario, three urban fire service organizations in southern Ontario, and one victim service agency in southwestern Ontario. Approval was also obtained from the unions associated with each of these organizations. In addition, the study was advertised on a national firefighter website dedicated to line of duty deaths and line safety initiatives.
Participant Recruitment

Emergency service organizations informed their employees of the study via email or letters. Through these channels, prospective participants were informed of the purpose of the study, the anonymous and confidential nature of the survey, organization and union support for the study, and the survey website. Advertisements for the survey were placed in various locations around the participating organizations. A hyperlink to the survey was also made available on the national firefighter website. Internet access was unavailable in one fire service organization and as such, surveys were administered in hard copy format to that organization.

Internet Survey Procedures

When prospective participants entered the survey website, an information sheet was displayed that included a description of the study (presented in Appendix A), anticipated benefits and risks, information about anonymity and confidentiality, estimated time required to complete the survey, and contact information for any questions or comments. Prospective participants were informed that they would not be offered remuneration for their participation but that aggregate results would be presented to their organizations and unions. Prospective participants selected the corresponding radial button to indicate their decision to participate in the study or decline participation.

A login screen was initially displayed to the participants, where they were instructed to create a unique password using the algorithm provided. The algorithm ensured participants' anonymity while permitting them to resume uncompleted surveys at a later time. After participants created their password, the survey was displayed. At any point during the survey, participants could select a button to save their data and resume the survey at a later time. Upon completion of the survey, participants selected a button to submit their data and a debriefing form was displayed. All data was automatically saved into a Microsoft Excel worksheet, which was translated into an SPSS data set after all data had been collected. Hard copies of the survey were also made available upon request, in which case the data was submitted in an anonymous envelope and the results were added to the SPSS data set manually.
Chapter IV: Results

Data Screening

The data were screened for missing values, outliers, and violations of statistical assumptions. Visual inspection, frequency information, and histograms revealed data that appeared to be missing at random, which constituted less than ten percent of the data. Accordingly, the missing data was substituted via imputation of variable means at the item-level (Tabachnick & Fidell, 2001). Linear interpolation was used to replace missing data for the variable duration since the index trauma, because more than ten percent of the data was missing. Normality was investigated using histograms, frequency statistics, and skewness and kurtosis values. A logarithmic transformation was applied to the variable duration since the index trauma, because it was severely positively skewed (Tabachnick & Fidell, 2001). Stem-and-leaf plots and histograms did not identify severe, univariate outliers. Mahalanobis distance revealed a multivariate outlier, which was excluded from the analyses. Cook’s distance and standardized Dffit values were calculated for each independent and dependent variable combination, which did not reveal influential cases (i.e., Cook’s distance values > 1 and Dffit values > ± 2). Linearity and homoscedasticity was investigated using residual and bivariate scatterplots. Condition indexes, tolerances, and intercorrelations were inspected for multicollinearity and singularity (Belsley, Kuh, & Welsch, 1980). The Durbin-Watson statistic indicated that the data met the assumption of the independence of errors. Inspection of scatterplots did not reveal any curvilinear relationships.

Descriptive and Exploratory Analyses

Descriptive statistics are reported for the severity and distress associated with overall trauma exposure as well as the severity and distress associated with the index trauma (see Table 1). Descriptive statistics for traumatic stress symptoms (i.e., IES-R scores), posttraumatic growth (i.e., PTGI scores), the organizational climate variables, and organizational commitment variables are also included in Table 2. Intercorrelations among all measured variables are presented in Appendix D.

In order to ascertain whether composite variables should be created, the correlation between the severity and distress associated with overall trauma exposure as well as the correlation between the severity and distress associated with the index trauma were inspected. The correlations did not exceed $r = .80$ (see Table 3; Tabachnick & Fidell, 2001), suggesting that these variables were not redundant. Accordingly, composite variables were not created.
Table 2
Descriptive Statistics for the Variables Employed in the Present Study (N = 250)

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>s²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall trauma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity</td>
<td>60.36</td>
<td>24.76</td>
<td>613.20</td>
</tr>
<tr>
<td>Distress</td>
<td>57.52</td>
<td>24.33</td>
<td>592.05</td>
</tr>
<tr>
<td>Index trauma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity</td>
<td>80.01</td>
<td>22.35</td>
<td>499.54</td>
</tr>
<tr>
<td>Distress</td>
<td>75.11</td>
<td>23.54</td>
<td>554.22</td>
</tr>
<tr>
<td>IES-R</td>
<td>2.17</td>
<td>2.34</td>
<td>5.49</td>
</tr>
<tr>
<td>PTGI</td>
<td>10.72</td>
<td>5.20</td>
<td>27.00</td>
</tr>
<tr>
<td>Organizational stress</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomy</td>
<td>17.81</td>
<td>3.19</td>
<td>10.18</td>
</tr>
<tr>
<td>Role clarity</td>
<td>19.35</td>
<td>7.36</td>
<td>54.13</td>
</tr>
<tr>
<td>Utilization of skills</td>
<td>9.82</td>
<td>2.54</td>
<td>6.44</td>
</tr>
<tr>
<td>Workload</td>
<td>14.21</td>
<td>3.51</td>
<td>12.29</td>
</tr>
<tr>
<td>Perceived organizational support</td>
<td>21.27</td>
<td>4.89</td>
<td>23.92</td>
</tr>
<tr>
<td>Team cohesion</td>
<td>61.07</td>
<td>20.06</td>
<td>402.43</td>
</tr>
<tr>
<td>Team cohesion</td>
<td>10.76</td>
<td>2.67</td>
<td>7.14</td>
</tr>
<tr>
<td>Courtesy</td>
<td>35.01</td>
<td>7.48</td>
<td>56.02</td>
</tr>
<tr>
<td>Organizational commitment</td>
<td>24.64</td>
<td>7.93</td>
<td>62.95</td>
</tr>
<tr>
<td>Affective</td>
<td>17.35</td>
<td>3.71</td>
<td>13.77</td>
</tr>
<tr>
<td>Normative</td>
<td>26.94</td>
<td>8.84</td>
<td>74.14</td>
</tr>
<tr>
<td>High sacrifice</td>
<td>9.35</td>
<td>9.49</td>
<td>90.09</td>
</tr>
<tr>
<td>Low alternative</td>
<td>29.86</td>
<td>9.05</td>
<td>81.85</td>
</tr>
<tr>
<td></td>
<td>12.89</td>
<td>5.20</td>
<td>27.02</td>
</tr>
</tbody>
</table>

Note. IES-R = Impact of Events Scale – Revised, PTGI = Posttraumatic Growth Inventory

Table 3
Correlations between the Severity and Distress Associated with Overall Trauma and the Index Trauma (N = 250)

<table>
<thead>
<tr>
<th>Overall trauma</th>
<th>Index trauma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity</td>
<td>Distress</td>
</tr>
<tr>
<td>Severity</td>
<td>—</td>
</tr>
<tr>
<td>Distress</td>
<td>—</td>
</tr>
</tbody>
</table>

For exploratory purposes, correlational analyses were performed to inspect the relationship between trauma exposure, distress, traumatic stress, and posttraumatic growth. Table 4 presents the correlations between IES-R scores and severity and
distress associated with overall and index trauma. The correlations between PTGI scores and the severity and distress associated with overall and index trauma are also reported in this table. The findings indicate that more severe trauma exposure (overall trauma and index trauma) was correlated with greater traumatic stress symptoms and greater posttraumatic growth. Similarly, greater distress (associated with overall trauma and the index trauma) was correlated with greater traumatic stress symptoms and posttraumatic growth.

Table 4
Correlations between Trauma Exposure and Posttraumatic Sequelae (N = 250)

<table>
<thead>
<tr>
<th></th>
<th>IES-R</th>
<th>PTGI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall trauma exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived severity</td>
<td>.32**</td>
<td>.24**</td>
</tr>
<tr>
<td>Perceived distress</td>
<td>.40**</td>
<td>.21**</td>
</tr>
<tr>
<td>Index trauma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived severity</td>
<td>.36**</td>
<td>.24**</td>
</tr>
<tr>
<td>Perceived distress</td>
<td>.40**</td>
<td>.19**</td>
</tr>
</tbody>
</table>

**p < .01.

In order to achieve a more detailed understanding of the relationship between trauma exposure and trauma sequelae, these correlations were repeated with the IES-R subscales and PTGI subscales. Table 5 indicates that more severe trauma exposure and greater distress (associated with overall trauma exposure and the index trauma) were correlated with greater avoidance, intrusive, and hyperarousal symptoms. In terms of posttraumatic growth, Table 6 reveals that greater overall trauma exposure (severity and distress) was correlated with greater sense of relating to others, spiritual change, appreciation of life, new possibilities in life, and personal strength. More severe index trauma (severity and distress) was associated with a greater sense of relating to others, appreciation of life, and personal strength. The perceived severity of the index trauma (not the associated distress) was positively correlated with new possibilities in life. The index trauma (severity and distress) was not significantly correlated with spiritual change. In summation, trauma exposure was correlated with greater traumatic stress symptoms (avoidance, intrusions, and hyperarousal) but only certain posttraumatic growth subscales.
Table 5
Correlations between Trauma Exposure and the IES-R Subscales (N = 250)

<table>
<thead>
<tr>
<th>IES-R Subscales</th>
<th>Avoidance</th>
<th>Intrusions</th>
<th>Hyperarousal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall trauma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity</td>
<td>.29**</td>
<td>.35**</td>
<td>.26**</td>
</tr>
<tr>
<td>Distress</td>
<td>.34**</td>
<td>.42**</td>
<td>.34**</td>
</tr>
<tr>
<td>Index trauma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity</td>
<td>.33**</td>
<td>.36**</td>
<td>.31**</td>
</tr>
<tr>
<td>Distress</td>
<td>.38**</td>
<td>.40**</td>
<td>.35**</td>
</tr>
</tbody>
</table>

**p < .01.

Table 6
Correlations between Trauma Exposure and the PTGI Subscales (N = 250)

<table>
<thead>
<tr>
<th>PTGI Subscales</th>
<th>Relating to others</th>
<th>Spiritual change</th>
<th>Appreciation of life</th>
<th>New possibilities</th>
<th>Personal strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall trauma</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity</td>
<td>.23**</td>
<td>.23**</td>
<td>.18**</td>
<td>.17**</td>
<td>.18**</td>
</tr>
<tr>
<td>Distress</td>
<td>.22**</td>
<td>.18**</td>
<td>.17**</td>
<td>.15*</td>
<td>.15*</td>
</tr>
<tr>
<td>Index trauma</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity</td>
<td>.21**</td>
<td>.10</td>
<td>.28**</td>
<td>.16*</td>
<td>.28**</td>
</tr>
<tr>
<td>Distress</td>
<td>.14*</td>
<td>.11</td>
<td>.23**</td>
<td>.11</td>
<td>.21**</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01.

Descriptive statistics for IES-R and PTGI scores across levels of the demographic variables are presented in Table 7. One-way multivariate analysis of variance (MANOVA) indicated that the combination of dependent variables did not differ significantly based on gender (Λ = .98, ns), education (Λ = .98, ns), employment status (Λ = .99, ns), supervisory status (Λ = .99, ns), managerial status (Lambda = .98, ns), status of duties (Λ = .97, ns), duration of employment as an emergency service provider (Λ = .97, ns), duration of employment with their current organization (Λ = .95, ns), or age (Λ = .96, ns). Correlations between the descriptive variables and IES-R and PTGI scores are presented in Appendix E.
Table 7
Descriptive Statistics for IES-R and PTGI across the Demographic Variables

<table>
<thead>
<tr>
<th></th>
<th>IES-R</th>
<th></th>
<th>PTGI</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>206</td>
<td>2.15</td>
<td>2.29</td>
<td>10.65</td>
</tr>
<tr>
<td>Female</td>
<td>37</td>
<td>2.43</td>
<td>2.76</td>
<td>11.48</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>48</td>
<td>2.01</td>
<td>2.19</td>
<td>10.39</td>
</tr>
<tr>
<td>College</td>
<td>125</td>
<td>2.19</td>
<td>2.34</td>
<td>10.60</td>
</tr>
<tr>
<td>University and Postgraduate</td>
<td>69</td>
<td>2.35</td>
<td>2.55</td>
<td>11.30</td>
</tr>
<tr>
<td>Employment status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full time</td>
<td>238</td>
<td>2.19</td>
<td>2.35</td>
<td>10.81</td>
</tr>
<tr>
<td>Part time or retired</td>
<td>5</td>
<td>2.41</td>
<td>3.39</td>
<td>9.32</td>
</tr>
<tr>
<td>Supervisor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>97</td>
<td>2.12</td>
<td>2.14</td>
<td>11.06</td>
</tr>
<tr>
<td>No</td>
<td>140</td>
<td>2.21</td>
<td>2.53</td>
<td>10.66</td>
</tr>
<tr>
<td>Manager</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>35</td>
<td>2.31</td>
<td>2.15</td>
<td>12.23</td>
</tr>
<tr>
<td>No</td>
<td>200</td>
<td>2.22</td>
<td>2.43</td>
<td>10.53</td>
</tr>
<tr>
<td>Status of duties</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular duties</td>
<td>239</td>
<td>2.14</td>
<td>2.32</td>
<td>10.78</td>
</tr>
<tr>
<td>Light duties or disability</td>
<td>4</td>
<td>5.07</td>
<td>3.46</td>
<td>10.59</td>
</tr>
<tr>
<td>Years of service</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 5 years</td>
<td>32</td>
<td>2.02</td>
<td>2.24</td>
<td>10.62</td>
</tr>
<tr>
<td>5 to 10 years</td>
<td>26</td>
<td>2.32</td>
<td>2.59</td>
<td>11.04</td>
</tr>
<tr>
<td>10 to 15 years</td>
<td>38</td>
<td>2.15</td>
<td>2.47</td>
<td>10.14</td>
</tr>
<tr>
<td>15 to 20 years</td>
<td>43</td>
<td>2.37</td>
<td>2.76</td>
<td>10.82</td>
</tr>
<tr>
<td>More than 20 years</td>
<td>94</td>
<td>2.28</td>
<td>2.22</td>
<td>10.94</td>
</tr>
<tr>
<td>Years with current organization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 5 years</td>
<td>42</td>
<td>1.68</td>
<td>2.09</td>
<td>10.82</td>
</tr>
<tr>
<td>5 to 10 years</td>
<td>35</td>
<td>2.33</td>
<td>2.65</td>
<td>10.88</td>
</tr>
<tr>
<td>10 to 15 years</td>
<td>38</td>
<td>1.86</td>
<td>2.23</td>
<td>10.80</td>
</tr>
<tr>
<td>15 to 20 years</td>
<td>38</td>
<td>2.62</td>
<td>2.83</td>
<td>10.79</td>
</tr>
<tr>
<td>More than 20 years</td>
<td>88</td>
<td>2.36</td>
<td>2.22</td>
<td>10.68</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 years old and younger</td>
<td>28</td>
<td>1.63</td>
<td>2.16</td>
<td>9.91</td>
</tr>
<tr>
<td>31-40 years old</td>
<td>65</td>
<td>2.44</td>
<td>2.75</td>
<td>11.06</td>
</tr>
<tr>
<td>41-50 years old</td>
<td>95</td>
<td>2.05</td>
<td>2.20</td>
<td>10.81</td>
</tr>
<tr>
<td>51 years old and up</td>
<td>54</td>
<td>2.46</td>
<td>2.24</td>
<td>10.96</td>
</tr>
</tbody>
</table>
Correlational Analyses

Hypotheses 1(a) through 8(a) predicted that less traumatic stress symptoms but greater posttraumatic growth would be correlated with less organizational stress and greater organizational support, team cohesion, and organizational commitment. In order to evaluate hypotheses 1(a) through 8(a), Pearson's product-moment correlation was employed to calculate correlations between the organizational variables and each of traumatic stress and posttraumatic growth. The results are summarized in Table 8 and are discussed below the table.

Table 8
Correlations between the Organizational Climate, Organizational Commitment, and Posttraumatic Sequelae (N = 250)

<table>
<thead>
<tr>
<th></th>
<th>IES-R</th>
<th>PTGI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational stress</td>
<td>.07</td>
<td>.11</td>
</tr>
<tr>
<td>Autonomy</td>
<td>-.04</td>
<td>.12</td>
</tr>
<tr>
<td>Role clarity</td>
<td>-.00</td>
<td>.00</td>
</tr>
<tr>
<td>Utilization of skills</td>
<td>.01</td>
<td>.10</td>
</tr>
<tr>
<td>Workload</td>
<td>.29**</td>
<td>.08</td>
</tr>
<tr>
<td>Perceived organizational support</td>
<td>-.18**</td>
<td>.08</td>
</tr>
<tr>
<td>Team cohesion</td>
<td>-.25**</td>
<td>.01</td>
</tr>
<tr>
<td>Team cohesion</td>
<td>-.25**</td>
<td>.02</td>
</tr>
<tr>
<td>Courtesy</td>
<td>-.23**</td>
<td>-.00</td>
</tr>
<tr>
<td>Organizational commitment</td>
<td>-.11</td>
<td>.05</td>
</tr>
<tr>
<td>Affective commitment</td>
<td>-.27**</td>
<td>.03</td>
</tr>
<tr>
<td>Normative commitment</td>
<td>-.15*</td>
<td>.12</td>
</tr>
<tr>
<td>High sacrifice commitment</td>
<td>.02</td>
<td>-.03</td>
</tr>
<tr>
<td>Low alternative commitment</td>
<td>.11</td>
<td>.00</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01.

