Organizational Resilience to Workplace Trauma

Predicting Post-Incident Workgroup Outcomes through Clinical Data Mining

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Abstract

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by

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Traumatic workplace incidents (critical incidents) occur with unfortunate regularity and with significant repercussions for affected organizations. Critical incident stress management (CISM) is the process organizations utilize to respond to traumatic incidents. CISM includes services provided before, during and after the occurrence of an incident. CISM service units, often a specialty service of employee assistance programs (EAPs), deploy workplace trauma professionals to support organizations post incident. While CISM seeks to support both employee and organizational recovery, trauma research oriented towards individual recovery and resilience dominates the literature. This research contributes to less-prevalent studies that explore how incident characteristics and organizational variables influence organizational level outcomes. By emphasizing the contextual versus the psychological, this research aligns with psychosocial and ecological theories and practice. Contextual factors are particularly relevant for organizational recovery and may even be as important for individual recovery as individual differences and various treatments. This research addresses two

important gaps in the literature. Despite the fact that social workers represent the leading discipline delivering CISM service, the social work profession has published little research on CISM programs. Second, while CISM units nationwide collect massive amounts of data on workplace trauma, there are no published, practice-based, studies capitalizing on the potential discoveries within existing CISM data. Employing the methodology of clinical data mining, this exploratory research examines the proposition that knowledge of a *pre-incident* factor (prior workgroup trauma), *incident* characteristics (incident type, industry type, incident severity) and *service delivery* variables (types of services delivered) predict for *organizational resilience*. Organizational resilience is explored by examining outcomes in the areas of post-incident performance restoration, employee retention and attendance, the helpfulness of services for employees and management and perception of adequacy of organizational response. Multivariate analysis conducted for performance restoration indicates that positive predictors include certain industry types and a single incident type - criminal acts. Prior workgroup trauma and higher incident severity scores were negative predictors for performance. Multivariate analysis for perceived adequacy of organizational response indicates that positive predictors include certain incident types and implementation of on-site services. Prior workgroup trauma was a negative predictor for adequacy of organizational response.

Dedication

This dissertation is dedicated first, to my wife, Isabelle. Not only was she instrumental in encouraging me to pursue a long-held desire to earn a PhD, she then provided much needed and greatly appreciated support throughout the demanding and challenging four years required to complete it. The dissertation is also dedicated to our sons, Christopher and Daniel. Isabelle and I are very proud of their passion for questioning, exploring and learning.

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First, I wish to thank my good friend Thomas Lund for his encouragement to apply to a PhD program and his “helpful conversations”, which allowed me to maintain direction and motivation. Many, many thanks go to Deidre Downes, Fiona Eisenberg, Lisa Gale, Larry Iannotti and Andrew Schmidt, my fellow doctoral students who provided the support (and the laughs) I needed to see this through to the end.

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Special thanks are owed to the entire CUNY Graduate Faculty in Social Welfare and the Hunter College School of Social Work. In particular, I want to first thank Michael Fabricant for the extra time he extended to me during the application process. He provided insight into the many advantages the program might hold for me. His predictions all proved true. Instrumental to my decision to attend the program was Paul

Kurzman's considerable reputation in the field of occupational social work. Later, Paul's instruction on organizational theory contributed to the choice to conduct a dissertation exploring organizational versus individual outcomes and therefore, I was most pleased when Paul agreed to serve on my committee. Bernadette Hadden contributed critical expertise in bivariate and multivariate analysis, guiding the statistical approach from very early on. From the time I took her course until the final analysis, she led me through research design options, selecting statistical tests and solving problems. I also wish to thank Harriet Goodman. From the very first day of the first class, she was a source of ongoing support, consultation, inspiration, encouragement and guidance.

Since this research is based in the workplace, it was imperative to involve a committee member who could evaluate the study from a workplace perspective. I was therefore very fortunate to enlist Daniel Hughes, an experienced EAP professional from Mount Sinai Medical Center, to serve as an external committee member.

I am forever indebted to my faculty advisor, Irwin Epstein. For many years, Irwin has guided doctoral students through the challenging territory that is clinical data mining. While clinical data mining dissertations present multiple challenges, if undertaken with a skilled guide, they lead inevitably to discoveries that improve practice. Irwin's substantial dedication to doctoral students is matched only by his good humor and his ability to inspire and motivate. I am immensely pleased to be counted among the many who owe their attainment of their PhD to his tutelage.

Finally, I want to acknowledge the thousands of occupational social workers who, every day, assist workers to meet the challenges inherent in earning a living and in particular, those on the front lines responding to traumatic workplace incidents.