The results presented in Table 8 partially supported the hypotheses 5(a) through 7(a) such that greater traumatic stress symptoms were correlated with less organizational support, team cohesion, affective commitment, and normative commitment. Contrary to hypothesis 4(a), inspection of scatterplots indicated that workload did not have a curvilinear relationship with either traumatic stress or posttraumatic growth. Instead, greater workload was associated with greater traumatic stress but was not significantly related to posttraumatic growth. The remaining correlations were not significant, contrary to hypotheses 1(a) to 4(a) and hypothesis 8(a).
Hypotheses 9 and 10 proposed that absenteeism would be related to the organizational climate, organizational commitment, and trauma sequelae (i.e., traumatic stress and posttraumatic growth). In order to evaluate these hypotheses, multiple dimensions of absenteeism (i.e., total absenteeism, vacation, sick time, workplace injury, mental health, and other) were correlated with the various organizational climate variables, organizational commitment, traumatic stress symptoms, and posttraumatic growth. In support of hypothesis 10, greater traumatic stress was correlated with greater absenteeism, as categorized by sick days, workplace injury, and mental health. However, posttraumatic growth was not correlated with absenteeism. In terms of the relationship between absenteeism and the organizational climate, less absenteeism was correlated with less organizational stress and greater organizational support and team cohesion. Less absenteeism was correlated with greater affective and normative commitment but less low alternative commitment. These findings provided support for hypothesis 9; however, high sacrifice was not significantly correlated with any dimension of absenteeism. Detailed findings are reported in Table 9.

Table 9
Correlations between Absenteeism, the Organizational Climate, Organizational Commitment, and Posttraumatic Sequelae (N = 250)

<table>
<thead>
<tr>
<th>Absenteeism</th>
<th>Total</th>
<th>Vacation</th>
<th>Sick days</th>
<th>Work injury</th>
<th>Mental health</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>IES-R</td>
<td>.08</td>
<td>.01</td>
<td>.20**</td>
<td>.17*</td>
<td>.23**</td>
<td>-.07</td>
</tr>
<tr>
<td>PTGI</td>
<td>.02</td>
<td>-.08</td>
<td>.10</td>
<td>-.03</td>
<td>.13*</td>
<td>.01</td>
</tr>
<tr>
<td>Organizational stress</td>
<td>-.03</td>
<td>-.02</td>
<td>.13*</td>
<td>.03</td>
<td>.08</td>
<td>.11</td>
</tr>
<tr>
<td>Autonomy</td>
<td>.02</td>
<td>.03</td>
<td>.06</td>
<td>-.10</td>
<td>.11</td>
<td>.11</td>
</tr>
<tr>
<td>Role clarity</td>
<td>-.15*</td>
<td>-.11</td>
<td>.04</td>
<td>.02</td>
<td>-.08</td>
<td>.05</td>
</tr>
<tr>
<td>Utilization of skills</td>
<td>-.05</td>
<td>-.07</td>
<td>.09</td>
<td>.05</td>
<td>.08</td>
<td>.05</td>
</tr>
<tr>
<td>Workload</td>
<td>.13</td>
<td>.11</td>
<td>.18**</td>
<td>.15*</td>
<td>.11</td>
<td>.06</td>
</tr>
<tr>
<td>Organizational support</td>
<td>-.23**</td>
<td>-.02</td>
<td>-.21**</td>
<td>-.15*</td>
<td>-.18**</td>
<td>.01</td>
</tr>
<tr>
<td>Team cohesion</td>
<td>-.18**</td>
<td>-.12</td>
<td>-.18**</td>
<td>-.16*</td>
<td>-.24**</td>
<td>.02</td>
</tr>
<tr>
<td>Team cohesion</td>
<td>-.19**</td>
<td>-.11</td>
<td>-.18**</td>
<td>-.20**</td>
<td>-.27**</td>
<td>.12</td>
</tr>
<tr>
<td>Courtesy</td>
<td>-.16*</td>
<td>-.12</td>
<td>-.15*</td>
<td>-.12</td>
<td>-.20**</td>
<td>.02</td>
</tr>
<tr>
<td>Organizational commitment</td>
<td>-.07</td>
<td>-.04</td>
<td>-.06</td>
<td>-.02</td>
<td>-.09</td>
<td>.05</td>
</tr>
<tr>
<td>Affective</td>
<td>-.21**</td>
<td>-.04</td>
<td>-.18**</td>
<td>-.05</td>
<td>-.20**</td>
<td>.03</td>
</tr>
<tr>
<td>Normative</td>
<td>-.19**</td>
<td>.03</td>
<td>-.16*</td>
<td>-.10</td>
<td>-.17**</td>
<td>.03</td>
</tr>
<tr>
<td>High sacrifice</td>
<td>.10</td>
<td>-.03</td>
<td>.06</td>
<td>-.05</td>
<td>.05</td>
<td>.05</td>
</tr>
<tr>
<td>Low alternative</td>
<td>.18</td>
<td>-.05</td>
<td>.13</td>
<td>.14*</td>
<td>.09</td>
<td>.02</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01.
Relative Contributions of Trauma Exposure and the Organizational Climate

In order to ascertain the relative contributions of trauma exposure and the organizational variables (i.e., organizational climate and organizational commitment) in the prediction of traumatic stress symptoms and thereby evaluate hypothesis 11, a series of hierarchical multiple regression analyses were conducted. The IES-R served as the criterion measure for all analyses. The first analysis sought to determine how much of the variance in traumatic stress symptoms is accounted for by the organizational variables, above and beyond trauma exposure. The duration since the index trauma was entered in the first block of the regression equation. Trauma exposure was entered in the second block of the regression equation whereas the third block consisted of organizational stress, organizational commitment, organizational support, and team cohesion. As had been predicted by hypothesis 11, the results indicated that the organizational variables accounted for a significant proportion of the variance in traumatic stress symptoms, above and beyond trauma exposure (see Table 10). Distress pertaining to overall trauma exposure was the significant predictor within the second block of the regression equation, whereas team cohesion was the significant predictor within the third block of the regression equation.

Table 10
Contribution of the Organizational Variables in the Prediction of IES-R Scores, Above and Beyond Trauma Exposure (N = 247)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SEB</th>
<th>β</th>
<th>rsy</th>
<th>rPRED</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total duration</td>
<td>-.04</td>
<td>.24</td>
<td>-.01</td>
<td>-.01</td>
<td>-.02</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Block 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.20</td>
<td>.20***</td>
</tr>
<tr>
<td>Severity, overall trauma</td>
<td>.00</td>
<td>.01</td>
<td>.03</td>
<td>.02</td>
<td>.62**</td>
<td>.27</td>
<td>.07***</td>
</tr>
<tr>
<td>Distress, overall trauma</td>
<td>.01*</td>
<td>.01</td>
<td>.21</td>
<td>.13</td>
<td>.77**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity, index trauma</td>
<td>.01</td>
<td>.01</td>
<td>.05</td>
<td>.03</td>
<td>.69**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress, index trauma</td>
<td>.02</td>
<td>.01</td>
<td>.21</td>
<td>.12</td>
<td>.78**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.27</td>
<td>.07***</td>
</tr>
<tr>
<td>Organizational stress</td>
<td>.07</td>
<td>.04</td>
<td>.10</td>
<td>.11</td>
<td>.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational support</td>
<td>-.01</td>
<td>.01</td>
<td>-.07</td>
<td>-.08</td>
<td>-.36**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team cohesion</td>
<td>-.22***</td>
<td>.05</td>
<td>-.25</td>
<td>-.26</td>
<td>-.49**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational commitment</td>
<td>-.02</td>
<td>.04</td>
<td>-.03</td>
<td>-.04</td>
<td>-.21**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. B = unstandardized regression coefficient, SEB = standard error of B, β = standardized regression coefficient, rsy = zero-order correlation, rPRED = structure coefficient, R² = coefficient of multiple determination, ΔR² = change in R². *p < .05. **p < .01. ***p < .001.
The hierarchical multiple regression analysis was then repeated, including the subscales of the organizational climate and organizational commitment measures rather than the overall scales. The findings are presented in Table 11. As with the previous analysis and consistent with hypothesis 11, the organizational variables predicted a significant proportion of the variance above and beyond trauma exposure. Consistent with the previous analysis, distress related to overall trauma exposure was the only significant predictor within the second block of the regression equation. Within the third block of the regression equation, team cohesion was once again a significant predictor of traumatic stress symptoms. However, workload and affective commitment were also significant predictors of traumatic stress symptoms within the third block of the regression equation.

Table 11  
Contribution of the Organizational Variable Subscales in the Prediction of IES-R Scores, Above and Beyond Trauma Exposure (N = 247)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SEB</th>
<th>β</th>
<th>(r_{xy})</th>
<th>(r_{pred})</th>
<th>(R^2)</th>
<th>Δ(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total duration</td>
<td>-.04</td>
<td>.24</td>
<td>-.01</td>
<td>-.01</td>
<td>-.02</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Block 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.20</td>
<td>.20***</td>
</tr>
<tr>
<td>Severity, overall trauma</td>
<td>.00</td>
<td>.01</td>
<td>.03</td>
<td>.32</td>
<td>.58**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress, overall trauma</td>
<td>.02*</td>
<td>.01</td>
<td>.21</td>
<td>.40</td>
<td>.73**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity, index trauma</td>
<td>.01</td>
<td>.01</td>
<td>.05</td>
<td>.36</td>
<td>.65**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress, index trauma</td>
<td>.02</td>
<td>.01</td>
<td>.21</td>
<td>.40</td>
<td>.73**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.30</td>
<td>.11***</td>
</tr>
<tr>
<td>Autonomy</td>
<td>-.02</td>
<td>.02</td>
<td>-.05</td>
<td>-.05</td>
<td>-.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role clarity</td>
<td>.02</td>
<td>.06</td>
<td>.02</td>
<td>-.01</td>
<td>-.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utilization of skills</td>
<td>.03</td>
<td>.05</td>
<td>.04</td>
<td>.00</td>
<td>.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workload</td>
<td>.08**</td>
<td>.03</td>
<td>.16</td>
<td>.29</td>
<td>.52**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational support</td>
<td>.01</td>
<td>.01</td>
<td>.04</td>
<td>-.19</td>
<td>-.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team cohesion</td>
<td>-.16**</td>
<td>.06</td>
<td>-.19</td>
<td>-.25</td>
<td>-.46**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective commitment</td>
<td>-.05*</td>
<td>.02</td>
<td>-.18</td>
<td>-.28</td>
<td>-.50**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normative commitment</td>
<td>.01</td>
<td>.02</td>
<td>.03</td>
<td>-.16</td>
<td>-.28**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High sacrifice commitment</td>
<td>.01</td>
<td>.02</td>
<td>.05</td>
<td>.03</td>
<td>.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low alternative commitment</td>
<td>-.01</td>
<td>.03</td>
<td>-.03</td>
<td>.12</td>
<td>.21**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05, **p < .01, ***p < .001.

For exploratory purposes, the following hierarchical multiple regression analyses served to answer how much of the variance is accounted for by perceived trauma exposure above and beyond the organizational variables. Duration since the index
trauma was entered in the first block of the regression equation. Organizational stress, organizational commitment, perceived organizational support, and team cohesion were entered in the second block of the regression equation. Perceived trauma exposure was entered in the third block of the regression equation. The results are displayed in Table 12, which indicates that trauma exposure accounted for a significant proportion of the variance in traumatic stress symptoms, above and beyond the organizational variables. Organizational stress, organizational support, and team cohesion were the significant predictors within the second block of the regression equation, whereas none of the predictors within the third block of the regression equation were significant (although the block as a whole was significant).

The hierarchical multiple regression analysis was repeated, including the subscales of the various organizational climate and organizational commitment measures. The results are presented in Table 13. As with the previous analysis, trauma exposure predicted a significant proportion of the variance in traumatic stress symptoms, above and beyond the organizational variables. The specific predictors within the third block of the regression equation remained non-significant, despite the block as a whole being significant. When the subscales rather than the overall scales were considered, workload, team cohesion, and affective commitment were the significant predictors within the second block of the regression equation.

Table 12
Contribution of Trauma Exposure in the Prediction of IES-R Scores, Above and Beyond the Organizational Variables (N = 247)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SEB</th>
<th>β</th>
<th>r&lt;sub&gt;xy&lt;/sub&gt;</th>
<th>r&lt;sub&gt;PRED&lt;/sub&gt;</th>
<th>R&lt;sup&gt;2&lt;/sup&gt;</th>
<th>ΔR&lt;sup&gt;2&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total duration</td>
<td>-.04</td>
<td>.24</td>
<td>-.01</td>
<td>-.01</td>
<td>-.02</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Block 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.10</td>
<td>.10***</td>
</tr>
<tr>
<td>Organizational stress</td>
<td>.12*</td>
<td>.05</td>
<td>.16</td>
<td>.06</td>
<td>.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational support</td>
<td>-.02*</td>
<td>.01</td>
<td>-.14</td>
<td>-.19</td>
<td>-.36**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team cohesion</td>
<td>-.22***</td>
<td>.06</td>
<td>-.25</td>
<td>-.25</td>
<td>-.49**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational commitment</td>
<td>-.02</td>
<td>.04</td>
<td>-.03</td>
<td>-.11</td>
<td>-.21**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.27</td>
<td>.17***</td>
</tr>
<tr>
<td>Severity, overall trauma</td>
<td>.01</td>
<td>.01</td>
<td>.08</td>
<td>.32</td>
<td>.62**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress, overall trauma</td>
<td>.02</td>
<td>.01</td>
<td>.16</td>
<td>.40</td>
<td>.77**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity, index trauma</td>
<td>.01</td>
<td>.01</td>
<td>.06</td>
<td>.36</td>
<td>.69**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress, index trauma</td>
<td>.02</td>
<td>.01</td>
<td>.19</td>
<td>.40</td>
<td>.78**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05. **p < .01. ***p < .001.
Table 13
Contribution of Trauma Exposure in the Prediction of IES-R Scores, Above and Beyond the Organizational Variable Subscales (N = 247)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Block 1</th>
<th>Block 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>B</td>
<td>SEB</td>
</tr>
<tr>
<td>Total duration</td>
<td>-.04</td>
<td>.24</td>
</tr>
<tr>
<td>Autonomy</td>
<td>-.02</td>
<td>.02</td>
</tr>
<tr>
<td>Role clarity</td>
<td>.03</td>
<td>.07</td>
</tr>
<tr>
<td>Utilization of skills</td>
<td>.03</td>
<td>.05</td>
</tr>
<tr>
<td>Workload</td>
<td>.12***</td>
<td>.03</td>
</tr>
<tr>
<td>Organizational support</td>
<td>.00</td>
<td>.01</td>
</tr>
<tr>
<td>Team cohesion</td>
<td>-.15*</td>
<td>.06</td>
</tr>
<tr>
<td>Affective commitment</td>
<td>-.05*</td>
<td>.03</td>
</tr>
<tr>
<td>Normative commitment</td>
<td>.00</td>
<td>.02</td>
</tr>
<tr>
<td>High sacrifice commitment</td>
<td>.02</td>
<td>.02</td>
</tr>
<tr>
<td>Low alternative commitment</td>
<td>.00</td>
<td>.04</td>
</tr>
<tr>
<td>Severity, overall trauma</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>Distress, overall trauma</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>Severity, index trauma</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>Distress, index trauma</td>
<td>.02</td>
<td>.01</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01.

In summary, the organizational climate and organizational commitment predicted a significant proportion of the variance in traumatic stress symptoms, above and beyond perceived trauma exposure. These findings are consistent with hypothesis 11. More detailed inspection of the results indicated that team cohesion, workload, and affective commitment accounted for the role of the organizational environment in predicting traumatic stress symptoms. Notably, the characteristics of trauma exposure (i.e., severity and distress associated with overall and index trauma) also predicted a significant proportion of the variance above and beyond the perceived organizational environment. Together these findings suggest that the characteristics of trauma exposure, the organizational climate, and organizational commitment are all important in the prediction of traumatic stress symptoms.

Although the hierarchical multiple regression analyses presented above were employed to directly assess hypothesis 11, the structure coefficients presented in Tables 10 to 13 provide additional information pertaining to hypotheses 1(a) through 8(a). In further support of hypotheses 5(a) through 8(a), the structure coefficients presented in
Tables 10 and 12 reveal that greater predicted IES-R values were associated with less organizational support, team cohesion, and organizational commitment. Similarly, the structure coefficients presented in Tables 11 and 13 indicate that greater predicted IES-R values were associated with less team cohesion, greater low alternative commitment, and less affective and normative commitment. Mixed evidence for hypothesis 5(a) was found, such that less perceived organizational support was related to greater predicted IES-R values in Table 11 but not in Table 13. Despite the curvilinear relationship that was proposed in hypothesis 4(a), greater workload was associated with greater predicted IES-R values. Contrary to hypotheses 1(a) to 3(a), role clarity, utilization of skills, and autonomy were not significantly related to the predicted IES-R values, as presented in Tables 11 and 13.

**Moderating Relationships**

Hypotheses 1(b) through 6(b) predicted that role clarity, utilization of skills, autonomy, workload, perceived organizational support, and team cohesion would each moderate the relationship between trauma exposure and traumatic stress symptoms as well as the relationship between trauma exposure and posttraumatic growth. In order to evaluate these hypotheses, moderated multiple regression (MMR) was employed to investigate the existence of possible moderators.

Predictor variables were centered prior to entering the interaction term in the regression equation. IES-R scores served as the criterion variable and the predictors included one variable representing trauma exposure, one organizational climate variable, and the interaction term. MMR analyses were conducted for each aspect of trauma exposure (i.e., severity of overall trauma exposure, distress associated with overall trauma exposure, severity of the index trauma, and distress associated with the index trauma) in combination with each organizational climate variable (i.e., role clarity, utilization of skills, autonomy, workload, perceived organizational support, and team cohesion). These MMR analyses were then repeated using the PTGI scores as the criterion measure. Significant interactions are plotted using low, medium, and high values for each predictor and moderator variable, respectively representing one standard deviation below the mean, the mean value, and one standard deviation above the mean.

**MMR with Traumatic Stress Symptoms as the Criterion Variable**

In the first MMR analysis, IES-R scores served as the criterion variable and the severity of overall trauma exposure served as a predictor variable. Consistent with
hypothesis 3(b), autonomy moderated the relationship between the severity of overall trauma exposure and traumatic stress symptoms. The results are presented in Table 14. The findings indicate that autonomy has the potential to dampen the relationship between the severity of overall trauma exposure and traumatic stress symptoms. In other words, emergency service providers develop less traumatic stress symptoms when they have greater autonomy but develop greater traumatic stress symptoms when they have less autonomy. A visual depiction of the interaction is provided in Figure 3.

In contrast to hypotheses 1(b), 2(b), and 4(b) to 6(b), interactions between the severity of overall trauma exposure and each of the following organizational climate variables were not significant: organizational stress ($b_3 = -.05, \text{ ns}$), role clarity ($b_3 = -.01, \text{ ns}$), utilization of skills ($b_3 = -.06, \text{ ns}$), workload ($b_3 = -.13, \text{ ns}$), team cohesion ($b_3 = -.07, \text{ ns}$), and organizational support ($b_3 = -.08, \text{ ns}$). Therefore, these aspects of the organizational climate did not moderate the relationship between overall trauma exposure and traumatic stress symptoms.

In the second MMR analysis, IES-R scores served as the criterion variable and distress associated with overall trauma exposure served as the predictor variable. In further support of hypothesis 3(b), autonomy moderated the relationship between the distress associated with overall trauma exposure and traumatic stress symptoms. The results of the MMR analysis are presented in Table 15. The findings indicate that autonomy has the potential to dampen the relationship between distress associated with overall trauma exposure and traumatic stress symptoms. When emergency service providers become distressed by the overall trauma that they experience, they tend to develop less traumatic stress symptoms when they have greater autonomy but develop greater traumatic stress symptoms when they have less autonomy. A visual depiction of the interaction is provided in Figure 4.

The unstandardized regression coefficients for the remaining interactions were not significant and accordingly, did not provide support for hypotheses 1(b), 2(b), or 4(b) to 6(b). More specifically, interactions between overall distress and each of the following organizational climate variables were not significant: organizational stress ($b_3 = -.05, \text{ ns}$), role clarity ($b_3 = -.01, \text{ ns}$), utilization of skills ($b_3 = -.04, \text{ ns}$), workload ($b_3 = .09, \text{ ns}$), team cohesion ($b_3 = -.03, \text{ ns}$), and organizational support ($b_3 = -.09, \text{ ns}$). Therefore, these aspects of the organizational climate did not moderate the relationship between the distress associated with overall trauma exposure and traumatic stress symptoms.
Table 14

**MMR of the Impact of Autonomy on the Relationship between Traumatic Stress Symptoms and Overall Trauma Exposure (N = 249)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SEB</th>
<th>β</th>
<th>r_{xy}</th>
<th>r_{PRED}</th>
<th>R^2</th>
<th>ΔR^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total duration</td>
<td>-.05</td>
<td>.24</td>
<td>-.01</td>
<td>-.01</td>
<td>-.03</td>
<td>.00</td>
<td>-.00</td>
</tr>
<tr>
<td>Block 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity, overall trauma</td>
<td>.03***</td>
<td>.01</td>
<td>.32</td>
<td>.32</td>
<td>.93**</td>
<td>.11</td>
<td>.11***</td>
</tr>
<tr>
<td>Autonomy</td>
<td>-.01</td>
<td>.02</td>
<td>-.04</td>
<td>-.04</td>
<td>-.13*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity, overall trauma</td>
<td>.03***</td>
<td>.01</td>
<td>.33</td>
<td>.32</td>
<td>.93**</td>
<td>.12</td>
<td>.02*</td>
</tr>
<tr>
<td>Autonomy</td>
<td>-.01</td>
<td>.02</td>
<td>-.04</td>
<td>-.04</td>
<td>-.13*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trauma*autonomy</td>
<td>-.00*</td>
<td>.00</td>
<td>-.13</td>
<td>-.10</td>
<td>-.28**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note.** Criterion variable = IES-R.
* *p < .05. ** *p < .01. *** *p < .001.

Figure 3. MMR of the Impact of Autonomy on the Relationship between Traumatic Stress Symptoms and Overall Trauma Exposure (N = 249; \( \hat{Y}_{low} = .02x + 2.01 \); \( \hat{Y}_{mean} = .01x + 1.91 \); \( \hat{Y}_{high} = .00x + 1.82 \).
Table 15
**MMR of the Impact of Autonomy on the Relationship between Traumatic Stress Symptoms and Overall Distress (N = 249)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>SEB</th>
<th>$\beta$</th>
<th>$r_{xy}$</th>
<th>$r_{PRED}$</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total duration</td>
<td>-.05</td>
<td>.24</td>
<td>-.01</td>
<td>-.01</td>
<td>-.02</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Block 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall distress</td>
<td>.04***</td>
<td>.01</td>
<td>.40</td>
<td>.40</td>
<td>.96**</td>
<td>.16</td>
<td>.16***</td>
</tr>
<tr>
<td>Autonomy</td>
<td>-.01</td>
<td>.02</td>
<td>-.04</td>
<td>-.04</td>
<td>-.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall distress</td>
<td>.04***</td>
<td>.01</td>
<td>.41</td>
<td>.40</td>
<td>.96**</td>
<td>.18</td>
<td>.01*</td>
</tr>
<tr>
<td>Autonomy</td>
<td>-.01</td>
<td>.02</td>
<td>-.04</td>
<td>-.04</td>
<td>-.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress*autonomy</td>
<td>-.00*</td>
<td>.00</td>
<td>-.12</td>
<td>-.09</td>
<td>-.20**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Criterion variable = IES-R.

*p < .05. **p < .01. ***p < .001.

Figure 4. MMR of the Impact of Autonomy on the Relationship between Traumatic Stress Symptoms and Overall Distress (N = 249; $\hat{Y}_{low} = .03x + 2.05$; $\hat{Y}_{mean} = .02x + 1.97$; $\hat{Y}_{high} = .01x + 1.88$)
In the third MMR analysis, IES-R scores served as the criterion variable. Severity of the index trauma served as a predictor variable. Consistent with hypothesis 4(b), workload moderated the relationship between the severity of the index trauma and traumatic stress symptoms. Results of the MMR analysis are presented in Table 16 and Figure 5. The findings indicate that workload has the potential to magnify the relationship between the severity of the index trauma and traumatic stress symptoms. When faced with a severe traumatic event (i.e., index trauma), emergency service providers tend to develop less traumatic stress symptoms when they have smaller workloads, but tend to develop greater traumatic stress symptoms when they have larger workloads.

The unstandardized regression coefficients for the remaining interactions were not significant. More specifically, interactions between severity of the index trauma and each of the following organizational climate variables were not significant: organizational stress \( b_3 = .04, \text{ns} \), role clarity \( b_3 = .02, \text{ns} \), utilization of skills \( b_3 = -.00, \text{ns} \), team cohesion \( b_3 = -.03, \text{ns} \), and organizational support \( b_3 = -.03, \text{ns} \). Therefore, these aspects of the organizational climate did not moderate the relationship between the severity of the index trauma and traumatic stress symptoms and as such, these findings did not provide support for hypotheses 1(b) to 3(b) or hypotheses 5(b) and 6(b).

In the next MMR analysis, IES-R scores served as the criterion variable. Distress (index trauma) served as the predictor variable. In support of hypothesis 4(b), workload moderated the relationship between distress associated with the index trauma and traumatic stress symptoms. Results of the MMR analysis are presented in Table 17 and Figure 6. The findings indicate that workload has the potential to magnify the relationship between the distress and traumatic stress symptoms. More specifically, when emergency service providers become distressed by an index trauma, they tend to develop less traumatic stress symptoms if they have smaller workloads but tend to develop more traumatic stress symptoms when they have greater workloads.

The unstandardized regression coefficients for the remaining interactions were not significant, meaning that the findings did not provide support for hypotheses 1(b) to 3(b) or hypotheses 5(b) and 6(b). More specifically, interactions between distress and each of the following organizational climate variables were not significant: organizational stress \( b_3 = .03, \text{ns} \), role clarity \( b_3 = .02, \text{ns} \), utilization of skills \( b_3 = -.05, \text{ns} \), team cohesion \( b_3 = -.02, \text{ns} \), and organizational support \( b_3 = -.06, \text{ns} \). Therefore, these aspects of the organizational climate did not moderate the relationship between the distress associated with the index trauma and traumatic stress symptoms.
Table 16
MMR of the Impact of Workload on the Relationship between Traumatic Stress Symptoms and Severity of the Index Trauma (N = 249)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SEB</th>
<th>β</th>
<th>rxy</th>
<th>rPRED</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total duration</td>
<td>-.05</td>
<td>.24</td>
<td>-.01</td>
<td>-.01</td>
<td>-.02</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Block 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity, index trauma</td>
<td>.03***</td>
<td>.01</td>
<td>.31</td>
<td>.35</td>
<td>.80**</td>
<td>.17</td>
<td>.17***</td>
</tr>
<tr>
<td>Workload</td>
<td>.11***</td>
<td>.03</td>
<td>.22</td>
<td>.29</td>
<td>.64**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity, index trauma</td>
<td>.03***</td>
<td>.01</td>
<td>.32</td>
<td>.35</td>
<td>.80**</td>
<td>.20</td>
<td>.02**</td>
</tr>
<tr>
<td>Workload</td>
<td>.10***</td>
<td>.03</td>
<td>.21</td>
<td>.29</td>
<td>.64**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trauma*workload</td>
<td>.00**</td>
<td>.00</td>
<td>.16</td>
<td>.14</td>
<td>.32**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Criterion variable = IES-R.  
**p < .01. ***p < .001.

Figure 5. MMR of the Impact of Workload on the Relationship between Traumatic Stress Symptoms and Severity the Index Trauma (N = 249; \( \hat{Y}_{low} = .10x + 3.79 \); \( \hat{Y}_{mean} = .12x + 4.28 \); \( \hat{Y}_{high} = .14x + 4.78 \))
Table 17
**MMR of the Impact of Workload on the Relationship between Traumatic Stress Symptoms and Distress (Index Trauma; N = 249)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SEB</th>
<th>β</th>
<th>rxy</th>
<th>r_PRED</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Block 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total duration</td>
<td>-05</td>
<td>04</td>
<td>-01</td>
<td>-01</td>
<td>-02</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td><strong>Block 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress, index trauma</td>
<td>.04***</td>
<td>.01</td>
<td>.36</td>
<td>.40</td>
<td>.85**</td>
<td>.20</td>
<td>.20***</td>
</tr>
<tr>
<td>Workload</td>
<td>.10***</td>
<td>.03</td>
<td>.21</td>
<td>.29</td>
<td>.60**</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Block 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress, index trauma</td>
<td>.04***</td>
<td>.01</td>
<td>.37</td>
<td>.40</td>
<td>.85**</td>
<td>.22</td>
<td>.02**</td>
</tr>
<tr>
<td>Workload</td>
<td>.10***</td>
<td>.03</td>
<td>.21</td>
<td>.29</td>
<td>.60**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress*workload</td>
<td>.00**</td>
<td>.00</td>
<td>.15</td>
<td>.12</td>
<td>.24**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Criterion variable = IES-R.
**p < .01. ***p < .001.

Figure 6. MMR of the Impact of Workload on the Relationship between Traumatic Stress Symptoms and Distress (Index Trauma; N = 249; Y_low = .09x + 3.72; Y_mean = .10x + 4.21; Y_high = .12x + 4.71)
MMR with Posttraumatic Growth as the Criterion Variable

Hypotheses 1(b) through 6(b) predicted that role clarity, utilization of skills, autonomy, workload, perceived organizational support, and team cohesion would moderate the relationship between trauma exposure and posttraumatic growth. Accordingly, the preceding MMR analyses were repeated using PTGI scores as the criterion variable.

In the following MMR analysis, PTGI scores served as the criterion variable and the severity of overall trauma exposure served as the predictor variable. Consistent with hypothesis 5(b), perceived organizational support was found to moderate the relationship between the severity of overall trauma exposure and posttraumatic growth. The results are presented in Table 18 and Figure 7. The findings indicate that perceived organizational support has the potential to enhance the relationship between the severity of overall trauma exposure and posttraumatic growth. In the face of overall trauma exposure, emergency service providers tend to develop greater posttraumatic growth when perceived organizational support is high, but develop less posttraumatic growth when perceived organizational support is low.

Interactions between the severity of overall trauma exposure and each of the following organizational climate variables were not significant in predicting posttraumatic growth: organizational stress, role clarity, utilization of skills, workload, and team cohesion \((b_3 = .00, \text{ ns for all predictors})\). These findings did not provide support for hypotheses 1(b) to 4(b) and hypothesis 6(b).

### Table 18

**MMR of the Impact of Perceived Organizational Support on the Relationship between Traumatic Stress Symptoms and Overall Trauma Exposure; \(N = 249\)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>(B)</th>
<th>(SE)</th>
<th>(\beta)</th>
<th>(r_{xy})</th>
<th>(r_{PRED})</th>
<th>(R^2)</th>
<th>(\Delta R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Block 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total duration</td>
<td>.16</td>
<td>.53</td>
<td>.02</td>
<td>.02</td>
<td>.07</td>
<td></td>
<td>.00</td>
</tr>
<tr>
<td><strong>Block 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.07***</td>
</tr>
<tr>
<td>Severity, overall trauma</td>
<td>.05***</td>
<td>.01</td>
<td>.25</td>
<td>.25</td>
<td>.78**</td>
<td></td>
<td>.00</td>
</tr>
<tr>
<td>Organizational support</td>
<td>.03</td>
<td>.02</td>
<td>.10</td>
<td>.09</td>
<td>.26**</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Block 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.10</td>
</tr>
<tr>
<td>Severity, overall trauma</td>
<td>.06***</td>
<td>.01</td>
<td>.26</td>
<td>.25</td>
<td>.78**</td>
<td></td>
<td>.03**</td>
</tr>
<tr>
<td>Organizational support</td>
<td>.00</td>
<td>.00</td>
<td>.17</td>
<td>.09</td>
<td>.26**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trauma*support</td>
<td>.00**</td>
<td>.00</td>
<td>.17</td>
<td>.16</td>
<td>.52**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. Criterion variable = PTGI.

**\(p < .01\). ***\(p < .001.**
For the next series of MMR analyses, PTGI scores served as the criterion variable and distress associated with overall trauma exposure served as the predictor variable. Interactions between overall distress and each of the following organizational climate variables were not significant: organizational stress, role clarity, utilization of skills, workload, team cohesion, and organizational support (b<sub>3</sub> = .00, ns for all predictors). Accordingly, these findings did not support hypotheses 1(b) through 6(b).

In the following series of MMR analyses, PTGI scores served as the criterion variable and severity of the index trauma served as a predictor variable. Interactions between severity of the index trauma and each of the following organizational climate variables were not significant: organizational stress, role clarity, utilization of skills, workload, team cohesion, and organizational support (b<sub>3</sub> = .00, ns for all predictors). These findings did not support hypotheses 1(b) through 6(b).
For the final series of MMR analyses, PTGI scores served as the criterion variable and distress pertaining to the index trauma served as a predictor variable. Interactions between distress and each of the following organizational climate variables were not significant: organizational stress, role clarity, utilization of skills, workload, team cohesion, and organizational support ($b_3 = .00$, ns for all predictors). These findings did not support hypotheses 1(b) through 6(b).

**Mediating Relationships**

It was hypothesized that organizational commitment might mediate the relationship between trauma exposure and traumatic stress symptoms as well as the relationship between trauma exposure and posttraumatic growth. It was also noted in the data analytic approach (outlined on page 63) that those organizational climate variables that did not function as moderators might function as mediators of the aforementioned relationships. However, before path analysis could be employed to ascertain whether mediational relationships exist among the variables, the basic structural model that linked trauma exposure, distress, traumatic stress symptoms, and posttraumatic growth needed to be tested. Three steps were involved in this process: (1) the basic structural model linking the severity of trauma exposure, distress associated with trauma exposure, traumatic stress symptoms, and posttraumatic growth was established and tested, (2) nonsignificant pathways were trimmed, and (3) the model was retested. The potential mediating role of each type of organizational commitment (i.e., affective, normative, high sacrifice, and low alternative commitment) was then tested. Subsequently, those organizational climate variables that did not function as moderators in the MMR analyses presented above (e.g., team cohesion) were evaluated as possible mediators.