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Introduction

Societal Impact of Traumatic Incidents

Although potentially traumatic incidents such as industrial accidents, violence, mass disasters and other sources of emotional trauma have been prevalent for decades, in recent years, massive acts of terrorism (September 11, 2001), devastating natural disasters (Hurricane Katrina) and tragic school shootings (Virginia Tech) have raised public awareness about psychological trauma to new levels. The wars in Afghanistan and Iraq will likely contribute to this trend. In the aftermath of trauma, victims generate much compassion in others, eliciting powerful societal forces that demand a rapid response to ameliorate the tragic circumstances of victims. As a result, highly public events such as these reinforce the value of studying psychological trauma and its outcomes, at all levels.

Responding to Trauma: The Role of Social Work

The response to traumatic events typically comes from a range of sources – private practitioners, various types of mental health and social service agencies and organizations established specifically to address the needs of trauma victims. For large scale incidents, the Federal Emergency Management Agency (2007) lists over eighty such organizations, including NASW, the Children's Disaster Services and the American Red Cross. For locally contained incidents, various community-based organizations and emergency services assist victims and families. In support of trauma relief efforts, NASW

has a long-term agreement with the American Red Cross for qualified social workers to deliver disaster mental health services (Webb, 2000). Social workers in such agencies and within other organizations are instrumental in providing various supportive resources and delivering specialized interventions to individuals, organizations and communities.

Critical Incident Stress Management and Social Work Practice

Potentially traumatic incidents occurring in a work organization are referred to as "critical incidents". When they occur, employees frequently look to the employer organization to intervene and respond. To respond, the majority of organizations typically rely on employee assistance programs (EAPs). Specifically, most EAPs provide trauma response services through a process called critical incident stress management (CISM), which consists of several components and incorporates various strategies and interventions (reviewed in a later section). CISM includes all steps taken and services provided before, during and after the occurrence of a critical incident. In large national EAPs, dedicated CISM units often manage and deliver CISM services. As part of CISM, employers provide a variety of on-site interventions, in which social workers play a critical role. They staff centralized CISM call centers, comprise 40% of American Red Cross disaster mental health volunteers (American Red Cross, 2000) and represent a large portion of social service agency and mental health agency staff responding to trauma. The majority of staffs in EAP-based CISM units and providers comprising specialized networks delivering on-site interventions are social workers (Brown & Schulze, 2008; Leslie, 2008; Tanner, 1991).

Objectives of CISM

The purpose of CISM for *individuals* is to reduce traumatic symptoms, build resiliency, reinforce positive coping strategies and refer to appropriate treatment and supports. When a work organization is the setting for CISM, employers additionally seek various group level outcomes that serve to stabilize the organization and contribute to *organizational* resilience. Employee attendance, retention and performance following a critical incident are such organizational outcomes. Additionally, organizations seek to provide services that assist both employees and management and desire to be perceived as having responded adequately to the traumatic incident. Several operational measures for these outcomes, as assessed by an EAP CISM unit in this study are the objects of inquiry.

Unexplored Available Data: Social Work Research in the Workplace

The beginning ideas that would eventually evolve into this dissertation originated in my experiences following the September 11th terrorist attacks. Under the auspices of a national EAP, over a two-week period, I conducted CISM interventions for employees and consulted with managers just north of ground zero. Observations from serving several organizations stimulated questions about organizational context, organizational response, critical incident services provided and their impact on organizational resilience to workplace trauma. These issues remained of interest as I followed the literature and

discourse over post-trauma intervention in the workplace. Upon entering the PhD Program at the Graduate Center of the City University of New York, Hunter College, these same questions served as the foundation for developing this dissertation, a practice-based social work study conducted in the workplace.

Googins (1993) asserted that as the workplace became a more acceptable arena for social work practice, an alignment would develop between social work and workplace interests, which would in turn create opportunities for social work research in the workplace. This prediction now rings true. Social workers not only now have long-term workplace experience, enabling them to identify workplace trends and questions, but also the skills to conduct corresponding research. Characteristic of the workplace is its contained environment in which measurement and data collection are often more feasible and better funded than in other settings (Googins, 1993). Years ago Trice and Roman (1972) predicted that sophisticated EAP databases would offer much promise for social work research and evaluation. Following these predictions, however, Googins (1993) also noted that social work had not yet fully capitalized on the rich source of data that exists in the workplace. He further pointed out that if social work's historical discomfort with the workplace and near exclusive identification with public and nonprofit services continued, the body of workplace social work research would remain relatively small. This research seeks to add to this body of research.

From working in an EAP for twenty-five years, I was aware of the agency's extensive, computerized critical incident database and its potential for research. I was also aware that, to date, the data has been utilized only to document service delivery and to produce limited annual univariate statistics. After exploring the potential for more

extensive analysis, I obtained support for a collaborative, practice-based research project between the agency, the CISM unit and the University. A successful application to the agency's National Research Review Board allowed the research to begin and enabled me to capitalize on the opportunity to conduct workplace-based, social work research using an existing and potentially valuable EAP CISM database.