**Analysis of Moment Structures (AMOS, Version 16)** was used to conduct each of the following path analyses. Maximum likelihood estimation was used to fit the model to the data. The adequacy of each model was evaluated based on $\chi^2$ goodness-of-fit test (GFI), comparative fit index (CFI; Bentler, 1990), Tucker-Lewis coefficient (TLI; Bentler & Bonnet, 1980; Tucker & Lewis, 1973), and root mean square error of approximation (RMSEA; Steiger, 1990).

**Trauma Model**

The basic structural model was established based on the temporal sequence of events as well as previous research. Specifically, trauma exposure precedes psychological distress. Accordingly, a direct pathway from trauma exposure to distress
was included in the path model. Traumatic stress symptoms and posttraumatic growth are commonly employed as outcome variables throughout the trauma literature; however, traumatic stress symptoms are understood to precede posttraumatic growth (e.g., Butler, 2007). For this reason, a direct pathway from traumatic stress symptoms to posttraumatic growth was included in the path diagram. It was unclear whether trauma exposure itself, the subsequent distress, or both are responsible for the development of traumatic stress and posttraumatic growth. It is reasonable to believe that distress is a necessary but not sufficient condition for the development of traumatic stress, since distress is specified in the DSM-IV-TR criteria for PTSD. However, the relative contributions of trauma exposure and distress in the development of posttraumatic growth have not been elucidated in the literature. Accordingly, direct pathways were included from trauma exposure and distress to both traumatic stress and posttraumatic growth. The path model is displayed in Figure 8. The standardized regression weights are presented in the diagram. Solid arrows represent significant pathways, whereas dashed arrows represent nonsignificant pathways.

Figure 8. Just-Identified Path Diagram of the Relationship between Trauma Exposure, Distress, and Trauma Sequelae (N = 250).
Given that this model was just identified, the two non-significant pathways were trimmed and the model was re-tested. This model is displayed in Figure 9 and was found to yield good model fit, based on the following fit indices: $\chi^2 (2) = .40$, $ns$, CFI = 1.00, TLI = 1.02, RMSEA = .00. The path diagram indicates that increased trauma exposure is associated with increased distress, which is predictive of increased traumatic stress symptoms. Bootstrapping (with 1000 bootstrap samples) indicated that the total indirect pathway from trauma exposure to traumatic stress was significant (95% CI = .021 to .035). In contrast, two different pathways contributed to the development of posttraumatic growth. Increased trauma exposure was directly associated with increased posttraumatic growth. Alternately, increased trauma exposure is associated with increased distress, which is predictive of increased traumatic stress symptoms and finally, increased posttraumatic growth. Bootstrapping (with 1000 bootstrap samples) revealed that the total indirect pathway from trauma exposure to posttraumatic growth was significant (95% CI = .004 to .019). Together the findings suggest that distress appears to be a necessary condition for the development of traumatic stress symptoms, but not posttraumatic growth.

Figure 9. Identified Path Diagram of the Relationship between Trauma Exposure, Distress, and Trauma Sequelae ($N = 250$)
Mediating Relationships: Overall Approach

Based on the results presented in Figure 9, the following analyses investigated whether organizational commitment and aspects of the organizational climate mediate the relationship between distress and traumatic stress symptoms as well as the relationship between trauma exposure and posttraumatic growth. The potential mediating role of each organizational variable was tested separately in a series of path analyses (described in detail below). It is also important to note that each of the subsequent path analyses were conducted twice, as follows: (1) the path models were tested using the severity and distress associated with overall trauma exposure and (2) the path models were tested using the severity and distress associated with index trauma. Results of the former analysis are presented in detail; however, the latter is noted only in terms of discrepancies with the former analyses for the sake of brevity.

The following analyses are grouped into two sections. The first section pertains to hypotheses 7 and 8, which predicted that the various types of organizational commitment would mediate the relationship between trauma exposure and each of traumatic stress and posttraumatic growth. The second section pertains to those variables that did not function as moderators in the MMR analyses presented above. Consistent with the data analytic approach outlined on page 63, those variables that did not function as moderators are evaluated as possible mediators in the relationship between trauma exposure and each of traumatic stress and posttraumatic growth.

The Role of Organizational Commitment

Hypotheses 7 and 8 predicted that affective, normative, high sacrifice, and low alternative commitment would mediate the relationship between trauma exposure and traumatic stress symptoms as well as the relationship between trauma exposure and posttraumatic growth. Based on the results presented in Figure 9 as well as hypotheses 7 and 8, organizational commitment was added to the model as a possible mediator of the relationship between distress and traumatic stress as well as the relationship between trauma exposure and posttraumatic growth. This model was tested separately for affective, normative, high sacrifice, and low alternative commitment.

In order to evaluate hypothesis 7, affective commitment was added to the path diagram as a mediator of the relationship between distress associated with overall trauma exposure and traumatic stress as well as the relationship between overall trauma exposure and posttraumatic growth. This model is displayed in Figure 10 and yielded good model fit, \( \chi^2 (2) = .90, \, ns, \, CFI = 1.00, \, TLI = 1.02, \, RMSEA = .00. \) The findings
indicated that emergency service providers' affective commitment mediated the relationship between distress and traumatic stress, consistent with hypothesis 7. More severe trauma exposure led to greater distress, which was associated with less affective commitment and finally, greater traumatic stress. Therefore, as emergency service providers became increasingly distressed from the traumatic events that they encountered, their emotional commitment to the organization decreased and they experienced greater traumatic stress. Using bootstrapping (with 1000 bootstrap samples), the total indirect pathway (.03) was found to be significant (95% CI = .020 to .035). In contrast to hypothesis 9, emergency service providers' affective commitment did not mediate the relationship between trauma exposure and posttraumatic growth.

When the path model was retested substituting trauma exposure and distress associated with overall trauma exposure for trauma exposure and distress associated with the index trauma, the same pattern of results was found.

Figure 10. The Role of Affective Commitment in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae (N = 250)
Normative commitment was also considered as a mediator of the relationship between distress associated with overall trauma exposure and traumatic stress and the relationship between overall trauma exposure and posttraumatic growth, as had been proposed in hypothesis 7. This model is displayed in Figure 11 and was found to yield good model fit, \( \chi^2 (2) = .41, \) \( ns, \) CFI = 1.00, TLI = 1.03, RMSEA = .00. The findings did not support hypothesis 7 but rather, the findings indicated that emergency service providers' normative commitment did not mediate the relationship between distress and traumatic stress or the relationship between trauma exposure and posttraumatic growth. Instead, emergency service providers' normative commitment had a direct relationship with traumatic stress and posttraumatic growth. Specifically, greater normative commitment was associated with less traumatic stress symptoms but greater posttraumatic growth. Therefore, as emergency service providers felt an increasing sense of obligation to remain with their organization, they tended to develop less traumatic stress symptoms and greater posttraumatic growth.

Figure 11. The Role of Normative Commitment in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae (\( N = 250 \))
The pattern of results changed when trauma exposure and distress pertaining to overall trauma were replaced with trauma exposure and distress associated with index trauma. The findings indicated that in the case of index trauma, normative commitment no longer had a direct relationship with traumatic stress but continued to have a direct relationship with posttraumatic growth. This model is displayed in Figure 12 and yielded good model fit, $\chi^2 (2) = 1.34$, $ns$, CFI = 1.00, TLI = 1.01, RMSEA = .00.

Figure 12. The Role of Normative Commitment in the Relationship between Index Trauma, Distress, and Trauma Sequelae ($N = 250$)

High sacrifice commitment was investigated as a possible mediator of the relationship between distress associated with overall trauma exposure and traumatic stress and the relationship between overall trauma exposure and posttraumatic growth, as had been proposed in hypothesis 8. This model is displayed in Figure 13 and was found to yield good model fit, $\chi^2 (2) = .38$, $ns$, CFI = 1.00, TLI = 1.03, RMSEA = .00. The findings did not lend support for hypothesis 8. Instead, high sacrifice commitment did not
mediate the relationship between distress and traumatic stress or the relationship between trauma exposure and posttraumatic growth. High sacrifice commitment was not significantly related to traumatic stress symptoms or posttraumatic growth.

When the path model was retested substituting trauma exposure and distress associated with overall trauma exposure for trauma exposure and distress associated with the index trauma, the same pattern of results was found.

![Diagram](image)

Figure 13. The Role of High Sacrifice Commitment in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae (N = 250)

Low alternative commitment was assessed as a possible mediator of the relationship between distress associated with overall trauma exposure and traumatic stress and the relationship between overall trauma exposure and posttraumatic growth, as had been proposed in hypothesis 8. This model is displayed in Figure 14 and was found to yield good model fit, $\chi^2 (2) = .34$, ns, CFI = 1.00, TLI = 1.03, RMSEA = .00. The findings did not support hypothesis 8 given that low alternative commitment did not
mediate the relationship between distress and traumatic stress or the relationship between trauma exposure and posttraumatic growth. Furthermore, low alternative commitment was not significantly related to traumatic stress symptoms or posttraumatic growth.

When the path model was retested substituting trauma exposure and distress associated with overall trauma exposure for trauma exposure and distress associated with the index trauma, the same pattern of results was found.

![Figure 14. The Role of Low Alternative Commitment in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae (N = 250)](image)

The Role of the Organizational Climate

As explained in the section titled, Data Analytic Strategy (p. 63), the integration of the traumatic stress and organizational psychology literature is in its infancy. Accordingly, a priori hypotheses were specified based on the literature but those hypotheses were intended to serve as loose guidelines spanning the continuum of exploratory to confirmatory research. The data analytic strategy proposed that those
organizational climate variables that did not function as moderators would also be tested as mediators. Role clarity, utilization of skills, and team cohesion were inspected as possible mediators [i.e., hypotheses 1(b), 2(b), and 6(b)]. Since autonomy moderated the relationship between overall trauma exposure and traumatic stress, it was tested as a mediator in the context of index trauma and also in the relationship between overall trauma exposure and posttraumatic growth [hypothesis 3(b)]. Workload moderated the relationship between index trauma and traumatic stress. As such, workload was tested as a mediator in the context of overall trauma and of the relationship between index trauma and posttraumatic growth [hypothesis 4(b)]. Perceived organizational support moderated the relationship between overall trauma exposure and posttraumatic growth. As such, perceived organizational support was tested as a mediator in the context of index trauma and also in the relationship between overall trauma and traumatic stress [hypothesis 5(b)].

In order to test hypothesis 5, perceived organizational support was added to the model, as a possible mediator of the relationship between distress associated with overall trauma exposure and traumatic stress. This model is displayed in Figure 15 and demonstrated reasonable model fit, $\chi^2 (4) = 7.43$, ns, CFI = .99, TLI = .97, RMSEA = .06. Consistent with hypothesis 5, the findings indicated that emergency service providers’ perceived organizational support mediated the relationship between distress and traumatic stress. More severe trauma exposure led to greater distress, which was associated with less organizational support and greater traumatic stress symptoms. Bootstrapping (with 1000 bootstrap samples) yielded a total indirect pathway (.01) that was significant (95% CI = .020 to .035). Organizational support also mediated the relationship between trauma exposure and posttraumatic growth, providing further support for hypothesis 5. More specifically, more severe overall trauma exposure was associated with greater distress, which predicted decreased organizational support, increased traumatic stress symptoms, and finally, greater posttraumatic growth.

The path model was then retested substituting trauma exposure and distress associated with overall trauma exposure for trauma exposure and distress associated with the index trauma. The same pattern of results was found, providing further support for hypothesis 5. In addition, greater perceived organizational support was directly associated with greater posttraumatic growth (standardized regression weight = .14, $p < .05$). As a result, another pathway was detected in which organizational support mediated the relationship between trauma exposure and posttraumatic growth. Greater
trauma exposure was associated in greater distress, which predicted less organizational support and less posttraumatic growth. This finding provided further support for hypothesis 5. Overall, the model demonstrated good model fit, $\chi^2 (2) = 1.52$, $ns$, CFI = 1.00, TLI = 1.01, RMSEA = .00.

![Diagram](image)

Figure 15. The Role of Perceived Organizational Support in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae ($N = 250$)

In order to evaluate hypothesis 6, team cohesion was investigated as a possible mediator of the relationship between distress and traumatic stress as well as the relationship between trauma exposure and posttraumatic growth. This model is displayed in Figure 16 and was found to yield good model fit, $\chi^2 (2) = 1.8$, $ns$, CFI = 1.00, TLI = 1.00, RMSEA = .00. Consistent with hypothesis 6, team cohesion was involved in two mediating pathways. (1) Increased trauma exposure was associated with increased team cohesion, which predicted decreased traumatic stress symptoms. (2) More severe trauma exposure was associated with greater distress, which predicted decreased team cohesion and thereby, increased traumatic stress symptoms.
Accordingly, the magnitude of distress that emergency service providers experience plays a pivotal role in determining the degree of team cohesion and thereby, the severity of traumatic stress symptoms. Using bootstrapping (with 1000 bootstrap samples), the total indirect pathways (.10) were significant (95% CI = .018 to .034). Team cohesion also mediated the relationship between trauma exposure and posttraumatic growth, providing further support for hypothesis 6. More specifically, more severe overall trauma exposure was associated with greater distress, which predicted decreased team cohesion, increased traumatic stress symptoms, and finally, greater posttraumatic growth.

*Figure 16. The Role of Team Cohesion in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae (N = 250)*

When the path model was retested substituting trauma exposure and distress associated with overall trauma exposure for trauma exposure and distress associated with the index trauma, the following pattern of results were found. Trauma exposure and distress were no longer significantly related to team cohesion but greater team cohesion...
was directly associated with less traumatic stress. This finding suggests that in the case of index trauma, team cohesion directly contributes to reductions in traumatic stress symptoms. As with the previous analysis, team cohesion was not significantly related to posttraumatic growth. Although the model yielded good model fit, $\chi^2 (2) = 2.78$, ns, CFI = 1.00, TLI = .99, RMSEA = .04, these findings were inconsistent with hypothesis 6.

Workload was evaluated as a possible mediator of the relationship between distress associated with overall trauma exposure and traumatic stress and the relationship between overall trauma exposure and posttraumatic growth. The model yielded good model fit, $\chi^2 (2) = .35$, ns, CFI = 1.00, TLI = 1.03, RMSEA = .00 (see Figure 17). The Emergency service providers' workload mediated the relationship between distress and traumatic stress. More severe trauma exposure led to greater distress, which was associated with increased workload and greater traumatic stress. Using bootstrapping (with 1000 bootstrap samples), the total indirect pathway (.03) was significant (95% CI = .021 to .036). The path diagram indicated that workload did not mediate the relationship between trauma exposure and posttraumatic growth.

Figure 17. The Role of Workload in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae ($N = 250$)
The path model was retested substituting trauma exposure and distress associated with overall trauma exposure for trauma exposure and distress associated with the index trauma. Workload was examined as a mediator of the relationship between index trauma and posttraumatic growth only, given that workload functioned as a moderator the relationship between trauma exposure and traumatic stress. More severe index trauma was associated with greater workload (standardized regression weight = .21, p < .001). Workload was not significantly related to posttraumatic growth.

Utilization of skills was then considered as a possible mediator of the relationship between distress and traumatic stress and the relationship between trauma exposure and posttraumatic growth. This model is displayed in Figure 18 and was found to yield good model fit, $\chi^2 (2) = .40, ns, CFI = 1.00, TLI = 1.03, RMSEA = .00$. The findings indicated that utilization of skills did not mediate the relationship between distress and traumatic stress or the relationship between trauma exposure and posttraumatic growth. Instead, trauma exposure had a direct, positive relationship with utilization of skills; however, utilization of skills was not related to traumatic stress or posttraumatic growth.

Figure 18. The Role of Utilization of Skills in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae ($N = 250$)
When the path model was retested substituting trauma exposure and distress associated with overall trauma exposure for trauma exposure and distress associated with the index trauma, the same pattern of results was found.

The model was then evaluated with role clarity as a possible mediator of the relationship between distress and traumatic stress and the relationship between trauma exposure and posttraumatic growth. This model is displayed in Figure 19 and was found to yield good model fit, $\chi^2 (2) = .90, ns$, CFI = 1.00, TLI = 1.02, RMSEA = .00. The findings indicated that role clarity did not mediate the relationship between distress and traumatic stress or the relationship between trauma exposure and posttraumatic growth. Instead, trauma exposure had a direct, positive relationship with role clarity. Role clarity was not related to traumatic stress or posttraumatic growth.

When the path model was retested substituting trauma exposure and distress associated with overall trauma exposure for trauma exposure and distress associated with the index trauma, role clarity was not significantly related to any of the variables in the path diagram.

Figure 19. The Role of Role Clarity in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae ($N = 250$)
Autonomy was examined as a mediator of the relationship between overall trauma exposure and posttraumatic growth only, given that autonomy was found to moderate the relationship between trauma exposure and traumatic stress. The findings indicated that autonomy did not mediate the relationship between trauma exposure and posttraumatic growth. Instead, autonomy had a direct relationship with posttraumatic growth such that greater autonomy was associated with greater posttraumatic growth. Trauma exposure was not significantly related to autonomy. The model yielded good model fit, $\chi^2 (4) = .84, ns$, CFI = 1.00, TLI = 1.03, RMSEA = .00.

Figure 20. The Role of Autonomy in the Relationship between Trauma Exposure, Distress, and Trauma Sequelae ($N = 250$)

Autonomy was then evaluated as a possible mediator of the relationship between distress associated with index trauma exposure and traumatic stress and the relationship between index trauma exposure and posttraumatic growth. The model yielded good model fit, $\chi^2 (2) = 1.49, ns$, CFI = 1.00, TLI = 1.01, RMSEA = .00 (see
Figure 20). The findings indicate that autonomy did not mediate either relationship. Consistent with the aforementioned findings for overall trauma, autonomy had a direct relationship with posttraumatic growth in the context of index trauma. That is, greater autonomy was associated with greater posttraumatic growth. The remaining relationships between autonomy and the other variables in the model were not significant.
Chapter V: Discussion

Summary

The objective of this study was to identify the means through which emergency service providers' organizational climate and organizational commitment might be related to the presence of traumatic stress symptoms and posttraumatic growth. Participants were a sample of Canadian emergency service providers. The study utilized self-report data obtained from an anonymous internet survey. Measures of traumatic stress symptoms, posttraumatic growth, multiple dimensions of job stress (i.e., workload, role clarity, utilization of skills, and autonomy), organizational commitment, organizational support, and team cohesion were included in the study. A summary of the hypotheses and results obtained in the present study is presented in Appendix G.

Trauma Model

Although exposure to traumatic events is a necessary precursor to the development of traumatic stress, the relationship between trauma exposure and traumatic stress among emergency service providers has been mixed. The relationship between trauma exposure and traumatic stress has been non-significant in some studies (e.g., Bryant & Guthrie, 2005; Hafeez, 2003; Lowery & Stokes, 2005) but significant in other studies (e.g., Bryant & Harvey, 1996; Drexel, 2006; Hodgins, Creamer, & Bell, 2001). One possible explanation for the mixed findings might be variations in the operationalization of trauma exposure. Some studies employed frequency ratings of the number of traumatic events experienced (e.g., Monnier, Cameron, Hobfoll, & Gribble, 2002). Trauma exposure that is operationalized in this fashion is most consistent with the definition of traumatic stressors in the DSM-III and DSM-III-R, which placed the greatest weight on the event itself (Everly & Lating, 2004). In contrast, the DSM-IV places the greatest emphasis on the reaction of the individual to the event (Everly & Lating, 2004). Implicit in this shift is that in order for an event to be recognized as traumatic, it must have been perceived as such by the individual in question. Although the frequency approach is easily quantifiable, it overlooks the current DSM-IV definition of a traumatic stressor that includes individuals' subjective experience of the event. This discrepancy is particularly important among emergency service providers because they commonly experience death and destruction; however, emergency service providers also identify traumatic events as including low-profile events that connect with them on a highly personal level (e.g., Regehr & Bober, 2005). Some studies have attempted to measure emergency service providers' perceptions of potentially traumatic events by
asking participants to appraise how “stressful” various events had been (e.g., Beaton, Murphy, Johnson, Pike, & Corneil, 1998). Despite the increasing recognition of the importance of measuring emergency service providers’ perceptions of the events that they experience, there have been no published studies comparing the relationship between trauma severity, emergency service providers’ subjective experience of those events, and traumatic stress symptoms.

The current study asked emergency service providers to rate the severity of their trauma exposure as well as the degree of distress associated with those events. The present study found that the severity of trauma exposure was positively correlated with traumatic stress symptoms and posttraumatic growth. Similarly, the distress associated with trauma exposure was positively correlated with traumatic stress symptoms and posttraumatic growth. The correlations between trauma exposure and distress did not exceed $r = .80$, suggesting that these variables were not redundant (Tabachnick & Fidell, 2001). Interestingly, path analysis revealed that trauma exposure was indirectly related to traumatic stress symptoms such that trauma exposure was related to distress and, in turn, distress was related to traumatic stress symptoms. However, the direct relationship between trauma exposure and traumatic stress symptoms was not significant. These findings suggest that the measurement of emergency service providers’ subjective experience of the events might account for the mixed findings in previous research.

**Correlational Analyses**

The present study also sought to ascertain whether fewer traumatic stress symptoms and greater posttraumatic growth would be correlated with less organizational stress but greater organizational support, team cohesion, and organizational commitment. Results from correlational analyses and structure coefficients partially supported the hypotheses such that greater traumatic stress symptoms were correlated with greater workload and low alternative commitment but less autonomy, organizational support, team cohesion, affective commitment, and normative commitment. The correlations between traumatic stress symptoms and role clarity, utilization of skills, and high sacrifice commitment were not significant. The correlations with posttraumatic growth revealed a different pattern of results, such that posttraumatic growth was not significantly correlated with any of the organizational variables except organizational support. In summary, the overall findings indicated that a more positive organizational climate tended to be associated with less traumatic stress whereas most organizational climate variables and all organizational commitment variables were unrelated to
posttraumatic growth. The findings also revealed that organizational commitment was associated with traumatic stress but not posttraumatic growth. The direction of the relationship depended on the type of organizational commitment.

The relationship between absenteeism, the organizational climate, organizational commitment, and trauma symptoms was also examined in the present study. The results indicated that greater traumatic stress symptoms were correlated with greater absenteeism, as measured by days of missed work in the following categories: illness, workplace injury, and mental health. In contrast, posttraumatic growth was not correlated with absenteeism. In terms of the relationship between absenteeism and the organizational climate, less absenteeism was correlated with less organizational stress and greater organizational support, and team cohesion. Less absenteeism was correlated with greater affective and normative commitment but less low alternative commitment. Overall, the findings revealed that less absenteeism was associated with less traumatic stress, a positive organizational climate, and positive organizational commitment; however, absenteeism was unrelated to posttraumatic growth.

**Relative Contributions**

In order to ascertain the relative contributions of trauma exposure and the organizational variables (i.e., organizational climate and organizational commitment) to the prediction of traumatic stress symptoms, a series of hierarchical multiple regression analyses were employed. In support of the hypotheses, the organizational variables accounted for a significant proportion of the variance in traumatic stress symptoms, above and beyond trauma exposure. It is notable that after the predictive ability of trauma exposure was taken into account, the organizational variables significantly contributed to the prediction of traumatic stress symptoms. These findings suggest that both the severity of trauma exposure as well as the organizational variables play significant roles in the prediction of traumatic stress symptoms. As explained by one participant, “there are different levels and different event types that cause stress. Some of them are incidents and others are institutional stress that occur as a result of a departmental policy or decision.” Accordingly, the findings suggest that the severity of trauma exposure as well as emergency service providers’ organizational climate and organizational commitment all warrant attention in future research and possibly, prevention and intervention efforts.
Moderating Relationships

Moderated multiple regression was employed to determine whether emergency service providers’ organizational climate might moderate the relationship between trauma exposure and traumatic stress symptoms as well as the relationship between trauma exposure and posttraumatic growth.

The results revealed that autonomy and workload moderated the relationship between overall trauma exposure and traumatic stress symptoms. Participants reported the greatest traumatic stress symptoms under conditions of less autonomy and more severe overall trauma. One emergency service provider addressed the issue of autonomy by explaining that the most stressful aspect of his/her job was the "inability to have input into daily operations. Decisions are made by persons furthest removed from the actual job. There is a culture of 'close enough' or 'don't make waves' which justifies [errors and oversights]." Another firefighter touched upon the issue of autonomy as he explained, "As a senior officer... I find looking after the safety of the front line... firefighters the most stressful aspect of the job. Often decisions are made without the complete facts being present." Furthermore, it is feasible that autonomy might function to combat feelings of helplessness and powerlessness that can be associated with traumatic events and might increase emergency service providers' sense of competency.

Workload functioned as a moderator of the relationship between index trauma and traumatic stress symptoms. Participants reported greater traumatic stress symptoms under conditions of more severe index trauma and greater workload rather than less severe index trauma and lighter workload. Numerous emergency service providers noted the duration of their shifts and the impact this has upon their stress at work, fatigue, and interpersonal relationships outside of work. Various other participants made reference to the "cumulative effects of the day to day grind of the job" and one explained, that stress is associated with "the amount of calls and the variety of calls that we attend. For the most part, it is pretty good but a bad call or a very busy day/night can be stressful." One possible explanation for the moderating role of workload is that decreased workload following traumatic events might provide a greater opportunity for emergency service providers to psychologically process the event, access social support, and focus on self-care (e.g., proper nutrition and sleep hygiene).

Perceived organizational support was found to moderate the relationship between trauma exposure and posttraumatic growth, indicating that emergency service
providers reported greater posttraumatic growth under conditions of high organizational support rather than low organizational support. Numerous participants commented on the detrimental impact of poor organizational support upon their well being. For example, one participant noted, “Overall the job is not that stressful. There are some scenarios (i.e., child abuse, death) that still disturb me. The biggest stress of my job is the lack of support from upper management in regards to personal issues.” Another stated, “Management doesn’t appreciate the sacrifice we make and the constant daily abuses of our collective agreement become disheartening over time. I have no loyalty to my department and given the opportunity to leave with my pension, I would.” Another participant poignantly indicated, “What I find stressful is the lack of respect we receive from the employer, the other aspects of the job are there when you sign on and you are aware there will be good days and bad days.” The impact of a lack of organizational support in the face of work-related injury was addressed by one participant who explained that what is most stressful is the "lack of respect from management for the job. Not being treated as part of the team, rather as a need for the team to function. Currently, going through a work related injury and they (management) treat you [badly]."

Mediating Relationships

Results from path analyses indicated that organizational support, team cohesion, workload, and affective commitment mediated the relationship between distress and traumatic stress symptoms. When participants were asked to explain what they found most stressful about their jobs and why, the vast majority of participants discussed stress associated with an unsupportive organization. As stated by one firefighter, “Most of the stress that I find from this job comes from my upper management… and my association. I don’t believe that they operate in the best interests of me or the citizens that I protect.” Another participant explained, “I took early retirement due to the way that senior management of [organization name] ignored my efforts to improve the workplace. Despite having the highest rating possible I felt that my efforts were totally ignored.” Another firefighter replied, “Support from my employer. My job is about taking risks. My employer's priority is risk management and the image of the company, not supporting its employees.” In explaining the stressful aspects of their jobs, numerous participants also touched upon the issue of team cohesion. One participant explained, “The most stressful thing about my job is witnessing and accepting the fact that people are selfish and cruel to each other. It has been a long time since I have seen an act of kindness from anyone but my coworkers.” Other participants identified concern for their coworkers as a source
of stress. As an example, one firefighter stated, "The possibility of making a mistake during a call is always present which could result in death or injury to a coworker or member of the public." Another firefighter poignantly explained, "I have been a firefighter for over 30 years. I have seen it all...Now I am in charge of [number] firefighters and the decision that I make can ‘kill’ people. Many of them...my friends. This is my new stress."

The remaining organizational variables did not function as mediators but instead, trauma exposure had a direct relationship with utilization of skills, role clarity, and normative commitment. Team cohesion, perceived organizational support, workload, affective commitment, and normative commitment mediated the relationship between trauma exposure and posttraumatic growth. However, the mediating pathways were fairly convoluted and functioned through traumatic stress, with the exception of perceived organizational support. Autonomy, normative commitment, and perceived organizational support had direct relationships with posttraumatic growth.

General Discussion: Traumatic Stress and the Organizational Climate

Previous evidence for the role of the organizational climate and organizational commitment in the development of psychological symptoms had been scant, with the exception of some noteworthy studies. For example, Allen (1995) found that among a sample of firefighters, the correlation between chronic occupational stressors and strain was stronger than the correlation between traumatic job events and strain. Regehr et al. (2004) sampled child welfare workers and found that organizational factors had a significant, direct effect on distress and also, organizational factors had the strongest association with distress when compared to individual and incident factors. Regehr (2003) found that paramedics' feelings of being unprotected, attacked, and presumed guilty of incompetence or negligence were intensified by an unsupportive organizational response. Results of the present study extended and clarified previous findings on the relationship between emergency service providers' organizational climate and psychological symptoms in the following ways. The present study measured a broader array of organizational climate variables, measured organizational commitment and traumatic stress symptoms, addressed more complex relationships among the variables (i.e., mediating and moderating pathways), and considered positive outcomes of trauma exposure (i.e., posttraumatic growth).

Overall, the findings from the present study indicated that emergency service providers' organizational climate and organizational commitment have the potential to impact the development of traumatic stress. However, the precise relationship between
the organizational climate, organizational commitment, and traumatic stress may be much more complex than has been recognized in previous research or than was initially hypothesized in the present study. The current study found that firefighters’ organizational climate and organizational commitment had direct, moderating, and mediating relationships with traumatic stress as well as some non-significant relationships. Interestingly, more detailed inspection of the results revealed additional nuances. For example, team cohesion was found to be involved in two mediating pathways. Greater trauma exposure was associated with greater team cohesion, which was associated with decreased traumatic stress symptoms. However, team cohesion decreased in the presence of distress, which was associated with increased traumatic stress symptoms. Accordingly, the severity of firefighters’ traumatic stress symptoms seemed to hinge on the degree of distress that they experienced and the subsequent impact on team cohesion. Yet another example of a nuanced relationship in the current study was the finding that firefighters’ workload functioned as a moderator in the case of index trauma; however, workload functioned as a mediator in the case of overall trauma exposure.

Low-alternative commitment was correlated with traumatic stress symptoms and absenteeism categorized as work-related injury. However, it is notable that high sacrifice and low-alternative commitment were not involved in mediating or moderating the relationships between trauma exposure, distress, and traumatic stress symptoms, which was inconsistent with the hypotheses. Although the non-significant findings might have been accounted for by restriction of range, descriptive analyses do not support this explanation. It is more likely that people who are concerned about job-related sacrifices would select an entirely different career, given the inherent risks associated with the emergency services (e.g., risk of injury, costs associated with shift work, lack of employment longevity as a frontline worker). It is also likely that persons who are concerned with employment alternatives might venture into a more secure avenue of employment compared to the emergency services, given the risks associated with this field of work but also given the limited opportunities for horizontal and vertical movement within emergency service organizations. Furthermore, the skills learned through firefighting, for example, would be expected to translate to an array of career choices that pertain to firefighting (e.g., fire prevention, search and rescue, firefighting equipment manufacturing) as well as other avenues of employment (e.g., mechanics, fund raising, personal training).
Although the present study was not designed to explicitly test the various stress theories, the results from the present study shed some light in this regard. The General Adaptation Syndrome proposed that the stress response is exacerbated by increased duration, severity, or quantity of stressors. This theory exclusively addressed biochemical and physiological responses to stress; however, results from the present study suggest that the General Adaptation Syndrome might also apply to psychological stressors and symptoms. Results from the present study indicated that in the presence of traumatic events, added organizational stress (i.e., lack of autonomy or heavy workload) compounds the initial stress response, thereby resulting in increased traumatic stress symptoms.

The Cognitive-Transactional Model articulated that in order for an event to function as a stressor, it must be perceived as such by the individual in question. This model helps to account for discrepancies among those events that would be considered as traumatic in the general population compared to those events that are identified as traumatic or highly upsetting by emergency service providers. For example, Regehr and Bober (2005) noted that emergency service providers also identify traumatic events as including low-profile events that connect with them on a highly personal level, such as the despair of a suicide victim. Similarly, those events that were described as the most traumatic by emergency service providers in the present study included events such as the death of a child, contact with infectious body fluids, and injured/ill children whereas multiple casualties and prolonged resuscitation were identified as relatively less distressing. Furthermore, the Cognitive-Transactional Model indicated that cognitive appraisals mediate the relationship between stressors and psychological symptoms. Although appraisals were not directly measured in this study, processes that would be expected to facilitate positive or less threatening appraisals (e.g., team cohesion, organizational support, affective commitment) mediated the relationship between trauma exposure and traumatic stress.

When the results of the present study are considered as a whole, the greatest support was provided for the Conservation of Resources Theory. The threat of possible loss in resources and actual loss of resources helps to explain why various organizational stressors (e.g., workload and autonomy) exacerbated the stress response. Hobfoll also proposed that failure to obtain expected resources (e.g., camaraderie and support) would intensify the stress response. Similarly, results from the present study revealed that reductions in positive aspects of the organizational climate
(e.g., team cohesion and organizational support) were directly or indirectly related to greater traumatic stress. It is also important to note that the Conservation of Resources Theory proposes that resource gain offsets the impact of resource loss. Similarly, findings from the present study indicated that resource gain (e.g., increased organizational support) was associated with decreased traumatic stress symptoms and increased posttraumatic growth. In summation, the Conservation of Resources Theory seems to best capture the results of the present study by addressing the detrimental impact of added stressors while acknowledging the protective role of increased resources (e.g., social support).