Purposes of the Study and Research Proposition

This study focuses on the organizational consequences of workplace trauma and potential predictors for outcomes on a workgroup level, as achieved by a specific, national EAP's CISM unit. The guiding proposition is that knowledge of certain pre-incident factors, incident characteristics and service delivery factors predict for organizational resilience in the areas of employee attendance, retention, and performance, helpfulness of services and perception of the adequacy of organizational response. In keeping with core principles of social work, the study emphasizes trauma practice that acknowledges but explores beyond the nature of individual differences and treatment to contextual factors in the pre and post-incident environment, as key to improving workgroup resilience and organizational outcomes.

Gaps in the Literature

This research addresses several gaps in the literature. Despite widespread reliance on social workers as providers of workplace trauma services, there is little social work research exploring whether or how contextual factors influence organizational outcomes. Further, while EAP CISM units nationwide collect massive amounts of data on workplace trauma and organizational outcomes, there are no published studies capitalizing on insights that existing CISM practice data may provide. Additionally, while prevention is an important principle of social work, social work prevention research set within the workplace is scarce. A further gap in the literature is the limited amount of research on how context affects workgroup level adaptation and its relationship to organizational outcomes. Alternatively, the literature focuses predominantly on ***individual psychological risk or resilience factors*** (Bremner, Southwick, Brett, & Fontana, 1992; Jones, Roberts, & Greenberg, 2003; King, King, & Foy, 1996; Kobasa, Maddi, & Kahn, 1982) or on ***the efficacy and safety of specific intervention techniques*** (Bisson & Deahl, 1994; Everly, Boyle, & Lating, 1999; Flannery, 1998; Gray & Litz, 2005; Hurrell, 2006; Kenardy, 2006; Litz, Gray, Bryant, & Adler, 2002; Lohr, Hooke, Gist, & Tolin, 2003; Mitchell, 2004; Richards, 2001; Rick, Perryman, Young, Guppy, & Hillage, 2004; Rose, Bisson, Churchill, & Wessely, 2006). Also prominent is literature addressing ***neurobiological predispositions*** (Bremner, 1997; Buchanan & Adolphs, 2004; Charney, 2003; Fuller, 1983; Gilbertson, 2002; Golier & Yehuda, 1998; McEwen & Stellar, 1993; Morgan, 2000; NBGH, 2008; Pham, Taylor, & Seeman, 2001) and research on the ***nature of specific incidents and their influences on***

recovery (J. L. Bell, 1995; Bolton et al., 2004; Brewin, Andrews, & Rose, 1998; Cagnetta & Cicognani, 1999; Curran et al., 1990; Flannery, 1996, 2001; Gluhoski & Wortman, 1996; B. L. Green et al., 1990; Hillenberg & Wolf, 1988; King et al., 1996; King, King, Foy, Keane, & Fairbank, 1999; Lloyd & D'Antonio, 1992; Madakasira & O'Brien, 1987; Norris, Friedman, & Watson, 2002; Pennebaker & O'Heeron, 1984; Raphael, 1986; Resnick, Acierno, Kilpatrick, & Holmes, 2005; Rothbaum, Foa, Riggs, Murdock, & Walsh, 1992; Von Slagmott & Rabobank, 1992; Wieclaw et al., 2006).

Representative of the literature on contextual factors, Noblet, Rodwell and McWilliams (2006) argue that the relationship between internal factors (i.e. coping styles, psychological risk factors) and external, supportive resources (i.e. work-based organizational support) are underdeveloped theoretically and empirically. While trauma practice typically conceptualizes predictors for coping in terms of individual capacities, Noblet, Rodwell and McWilliams (2006) provide evidence that external resources and environment heavily influence the development of internal resources (individual capacities) or if already developed, whether individuals employ them effectively in service of recovery. In short, context influences both individual and organizational outcomes. Without question, individual psychological risk and resilience factors, the impact of neurobiological factors and the effectiveness of various interventions are critical to trauma practice at all levels. Contextual factors, however, deserve equal attention, especially in the workplace immediately following trauma where despite the impracticality of conducting widespread individual assessments and treatment it is imperative to establish a supportive post-trauma environment. Several social work

authors advocate for just such an orientation (J. L. Bell, 1995; Black, Jeffreys, & Hartley, 1993; Carlton & Stephenson, 1990; Heggar, 1993; Moonilal, 1982; Morris, 2005).