General Discussion: Posttraumatic Growth and the Organizational Climate

Consistent with findings from previous research, greater trauma exposure was associated with greater posttraumatic growth. Although the direction of this relationship might seem counterintuitive, the experience of a highly stressful or traumatic event is a necessary precondition for growth (Tedeschi & Calhoun, 1995) and as with any highly stressful event, associated traumatic stress symptoms would be expected. Similarly, Butler et al. (2005) found that posttraumatic growth increased as PTSD symptoms increased. However, Butler found that the positive relationship between PTSD and posttraumatic growth held only up to a point, which was roughly at the measure’s cut-off score for probable PTSD diagnosis. After that point, increasing PTSD symptoms were associated with a decline in reported growth. Similarly, Lechner, Carver, Antoni, Weaver, and Phillips (2006) found that a curvilinear function better characterized some of the growth-outcome relationships.

Although the present study found a positive, linear relationship between traumatic stress symptoms and posttraumatic growth, these findings are not inconsistent with the existing research when the characteristics of the present sample are considered. The firefighters in the current study represented a relatively high functioning sample of firefighters (i.e., the vast majority were currently employed in full time, regular duties and reported subclinical levels of traumatic stress symptoms). Accordingly, the present sample reflects the first half of the curvilinear relationship (i.e., the positive, linear relationship). In the event that a more severely impaired sample of firefighters had been included, it is quite feasible that a curvilinear relationship between traumatic stress symptoms and posttraumatic growth might have been found. As such, the determination of whether a curvilinear relationship exists among firefighters is one possible avenue for future research.
Contrary to the hypotheses, findings from the present study did not provide strong evidence to suggest that the organizational climate plays an important role in the development of posttraumatic growth, other than perceived organizational support, team cohesion, and affective commitment. Tedeschi and Calhoun (2004, p. 5) explained that “growth...does not occur as a direct result of trauma. It is the individual’s struggle with the new reality in the aftermath of the trauma that is crucial in determining the extent to which PTG occurs.” Accordingly, posttraumatic growth might be influenced by characteristics of traumatic events (e.g., age of the victims, degree of violence) or various other variables, rather than the organizational climate. Furthermore, the organizational climate might not factor into emergency service providers’ “struggle” to understand traumatic events, given that emergency service organizations have no role in the types of traumatic events that occur (with the exception of firefighters who are injured as a result of organizational or coworker negligence). In support of this possibility, participants readily described frustrations with their organizations but tended not to mention their organization when describing the traumatic events that they encountered or when explaining their understanding of those traumatic events. As an example, one participant explained, “innocent victims of illness or accident, children as victims, the constant reminder of how easy our lives can change and the fact that we take so so much for granted. The world is getting uglier or I am.” Other participants shared comments such as the following. “The pain inflicted upon humans by humans is devastating. Seeing poverty stricken people and how they live and seeing lonely elderly people haunt me.” “The prevalence of violence towards our fellow man still blows me away.” “The way old people die. Nothing peaceful about it most times...looks like suffering to me.”

It is also feasible that firefighters’ struggle to understand traumatic events might also include personality features, coping resources, and appraisals that are related to their unique life situations and stressors. For example, a participant explained, “I chose this profession because I want to help people. I did not injure them or tell them to commit suicide so I do not feel remorseful. I am here to stabilize the situation or make it better.” Another participant wrote, “although I have come up against a number of what should or could be very stressful situations...I somehow find that these situations have little effect on me because of the understanding that I’m just doing my job.” In further support of this possible explanation, variables that were more reflective of one’s internal experience (i.e., affective and normative commitment) were found to be significantly related to
posttraumatic growth, whereas variables representing one's organizational climate that are unrelated to the acquisition of experiential meaning (e.g., workload) were not significantly related to posttraumatic growth. As such, it is possible that factors such as personality styles, appraisals, and coping resources might serve a larger role in the development of posttraumatic growth than the organizational climate. However, since these variables were not included in the current study, this comment represents a tentative hypothesis.

Much controversy over the construct, posttraumatic growth, arose after the development of the present study. The controversy arose following research by Hobfoll and colleagues, who found that posttraumatic growth was predictive of later debilitating, chronic psychological impairment (i.e., PTSD) and was related to greater distress, right-wing political attitudes, and support for retaliatory violence (Hobfoll, Hall, Canetti-Nisim, Galea, Johnson, & Palmieri, 2007). Hobfoll's sample included Israeli Jewish and Arab civilians living amidst the Al Aqsa Intifada (2000-2004), which involved an onslaught of violence and terrorism. Initially, the authors concluded that posttraumatic growth was not a positive outcome of trauma exposure but rather, was a transient means of coping with distress and was actually a "sign of worse to come" (Hobfoll, Kaniasty, Satttler, & Butler, 2005, p.44). Since the release of these findings, various noteworthy opinions and findings have come to light.

Butler (2007) noted that Hobfoll's participants consisted of civilians residing amidst a war zone; a sample that differs dramatically from other research on posttraumatic growth. Butler concluded that the generalizability of Hobfoll's findings should be approached with caution. Similar to Butler's observation, the sample in the present study is notably different than Hobfoll's sample. Although emergency service providers commonly witness people who are faced with imminent or perceived life threat, it is much less common for emergency service providers to directly experience imminent or perceived life threat to their own lives. Furthermore, emergency service providers tend not to perceive routine calls as life threatening, as evidenced by the participants' relatively mild to moderate distress ratings of potentially traumatic events that they routinely encounter (see pg. 69). Other differences among the samples include the training and equipment that emergency service providers receive along with the relatively high functioning of the sample in the present study. Furthermore, Hobfoll's sample consisted of civilians living amidst an active war zone and as such, the trauma exposure was ongoing at the time that Hobfoll conducted his studies. This differs
markedly from the ongoing trauma exposure experienced by emergency service providers, who have some respite from traumatic events when they are not on duty. These differences suggest that there is reasonable basis to assume that Hobfoll's findings might not generalize to the present sample.

An important implication of Hobfoll's research is that by the very nature of his sample, he was actually measuring peritraumatic growth, rather than posttraumatic growth. Butler explained that the timing of measurement might account for the negative consequences of posttraumatic growth that were reported by Hobfoll and colleagues, as follows.

The reporting of benefits or gains or growth that represent actual beneficial changes or psychological thriving are...more likely to be reported in hindsight - when one reflects back (or is asked to reflect back) upon the experience - because they are a product of coping and other efforts over time to come to terms with what has happened (Butler, 2007, p. 370).

Similar to Butler's comments, a meta-analysis conducted by Helgeson et al. (2006) revealed that the time since the traumatic event functioned as a moderator, such that benefit-finding or growth was more likely to be related to positive psychological outcomes as the time since the event increased. Consistent with the conclusions of Butler, Helgeson et al., as well as the initial conceptualizations of posttraumatic growth (i.e., Tedechi and Calhoun, 2005), the duration since the emergency service providers' most recent traumatic event exceeded one month, with the exception of nine cases. Furthermore, emergency service providers in the present study were asked to reflect back upon their experiences, suggesting that their responses to the Posttraumatic Growth Inventory likely reflected their efforts over time to come to terms with the trauma that they experienced and hence, actual beneficial changes or psychological thriving, rather than transient efforts at coping during peritraumatic exposure (as in the case of Hobfoll's sample).

Hobfoll and colleagues later hypothesized that under certain conditions, posttraumatic growth would be a bonafide positive indicator. Specifically, the authors hypothesized that those participants who reported posttraumatic growth and took action that "represent[ed] their traumatic growth in facing their traumatic circumstances would be less likely to develop PTSD and depression than those who did not derive growth from their experience"(Hobfoll et al., 2007, p. 356). Consistent with their hypotheses, it was found that posttraumatic growth functioned as a protective factor against the
development of PTSD (but not depression) among individuals who took part in the resistance to the evacuation from Israel. Interestingly, the presence of posttraumatic growth under these conditions reduced the odds of a PTSD diagnosis by an astonishing 63 percent. Although "action growth" was not directly measured in the present study, the significant relationship between trauma exposure and greater utilization of skills suggests that the emergency service providers in the current study were engaged in action in response to the traumatic events that they encountered. It is feasible that utilization of skills during a traumatic event pertains to at least one component of posttraumatic growth (i.e., sense of personal strength); however, it remains unclear to what extent the emergency service providers might have perceived their actions as having been meaningful. One emergency service provider explained, "One of the most stressful aspects of my job is to standby and to await aid from others because the organization does not allow you to use skills that they have provided you with." This comment suggests that perhaps the inability to take action might shift the focus from obtaining meaning from the event to focusing on organizational stress. Unfortunately, this represents a tentative hypothesis at best as the precise role and purpose of "action growth" is an area in much need of further research.

Some compelling evidence for the positive implications of posttraumatic growth has accumulated through meta-analytic and longitudinal research. A meta-analysis by Helgeson et al. (2006) found that posttraumatic growth was related to less depressive symptoms, but greater avoidance and intrusive thoughts. A longitudinal study by McMillen, Smith, and Fisher (1997) found that initial posttraumatic growth predicted fewer PTSD symptoms at their later assessment. In particular, benefit was noted for those with more severe disaster exposure.

Based on the current state of the literature on posttraumatic growth, researchers have not reached a consensus as to precise role or purpose of posttraumatic growth. However, the current state of the research seems to be more optimistic than Hobfoll initially cautioned and the precise implications of posttraumatic growth (i.e., whether it is a bonafide positive outcome or merely an indicator of future psychopathology) seem to hinge on the point at which posttraumatic growth is measured. According to Butler (2007, p. 370), "assessments conducted early in trajectories of adaptation -- such as those reported in the Hobfoll studies -- would be more likely to tap active coping efforts (adaptive or otherwise) and acute distress management" whereas "the reporting of benefits or gains or growth that represent actual beneficial changes or psychological
thriving are...more likely to be reported in hindsight.” Although there is sufficient basis to
assume that the current study measured actual beneficial changes or psychological
thriving, the implications of the results pertaining to posttraumatic growth ought to be
approached cautiously given the ongoing debate in the literature.

**Methodological Limitations and Recommendations for Future Research**

The focus of the present study was in identifying the means through which
emergency service providers' organizational climate and organizational commitment
might mediate or moderate the relationship between trauma exposure and posttraumatic
growth. Accordingly, the role of each organizational climate and organizational
commitment variable was examined in isolation rather than including all variables within
a single model. This approach directly addressed each hypothesis with clarity and
simplicity and was appropriate given the state of the research in merging the traumatic
stress and organizational psychology literature. Nonetheless, subsequent research
should move towards an inclusive model that integrates all organizational variables
within a single structural equation model.

In the path models employed in the present study, distress was conceptualized
as impacting perceptions of the organizational climate and organizational commitment,
rather than the organizational climate or organizational commitment influencing distress.
Accordingly, another fruitful avenue for future research would be to ascertain whether
distress might also impact the organizational climate and organizational commitment and
whether any reciprocal pathways between these variables might exist. Although the path
models employed in the present study could be altered to create a nonrecursive model
by adding a bidirectional pathway and another exogenous variable (for model
identification purposes), the greater obstacle would be the preliminary state of the
research and the lack of specificity in existing theories to form the basis of more complex
structural equation models.

Furthermore, the conclusions that can be drawn from the present study are
limited by the retrospective design of the study. This limits conclusions that can be
drawn about causality as well as the temporal sequence between the variables. This
also raises caution given that retrospective accounts may be subject to rater drift and
other problems associated with retrospective recall (e.g., Brewin, Andrews, & Gotlib,
1993). Replication of the findings through a longitudinal study along with time series
analysis would provide greater confidence in the results and importantly, would allow for
conclusions to be drawn about the temporal sequence of events.
Another limitation concerns the generalizability of the results. The sample employed in the present study was a sample of Canadian emergency service providers (predominantly firefighters) who self-selected to participate in the study. The sample was relatively high functioning, as it consisted primarily of emergency service providers who were employed in full-time, regular duties and who experienced minimal to moderate traumatic stress symptoms. It remains unclear to what extent these findings would be expected to generalize to an exclusive sample of firefighters, more severely impaired firefighters, or other types of emergency service providers (e.g., paramedics or police officers). Other avenues of inquiry might include comparisons between different types of emergency service providers, emergency service providers in urban versus rural settings, male versus female emergency service providers, years of service, paid versus volunteer emergency service providers, and Canadian emergency service providers versus emergency service providers from other countries.

The inclusion of measures of more general psychopathology and personality would likely be of assistance in disentangling those factors that impact the relationship between traumatic stress, organizational climate, organizational commitment, traumatic stress, and posttraumatic growth. Furthermore, our understanding of those factors that impact posttraumatic growth would likely be facilitated by the direct measurement of the meaningfulness of emergency service providers' actions amidst emergencies, other opportunities for meaningful action (e.g., opportunities for community outreach or special programming), and some indication of participants' depth of experiencing (e.g., Klein, Mathieu-Coughlan, & Kiesler, 1986). This information would also provide an opportunity to formally evaluate Hobfoll's most recent hypotheses pertaining to the situations under which posttraumatic growth is associated with bonafide positive outcomes.

Extensions of the present study should explore the impact of the organizational climate and organizational commitment upon symptoms of burnout and depression, given the high comorbidity between these symptoms and traumatic stress. Another avenue for future research includes the comparison of social support within and outside the workplace to ascertain whether the relationship between perceived organizational support and posttraumatic sequelae varies as a function of social support outside the workplace. A measurement challenge for future research in this area will be to capture fluctuations in the organizational climate in order to ascertain whether stability in the organizational climate incurs benefits above and beyond a positive organizational climate. Finally, a fruitful avenue for future scholarly debate and research is to entertain...
the potential evolutionary value of posttraumatic stress symptoms among emergency service providers, given the relatively mild to moderate symptoms reported by emergency service providers compared to trauma victims in the general population (e.g., Figley, 1995).

**Implications and Conclusions**

**Implications for the Academic Community.** Results from the present study implicated the role of the organizational climate and participants' commitment to their organization in the development of traumatic stress and posttraumatic growth. These findings suggest that future stress theories and future research aimed at understanding the experiences of emergency service providers ought to inclusively address trauma exposure, the organizational climate, organizational commitment, and traumatic stress. Importantly, the present study found that the organizational variables as whole predicted traumatic stress symptoms above and beyond the characteristics of trauma exposure. The characteristics of trauma exposure predicted traumatic stress symptoms above and beyond the organizational variables. Accordingly, any one of these factors does not supersede the importance or necessity of attending to the remaining factors. A more comprehensive understanding of the development of traumatic stress among emergency service providers is gleaned from the interaction of trauma exposure, the organizational climate, organizational commitment, and traumatic stress. Furthermore, many of these variables were related to posttraumatic growth, arguing that future research should strive to achieve a more balanced understanding of the impact of trauma exposure by addressing negative outcomes (i.e., traumatic stress) in addition to positive outcomes (i.e., posttraumatic growth) following trauma exposure.

Various authors (e.g., Regehr & Bober, 2005) have noted that emergency service providers readily identify those events that would be considered traumatic by most persons in the general population. However, they tend to identify the most upsetting events as including low-profile events that connect with them on a highly personal level. Consistent with these reports, the present study revealed that trauma exposure was indirectly related to traumatic stress symptoms. Greater trauma exposure was associated with greater distress and in turn, greater distress was directly related to greater traumatic stress symptoms. In other words, emergency service providers' subjective interpretation of the events rather than the events themselves was directly related to traumatic stress symptoms. This finding suggests that the academic community should measure the perceived severity of potentially traumatic events in
addition to some measure of how upsetting or distressing those events had been. Furthermore, similar as well as different patterns of results were obtained when the severity and distress associated with overall trauma were compared to the severity and distress associated with index trauma. Although there was some redundancy in measuring overall and index trauma, important differences emerged for certain variables. As an example, team cohesion functioned as a mediator of the relationship between trauma exposure, traumatic stress, and posttraumatic growth when overall trauma was considered. However, team cohesion had a direct relationship with traumatic stress symptoms when index trauma was considered. These findings suggest that both overall trauma exposure and index trauma should be measured in order to thoroughly elucidate nuances in the development of traumatic stress and posttraumatic growth among emergency service providers.

Implications for Emergency Service Providers. Results from the present study revealed that the development of traumatic stress among emergency service providers is much more complex than was hypothesized in the present study or described in previous research. The results suggest that overall trauma exposure, index trauma, and distress are involved in the development of traumatic stress. Above and beyond these findings, the organizational climate as well as emergency service providers’ internal attachment to their organization (i.e., organizational commitment) was also related to traumatic stress symptoms. Accordingly, the development of traumatic stress among emergency service providers seems to involve a complex interplay between these factors.

The results also revealed that trauma exposure did not exclusively produce profoundly detrimental outcomes. Instead, the vast majority of the sample reported subclinical levels of traumatic stress and continued to work in a full time capacity. However, this finding does not trump the possibility that subclinical levels of traumatic stress may have a negative impact on psychosocial functioning (e.g., interpersonal relationships). Importantly, participants in the present study reported a balanced experience of trauma that included negative outcomes (i.e., traumatic stress) as well as positive outcomes (i.e., posttraumatic growth). The traumatic events that they experienced were associated with various indices of posttraumatic growth, such as greater appreciation for life, positive changes in interpersonal relationships, and increased sense of personal strength. Accordingly, emergency service providers reported some level of personal meaning associated with the traumatic events they encountered.
The role of team cohesion and distress in the development of traumatic stress and/or posttraumatic growth suggests that interventions addressing these factors have the potential to decrease traumatic stress symptoms and increase posttraumatic growth. This provides a mechanism through which emergency service providers can directly promote resiliency in themselves as well as their coworkers, regardless of the presence or absence of formal organizationally-based interventions. Given that emergency service providers spend the vast majority of their time with fellow crew members rather than management, front line emergency service providers are perhaps in the best position to monitor the psychological needs of their fellow front line workers. The ability to facilitate an environment of team cohesion and low perceived threat in response to traumatic events would equip frontline workers with a means of protecting themselves and their peers from the detrimental impact of trauma.

Implications for Interventions. The identification of specific aspects of the organizational climate or organizational commitment that prevent or engender the development of traumatic stress and posttraumatic growth provides some basis to formulate possible preventative interventions. However, these recommendations should be approached with caution in the absence of research regarding their efficacy.

Fruitful avenues for prevention as well as post-trauma intervention might include efforts directed towards facilitating a supportive environment for emergency service providers, which includes support from the organization and peer levels. Other options might include reductions in workload following critical incidents, increased autonomy in the workplace, efforts to facilitate emergency service providers’ affective and normative commitment, and surveys to monitor the organizational environment. Such interventions have the potential to reduce traumatic stress symptoms while facilitating posttraumatic growth through a preventative and/or post-trauma framework.

The present study found that the magnitude of distress that emergency service providers experience plays a pivotal role in determining the degree of team cohesion and thereby, the severity of traumatic stress symptoms. Given that the causal relationship between these variables is unclear, it is possible that distressed emergency service providers might withdraw from their colleagues. It is also possible that emergency service providers might experience difficulty understanding or helping a colleague who is distressed and thereby, might distance themselves from the distressed colleague. These findings suggest that preventative and post-trauma interventions might address emergency service providers’ personal experience of distress as well as the
manner in which emergency service providers respond to the distress of a fellow colleague. Preventative efforts might include efforts to destigmatize distress and disseminate information via psychoeducation regarding the signs of distress, the role of distress and its potential negative impact on team cohesion, resources that are available to distressed emergency service providers, and specific strategies for helping a distressed colleague. Organizations might also target distress on an individual basis through supportive or other psychological interventions following traumatic events.

Perceived organizational support was consistently related to decreased traumatic stress and increased posttraumatic growth. Furthermore, it was found that perceived organizational support mediated and moderated the impact of trauma exposure upon traumatic stress and posttraumatic growth. This finding suggests that organizationally-based interventions geared towards creating a more supportive organizational climate would be expected to benefit emergency service providers when faced with traumatic events. The findings also suggest that organizationally-based interventions aimed at facilitating emergency service providers’ affective and normative commitment would also be expected to be associated with reductions in traumatic stress symptoms and increases in posttraumatic growth. Overall, the findings of the present study emphasize that interventions have the potential not only to decrease negative outcomes following trauma-exposure, but also to increase posttraumatic growth and promote resiliency.

Implications for Emergency Service Organizations. Whereas the impetus for addressing traumatic stress in a preventative fashion would be to maintain the psychological well-being of emergency service providers, it is unclear to what extent such efforts might benefit emergency service organizations. It is reasonable to expect that in order for organizations to make preventative efforts commonplace, there needs to be some incentive for organizations and their bottom line. Previous research has demonstrated that traumatic stress has been related to leaves of absence, job ineffectiveness, and compromised job safety (Shalev & Yehuda, 1998) and that stress has been more costly for organizations compared to work-related accidents as measured by health care costs, absenteeism, and lost productivity (Schultz & Schultz, 1998). Consistent with these findings, results from the present study indicated that traumatic stress was associated with increased absenteeism, as classified by days off work because of illness, work-related injury, and mental health reasons. Furthermore, traumatic stress was associated with emergency service providers’ decreased commitment to their organization and decreased team cohesion. Decreased
commitment and cohesion have the potential to create an array of problems in the workplace, such as decreased compliance, interpersonal discord, and organizational effectiveness; none of which is a minor point with respect to public safety. Although the causal direction of these relationships is unclear, these results provide some incentive for emergency service organizations to begin to entertain efforts to address traumatic stress in a preventative fashion by attending to trauma exposure, psychological symptoms, the organizational climate, and employees’ commitment to the organization.
REFERENCES


Beaton, R., & Murphy, S. A. (1993). Sources of occupational stress among firefighters/EMTs and firefighter/paramedics and correlations with job-related outcomes. Prehospital and Disaster Medicine, 8, 140-150.


McFarlane, A. (1988b). Relationship between psychiatric impairment and a natural disaster. The role of distress. Psychological Medicine, 18, 129-139.


Monnier, J., Cameron, R. P., Hobfoll, S. E., & Gribble, J. R. (2002). The impact of resource loss and critical incidents on psychological functioning in fire-


Appendix A: Glossary of Terms

Absenteeism: Absence from work. In the present study, absenteeism operationalized as participants' self-reported days of work as classified by vacation time, sick days, work-related injury, mental health, and other.

Acute Stress Disorder (ASD): ASD pertains to traumatic stress symptoms that occur between 24 hours and one month following trauma exposure and result in psychosocial impairment. The DSM-IV-TR criteria for ASD are listed on page 8.

Affective commitment: Affective commitment refers to the degree to which an employee identifies with an organization, internalizes its values and attitudes, and complies with its demands (Schultz & Schultz, 1998).

Autonomy: Having input into the nature of one's own routine job duties.

Burnout: This term has been used to describe a state of physical, emotional, and mental exhaustion resulting from long term involvement in emotionally demanding situations (Pines & Aronson, 1988).

Compassion Fatigue: Compassion fatigue refers to the tendency for individuals in helping professions (e.g., therapists, social workers, emergency service providers) to become upset or traumatized as a result of helping or wanting to help a traumatized or suffering person or of knowing about a traumatizing event experienced by a significant other (Figley, 1995).

Complex Posttraumatic Stress Disorder (CPTSD): A term used to describe a complex form of posttraumatic disorder in survivors of prolonged, repeated trauma (Herman, 1997; Herman, 1995). CPTSD is characterized by alterations in affect regulation, consciousness, self-perception, perceptions of the perpetrator, relations with others, and systems of meaning. CPTSD is not recognized as a formal diagnosis but is described in the associated features section of PTSD in the DSM-IV-TR.

Direct trauma exposure: When emergency service providers experience the trauma themselves (e.g., becoming the victim of violence while on the job).

Disorders of Extreme Stress not Otherwise Specified (DESNOS): A term used to describe a complex form of posttraumatic disorder in survivors of prolonged, repeated trauma (Herman, 1997; Herman, 1995). DESNOS is characterized by alterations in affect regulation, consciousness, self-perception, perceptions of the perpetrator, relations with others, and systems of meaning. DESNOS is not recognized as a formal diagnosis but is described in the associated features section of PTSD in the DSM-IV-TR.

Distress associated with trauma exposure: Participants were asked to appraise the distress associated with their overall trauma exposure and index trauma (0 = not at all distressing, 100 = very distressing).
Emergency service providers: Front line emergency service personnel. Examples include but are not limited to firefighters, paramedics or emergency medical technicians, police officers, and victim service responders.

Hierarchical multiple regression: A statistical technique for assessing the relationship between one dependent variable and several independent variables. The independent variables enter into the regression equation in an order specified by the researcher (Tabachnick & Fidell, 2001).

High sacrifice commitment: This term refers to a sense of commitment to one’s organization because of the perceived sacrifice associated with leaving an organization.

Index trauma: In the present study, index trauma was defined as the most recent traumatic event that the participants experienced.

Low alternative commitment: This term refers to a sense of commitment to one’s organization because of a lack of employment alternatives.

Mediator variable: "A given variable may be said to function as a mediator to the extent that it accounts for the relation between the predictor and the criterion. Mediators explain how external physical events take on internal psychological significance. Whereas moderator variables specify when certain effects will hold, mediators speak to how or why such effects occur" (Baron & Kenny, 1986, p. 1176).

Moderated multiple regression: An extension of multiple regression, in which interactions between predictor variables can be included in the regression equation.

Moderator variable: "A moderator is a qualitative ... or quantitative ... variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable. Specifically within a correlational analysis framework, a moderator is a third variable that affects the zero-order correlation between two other variables. ... In the more familiar analysis of variance ... terms, a basic moderator effect can be represented as an interaction between a focal independent variable and a factor that specifies the appropriate conditions for its operation" (Baron & Kenny, 1986, p. 1174).

Normative commitment: Normative commitment refers to a sense of obligation to remain with the organization (Spector, 2000).

Organizational climate: A term used in the present document to collectively refer to organizational stress, perceived organizational support, and perceived team cohesion.

Organizational commitment: Organizational commitment refers to the degree and type of psychological identification with an organization (Greenberg et al., 2000). Organizational commitment includes acceptance of the values and goals of the organization, willingness to exert effort for the organization, and having a strong desire to remain affiliated with the organization (Mowday, Porter, & Steers, 1982; Mowday, Steers, & Porter, 1979).
Organizational stress: Organizational stress refers to those aspects of employees' jobs or organization that can lead to adverse physical and psychological reactions (Byron & Peterson, 2002; Greenberg et al., 2000). Organizational stress can include small daily hassles, chronic stressors, major work-related events, or large-scale events (Allen, 1995). In the present study, organizational stress was operationalized to include heavy workload and lack of autonomy, role clarity, and utilization of skills.

Organizational variables: A term used in the present document to collectively refer to organizational commitment along with those variables representing the organizational climate (i.e., organizational stress, perceived organizational support, and team cohesion).

Overall trauma: In general, the traumatic events that the participants experienced throughout their employment as an emergency service provider.

Path analysis: One type of analysis within the structural equation modelling family, in which there is only a single measure of each theoretical variable and the researcher has prior hypotheses about the relationships between the variables (Kline, 2005).

Perceived organizational support: Perceived organizational support refers to the degree to which an employee feels supported by his/her organization.

Posttraumatic growth: Positive change or a sense of personal growth following traumatic events. Examples of posttraumatic growth include positive changes in relating to others, new possibilities in life, a sense of increased personal strength, spiritual change, and greater appreciation of life (Tedeschi & Calhoun, 1996).

Posttraumatic Stress Disorder (PTSD): PTSD pertains to traumatic stress symptoms that occur at least one month after trauma exposure and result in psychosocial impairment. The DSM-IV-TR diagnostic criteria for PTSD are listed on page 8.

Role clarity: The extent to which an employee is clear about his/her job responsibilities.

Secondary trauma exposure: Secondary exposure refers to helping or wanting to help a traumatized or suffering person who has experienced an event outside the range of usual human experiences that would be markedly distressing to almost anyone (Morrissette, 2004). The event might be a serious threat to a traumatized person or sudden destruction to a traumatized person's environment (Morrissette, 2004).

Secondary Traumatic Stress Disorder: Figley (1995) coined the term, Secondary Traumatic Stress Disorder, to describe the psychological consequences of compassion fatigue. Secondary Traumatic Stress Disorder is similar to PTSD, except the symptoms result from knowledge about a traumatizing event experienced by a significant other and the symptoms are directly connected to the significant other (Figley, 1995).
Severity of trauma exposure: Participants were asked to appraise the severity of their overall trauma exposure and index trauma (0 = not at all traumatic, 100 = very traumatic).

Strain: Deviations from normal states of functioning that result from stress, such as physical symptoms (e.g., stomach pain), psychological symptoms (e.g., hyperarousal), and behaviours (e.g., absenteeism, lowered productivity; Greenberg et al., 2000).

Stress: The pattern of emotional, physiological, or cognitive reactions occurring in response to stressors (Greenberg et al., 2000).

Stressor: Factors in the external environment that induce stress among people exposed to them (Greenberg, Baron, Sales, & Owen, 2000).

Team cohesion: Carron, Brawley, and Widmeyer (1998, p. 213) defined team cohesion as "a dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs."

Traumatic events: A term used to refer to those events that are potentially traumatic and are likely to be perceived as traumatic by most people (Herman, 1997). The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000) proposes that such events involve actual or threatened death or physical injury, or threat to the bodily integrity of oneself or other people.

Traumatic stress: This term has been used throughout the literature to refer to the psychological strains that can result from trauma exposure. In the present document, this term encapsulates the symptoms of Posttraumatic Stress Disorder, Acute Stress Disorder, Secondary Traumatic Stress Disorder, Compassion Fatigue, Complex Posttraumatic Stress Disorder, and Disorders of Extreme Stress not Otherwise Specified (e.g., van der Kolk, McFarlane, & Weisaeth, 1996).

Utilization of skills: The extent to which employees feel that they have an opportunity to use the skills that they acquired through education or other training.

Vicarious trauma exposure: Vicarious exposure entails learning about a traumatic event that was experienced by another person (Figley, 1989). Vicarious exposure can include graphic descriptions of violent events, discussion of sights and smells, and exposure to the realities of people's cruelty to one another (Pearlman & Saakvitne, 1995).

Workload: Employees' perceptions of the amount of work that is assigned to them or expected of them.
### Appendix B: Summary of Stress Theories and Relevance to the Present Study

<table>
<thead>
<tr>
<th>Theory</th>
<th>Author</th>
<th>Basic Premise</th>
<th>Implications and Relevance to Hypotheses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biological Models</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| General Adaptation Syndrome     | Selye                | - Exclusively addresses biochemical and physiological responses to stress.  
- Each stressor has the same biological impact.  
- 3 stage model of stress: (1) alarm and mobilization, (2) resistance, and (3) exhaustion.  
- Exacerbated by increased duration, severity, or quantity of stress.                                                                                                                   | Implies that additional stressors will have a moderating effect on the stress response.                                                                                                     |
| **General Life Models**                                                   |                      |                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                 |
| Cognitive-Transactional Model   | Lazarus and Folkman  | - In order for an event to function as a stressor, it must be perceived as such by the individual.  
- Primary appraisals include harm-loss, threat, and challenge appraisals.  
- Secondary appraisals determine available coping options and the potential to cope successfully.  
- Together, primary and secondary appraisals determine whether an event is perceived as irrelevant, benign-positive, or stressful.                                               | The authors indicate that appraisals mediate the relationship between person and environment variables.                                                                                  |
| Conflict-Theory Model           | Janis                | - People can tolerate stress better if they are provided with realistic warning and preparations about the impending stressor.                                                                                                                                                                                                   | Not directly applicable to the hypotheses in the current study.                                                                                                                              |
| Conservation of Resources Theory | Hobfoll             | - Stress results from the threat of a possible loss in resources, failure to obtain expected resources, actual loss of resources, or lack of resource gain following investment of resources.                                                                                                               | Implies that added resource loss would moderate the impact of previous resource loss. The author proposes that resource gain (e.g., support) counters the negative impact of resource loss. |

*Continued on next page*
### Job-Related Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Author(s)</th>
<th>Description</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person-Environment Fit Model</td>
<td>Various authors</td>
<td>- Stress is viewed as a lack of correspondence between the person and the environment.</td>
<td>Difficult to apply to the present study, given that the authors do not articulate specific work characteristics that might produce strain.</td>
</tr>
</tbody>
</table>
| Job Demands Job Decision Latitude Model    | Karasek   | - Psychological strain develops from the joint effects of job demands and decision latitude.  
   - Proposes that strain would be the greatest when job demands are high and decision latitude is low. | Implies that lack of autonomy would exacerbate responses to workplace trauma. |
| Process Model of Task Performance          | McGrath   | - Task performance is a function of perceived stress and actual task ability and difficulty.  
   - Perceived stress is determined by the perceived importance of the task and the perceived ability to perform the task. | Not directly applicable to the hypotheses in the current study. |
| Integrative Transactional Process Model    | Schuler   | - Incorporates environmental stressors, time, individuals' perceptions, individual characteristics, the stress response, and stress outcomes. | This model has been criticized because it fails to provide enough specificity to allow researchers to general concrete hypotheses (Sulsky & Smith, 2005). |

### Stressor and Response-Specific Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Author(s)</th>
<th>Description</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stressor and Response-Specific Models</td>
<td>Various</td>
<td>- Various models have been proposed throughout the literature that focus on particular stressors, groups of stressors, select responses, or specific populations.</td>
<td>Models that directly address the hypotheses of the current study do not appear to have been developed.</td>
</tr>
</tbody>
</table>
Appendix C: Unpublished Questionnaires

Throughout the course of your job, have you experienced an event that you considered to be traumatic?
- Yes
- No

Please indicate your response to the following question by moving the star along the line:
**OVERALL,** the events that I experience through my job are:

- Not at all traumatic
- Very traumatic

- Not at all distressing
- Very distressing

Please indicate your response to the following question by moving the star along the line:
The **MOST** traumatic event that I experienced through my job was:

- Not at all traumatic
- Very traumatic

- Not at all distressing
- Very distressing

Please use the keyboard to type your responses to the following two questions.
Please describe the **most recent** traumatic event that you experienced through your job.

Approximately how long ago did this event occur?

years and months

Please use the space provided to help us understand the stressful aspects of your job.
That is, what do you find stressful about your job and why?
Please use the keyboard to type your response.
Some events that you might have experienced throughout your job are listed below. Please be sure to answer the column on the left side as well as the column on the right side.

On this side, please tell us whether you have experienced each event.

<table>
<thead>
<tr>
<th>Event</th>
<th>Not at all distressing</th>
<th>Somewhat distressing</th>
<th>Moderately distressing</th>
<th>Very distressing</th>
<th>Extremely distressing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line of duty death</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Violence towards yourself (e.g., assault)</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Other threat to your personal safety</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Injury to a co-worker</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Death of a patient</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Near death of a patient</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Death of a child</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Multiple casualties</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Injured or ill child</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Injured or ill elderly person</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Patients who were physically assaulted</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Patients who were sexually assaulted</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Patients involved in motor vehicle accidents</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Patients who were robbed</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Patients with gunshot wounds</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Patients with stab wounds</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Burn patients</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Prolonged resuscitation</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Contact with infectious body fluids (e.g., HIV)</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Handling a dismembered/disfigured body</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Suicide victim</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>
Appendix D: Consent Form

UNIVERSITY OF WINDSOR

LETTER OF INFORMATION FOR CONSENT TO PARTICIPATE IN RESEARCH

TITLE: Emergency Service Providers' Perceived Organizational Environment and its Role in the Development of Traumatic Stress and Posttraumatic Growth

You are invited to participate in a research study conducted by Lori K. Gray, M.A. and Dr. Dennis L. Jackson, Ph.D. from the Psychology Department at the University of Windsor. This study is being conducted for the purpose of Lori Gray's Ph.D. studies. This study is funded by a doctoral fellowship from the Social Sciences and Humanities Research Council of Canada as well as grants or scholarships from the International Society for Traumatic Stress Studies, the Ontario Graduate Scholarship Program, and the University of Windsor.

If you have any questions or comments regarding this study, please contact Lori Gray (robich4@uwindsor.ca) or Dr. Dennis Jackson (519-253-3000 extension 2229 or djackson@uwindsor.ca).

PURPOSE OF THE STUDY
This study seeks to understand how your work environment (e.g., working conditions, relationship with coworkers, and support from your organization) might impact your response to stressful events.

PROCEDURES
You are asked to complete a computer-based survey, which will ask about your opinions about the organization that employs you, various aspects of your job, potentially stressful events, and stress-related symptoms. The survey will take approximately 25 minutes to complete; however, you can save your answers and return to the survey at a later time.

POTENTIAL RISKS AND DISCOMFORTS
By participating in this study, it is possible that you might become more aware of stress-related symptoms or potentially stressful events that you have experienced. If you experience any concerns or discomforts, please discuss them with the researcher.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY
By sharing your opinions and experiences, you will help us understand how job-related events/experiences might lead to stress. It is hoped that the results will be used to decrease stress among paramedics and firefighters. In addition, you might learn more about stress-related symptoms and available services for reducing stress.

PAYMENT FOR PARTICIPATION
You will not receive payment for participating. However, the results will be presented to each organization and will be made available to anyone who participates in this study.
CONFIDENTIALITY
All responses will be anonymous. This means that you cannot be identified by completing the survey.

PARTICIPATION AND WITHDRAWAL
You can choose whether to participate in this study or not. You may refuse to answer any questions you don't want to answer and still remain in the study.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS
The results of the research will be presented to each emergency service organization that agreed to participate in this study. In addition, the results will be made available on the following website:
http://web4.uwindsor.ca/units/researchEthicsBoard/studyresultforms.nsf/VisitorView?OpenForm

SUBSEQUENT USE OF DATA
Responses will be kept by the researcher for subsequent studies. The anonymity and confidentiality guarantees outlined above continue.

RIGHTS OF RESEARCH SUBJECTS
You may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; telephone: 519-253-3000, ext. 3916; e-mail: lbunn@uwindsor.ca.

Please select one of the following options:

O I have read the above information and agree to participate in this study.

O I do not want to participate in this study.
### Appendix E: Intercorrelations among the Main Study Variables

<table>
<thead>
<tr>
<th>Overall Trauma</th>
<th>Index Trauma</th>
<th>IES-R</th>
<th>PTGI</th>
<th>Team Cohesion</th>
<th>Organizational Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall trauma</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity</td>
<td>Distress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity</td>
<td>—</td>
<td>.75**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress</td>
<td>.75**</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Index trauma</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity</td>
<td>.64**</td>
<td>.57**</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress</td>
<td>.49**</td>
<td>.65**</td>
<td>.80**</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IES-R</strong></td>
<td>.32**</td>
<td>.40**</td>
<td>.36**</td>
<td>.40**</td>
<td>—</td>
</tr>
<tr>
<td><strong>PTGI</strong></td>
<td>.24**</td>
<td>.21**</td>
<td>.24**</td>
<td>.19**</td>
<td>.25**</td>
</tr>
<tr>
<td>Team cohesion</td>
<td>.07</td>
<td>-.05</td>
<td>.04</td>
<td>-.03</td>
<td>-.25**</td>
</tr>
<tr>
<td>Team cohesion</td>
<td>.06</td>
<td>-.06</td>
<td>.03</td>
<td>-.04</td>
<td>-.25**</td>
</tr>
<tr>
<td>Courtesy</td>
<td>.08</td>
<td>-.04</td>
<td>.04</td>
<td>-.03</td>
<td>-.23**</td>
</tr>
<tr>
<td><strong>Organizational support</strong></td>
<td>-.03</td>
<td>-.12</td>
<td>-.10</td>
<td>-.17**</td>
<td>-.18**</td>
</tr>
<tr>
<td><strong>Organizational stress</strong></td>
<td>.14*</td>
<td>.08</td>
<td>.15*</td>
<td>.09</td>
<td>.07</td>
</tr>
<tr>
<td>Autonomy</td>
<td>.01</td>
<td>.00</td>
<td>-.01</td>
<td>-.01</td>
<td>-.04</td>
</tr>
<tr>
<td>Role clarity</td>
<td>.11</td>
<td>.02</td>
<td>.12</td>
<td>.07</td>
<td>-.00</td>
</tr>
<tr>
<td>Utilization of skills</td>
<td>.08</td>
<td>-.01</td>
<td>.11</td>
<td>.02</td>
<td>.01</td>
</tr>
<tr>
<td>Workload</td>
<td>.19**</td>
<td>.24**</td>
<td>.21**</td>
<td>.20**</td>
<td>.29**</td>
</tr>
<tr>
<td><strong>Organizational commitment</strong></td>
<td>.03</td>
<td>-.03</td>
<td>.04</td>
<td>-.03</td>
<td>-.11</td>
</tr>
<tr>
<td>Affective</td>
<td>-.04</td>
<td>-.12</td>
<td>-.04</td>
<td>-.11</td>
<td>-.27**</td>
</tr>
<tr>
<td>Normative</td>
<td>-.05</td>
<td>-.07</td>
<td>-.09</td>
<td>-.13*</td>
<td>-.15**</td>
</tr>
<tr>
<td>High sacrifice</td>
<td>.06</td>
<td>.02</td>
<td>.09</td>
<td>.04</td>
<td>.02</td>
</tr>
<tr>
<td>Low alternative</td>
<td>.09</td>
<td>.08</td>
<td>.13*</td>
<td>.12</td>
<td>.11</td>
</tr>
</tbody>
</table>

*Note.* Continued on following page
### Appendix E Continued

<table>
<thead>
<tr>
<th>Overall trauma</th>
<th>Organizational stress</th>
<th>Organizational commitment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Autonomy</td>
<td>Role clarity</td>
</tr>
<tr>
<td>Severity</td>
<td></td>
<td>.13*</td>
</tr>
<tr>
<td>Distress</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index trauma</td>
<td></td>
<td>.21**</td>
</tr>
<tr>
<td>Severity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress</td>
<td></td>
<td>.09</td>
</tr>
<tr>
<td>IES-R</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PTGI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team cohesion</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Team cohesion</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Courtesy</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Organizational support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational stress</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role clarity</td>
<td>.13*</td>
<td></td>
</tr>
<tr>
<td>Utilization of skills</td>
<td>.21**</td>
<td>.49**</td>
</tr>
<tr>
<td>Workload</td>
<td>.09</td>
<td>.24**</td>
</tr>
<tr>
<td>Organizational commitment</td>
<td>.20**</td>
<td>.12</td>
</tr>
<tr>
<td>Affective</td>
<td>.17**</td>
<td>.31**</td>
</tr>
<tr>
<td>Normative</td>
<td>.22**</td>
<td>.16**</td>
</tr>
<tr>
<td>High sacrifice</td>
<td>.12*</td>
<td>-.06</td>
</tr>
<tr>
<td>Low alternative</td>
<td>-.02</td>
<td>-.10</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01. ***p < .001.
### Appendix F: Correlations between the Demographic and Main Study Variables

<table>
<thead>
<tr>
<th></th>
<th>Gender</th>
<th>Education</th>
<th>Employment status</th>
<th>Supervisor</th>
<th>Manager</th>
<th>Status of duties</th>
<th>Years of service</th>
<th>Years with organization</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall trauma</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity</td>
<td>-0.07</td>
<td>-0.09</td>
<td>0.05</td>
<td>-0.17**</td>
<td>-0.12</td>
<td>0.07</td>
<td>0.17**</td>
<td>0.18**</td>
<td>0.15*</td>
</tr>
<tr>
<td>Distress</td>
<td>0.02</td>
<td>-0.03</td>
<td>-0.04</td>
<td>-0.12</td>
<td>-0.08</td>
<td>0.15*</td>
<td>0.16*</td>
<td>0.16*</td>
<td>0.20**</td>
</tr>
<tr>
<td>Index trauma</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity</td>
<td>-0.08</td>
<td>0.03</td>
<td>0.00</td>
<td>-0.17**</td>
<td>-0.07</td>
<td>0.06</td>
<td>0.31**</td>
<td>0.31**</td>
<td>0.24**</td>
</tr>
<tr>
<td>Distress</td>
<td>0.03</td>
<td>0.09</td>
<td>0.02</td>
<td>-0.17**</td>
<td>-0.09</td>
<td>0.04</td>
<td>0.29**</td>
<td>0.27**</td>
<td>0.27**</td>
</tr>
<tr>
<td>IES-R</td>
<td>0.04</td>
<td>0.09</td>
<td>0.07</td>
<td>0.02</td>
<td>-0.01</td>
<td>0.20**</td>
<td>0.04</td>
<td>0.10</td>
<td>0.06</td>
</tr>
<tr>
<td>PTGI</td>
<td>0.06</td>
<td>0.06</td>
<td>-0.04</td>
<td>-0.04</td>
<td>-0.12</td>
<td>-0.02</td>
<td>0.03</td>
<td>-0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Team cohesion</td>
<td>-0.18**</td>
<td>-0.13*</td>
<td>0.00</td>
<td>-0.12</td>
<td>-0.13</td>
<td>0.02</td>
<td>0.15*</td>
<td>0.14*</td>
<td>0.09</td>
</tr>
<tr>
<td>Team cohesion</td>
<td>-0.15*</td>
<td>-0.13*</td>
<td>0.05</td>
<td>-0.11</td>
<td>-0.13</td>
<td>0.01</td>
<td>0.12</td>
<td>0.12</td>
<td>0.04</td>
</tr>
<tr>
<td>Courtesy</td>
<td>-0.18**</td>
<td>-0.12</td>
<td>-0.03</td>
<td>-0.12</td>
<td>-0.11</td>
<td>0.02</td>
<td>0.16*</td>
<td>0.13*</td>
<td>0.12</td>
</tr>
<tr>
<td>Organizational support</td>
<td>0.01</td>
<td>-0.05</td>
<td>0.07</td>
<td>-0.08</td>
<td>-0.10</td>
<td>-0.04</td>
<td>-0.14**</td>
<td>-0.14**</td>
<td>-0.09</td>
</tr>
<tr>
<td>Organizational stress</td>
<td>-0.02</td>
<td>-0.04</td>
<td>0.10</td>
<td>-0.21**</td>
<td>-0.21**</td>
<td>0.08</td>
<td>0.19**</td>
<td>0.15*</td>
<td>0.16*</td>
</tr>
<tr>
<td>Autonomy</td>
<td>-0.10</td>
<td>-0.08</td>
<td>-0.09</td>
<td>-0.40**</td>
<td>-0.26**</td>
<td>-0.11</td>
<td>0.32**</td>
<td>0.28**</td>
<td>0.23**</td>
</tr>
<tr>
<td>Role clarity</td>
<td>0.01</td>
<td>-0.04</td>
<td>0.04</td>
<td>-0.04</td>
<td>-0.07</td>
<td>0.11</td>
<td>0.03</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Utilization of skills</td>
<td>0.01</td>
<td>0.02</td>
<td>0.14*</td>
<td>-0.04</td>
<td>-0.08</td>
<td>0.16*</td>
<td>0.00</td>
<td>-0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>Workload</td>
<td>0.06</td>
<td>0.03</td>
<td>-0.02</td>
<td>0.03</td>
<td>-0.08</td>
<td>0.11</td>
<td>0.09</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Organizational commitment</td>
<td>-0.28**</td>
<td>-0.15*</td>
<td>-0.12</td>
<td>-0.21**</td>
<td>-0.07</td>
<td>0.06</td>
<td>0.16*</td>
<td>0.15*</td>
<td>0.12</td>
</tr>
<tr>
<td>Affective</td>
<td>-0.16*</td>
<td>-0.11</td>
<td>-0.03</td>
<td>-0.08</td>
<td>-0.16*</td>
<td>0.01</td>
<td>-0.06</td>
<td>-0.06</td>
<td>-0.02</td>
</tr>
<tr>
<td>Normative</td>
<td>-0.11</td>
<td>-0.11</td>
<td>0.02</td>
<td>-0.08</td>
<td>-0.23**</td>
<td>0.01</td>
<td>-0.01</td>
<td>-0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>High sacrifice</td>
<td>-0.33**</td>
<td>-0.06</td>
<td>-0.13*</td>
<td>-0.20**</td>
<td>0.10</td>
<td>0.01</td>
<td>0.24**</td>
<td>0.24**</td>
<td>0.17**</td>
</tr>
<tr>
<td>Low alternative</td>
<td>-0.09</td>
<td>-0.08</td>
<td>-0.12</td>
<td>-0.13</td>
<td>0.09</td>
<td>0.10</td>
<td>0.20**</td>
<td>0.17**</td>
<td>0.10</td>
</tr>
</tbody>
</table>

**Note.** Gender (male, female), education (high school, college, university and postgraduate), employment status (full time, part time or retired), supervisor and manager (yes, no) status of duties (regular duties, light duties or disability), supervisor (yes, no), manager (yes, no), years of service and years with current organization (less than 5 years, 5 to 10 years, 10 to 15 years, 15 to 20 years, more than 20 years), age (30 years old and younger, 31-40 years old, 41-50 years old, 51 years old and up).

*p < .05. **p < .01.
### Appendix G: Summary of Hypotheses and Results Obtained in the Present Study

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Organizational Variable</th>
<th>Hypothesized Relationships</th>
<th>Results Obtained in the Present Study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Relationship with Traumatic Stress</td>
<td>Relationship with Posttraumatic Growth</td>
</tr>
<tr>
<td>1</td>
<td>Role clarity</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>2</td>
<td>Utilization of skills</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>3</td>
<td>Autonomy</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>4</td>
<td>Workload</td>
<td>Curvilinear</td>
<td>Curvilinear</td>
</tr>
<tr>
<td>5</td>
<td>Organizational support</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>6</td>
<td>Team cohesion</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>7</td>
<td>Affective commitment</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td></td>
<td>Normative commitment</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>8</td>
<td>High sacrifice commitment</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>8</td>
<td>Low alternative commitment</td>
<td>Positive</td>
<td>Negative</td>
</tr>
</tbody>
</table>

*Note. ns = statistically not significant.
Continued on next page.*
### Appendix G, Continued

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Variables</th>
<th>Hypothesized Relationships</th>
<th>Results Obtained in the Present Study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Relationship with Traumatic Stress</td>
<td>Other</td>
<td>Relationship with Traumatic Stress</td>
</tr>
<tr>
<td>9 &amp; 10</td>
<td>Absenteeism</td>
<td>Positive</td>
<td>Positive correlations with organizational stress and high sacrifice and low alternative commitment. Negative correlations with organizational support, team cohesion, and affective and normative commitment.</td>
</tr>
<tr>
<td>11</td>
<td>All organizational variables and trauma exposure</td>
<td>Organizational variables will predict traumatic stress above and beyond trauma exposure</td>
<td>Other</td>
</tr>
</tbody>
</table>
VITA AUCTORIS

Lori Gray was born in 1979 in Toronto, Ontario. She graduated from Michael Power, St. Joseph's High School in 1998. She pursued undergraduate studies through the University of Guelph and graduated with a Bachelor of Science (Honours) degree in Psychology in 2002. Thereafter, she commenced graduate studies in Clinical Psychology at the University of Windsor in Windsor, Ontario. Lori completed the Master of Arts degree in Clinical Psychology in 2004. She is currently a Ph.D. Candidate in Clinical Psychology at the University of Windsor and is completing her predoctoral internship at the Centre for Addiction and Mental Health in Toronto, Ontario. She has received scholarships and awards from the International Society for Traumatic Stress Studies, Canadian Psychological Association, American Psychological Association, Social Sciences and Humanities Research Council of Canada, Ontario Graduate Scholarship Program, and University of Windsor. Lori will complete the Ph.D. degree in Clinical Psychology in August 2008.