Relevance to Social Work Practice

Workplace trauma as a field of study is highly relevant for social work practice. Traumatic incidents such as homicides, assaults, robberies, disasters, accidents and injuries are widespread in the world of work (Bureau of Labor Statistics, 2010; Federal Bureau of Investigation, 2008, OSHA, 2007). Workers in transportation, emergency services, financial and retail settings, health and social services are particularly vulnerable to exposure to incidents (Bolton et al., 2004; Rick et al., 2004). Of further relevance to social work is that extended active deployment of our military, natural disasters, violence (often covered extensively by the media) and the continuing threat of terrorism have raised public awareness about post-traumatic stress to new heights. Social workers are instrumental, not only in ameliorating the direct affects such incidents have on employees as individuals, but in intervening to reduce the repercussions for affected organizations as well (Brewin, Andrews, Rose, & Kirk, 1999; Kleinberg, 2005). Occupational social workers bring several advantages to the practice of organizational response to workplace trauma. Workplace social workers assist individuals in their relationship to employment in general and assist organizations in responding to workplace trauma in particular. Social work trauma practice expertly targets contextual factors in the immediate post-incident environment, which are critical for improving workgroup functioning and organizational resilience. Finally, through their work in

employee assistance programs, critical incident stress management units, agencies and private practice, social workers comprise, by far, the largest portion of mental health professionals responding to workplace trauma (American Red Cross, 2000, Leslie, 2008, Webb, 2000)

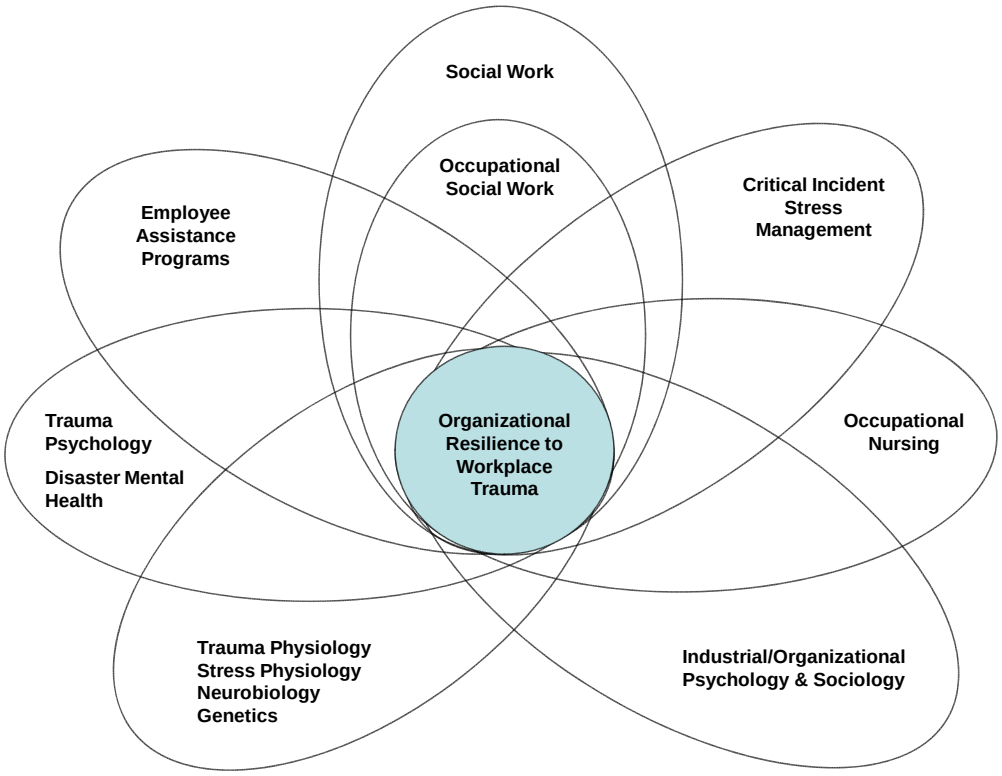
Human Subject Protections

No human subject protection issues arose in conducting this research. All data was previously collected by the CISM unit staff and is de-identified, workgroup level data. I secured approval from the agency's National Research Review Board on 9/12/07. Per agreement with the National Research Review Board, data extraction was accomplished in such a manner that I had no knowledge of the identities of client organizations served or individual service requestors and therefore had no capability to associate findings with any particular client organization or individual. The Hunter College Institutional Review Board (IRB) approved the research on 10/7/07. The project was confirmed as exempt under 45 CFR 46.101(b) (4). Subsequently, Human Subjects Exempt Continuing Review Progress Reports (Protocol #: HC-090712951) were reapproved between 2008 and 2010. The Graduate School and University Center, City University of New York granted a dissertation proposal clearance for human participants on 7/17/09.

Overview of the Dissertation

Organizational resilience following workplace trauma situates within several fields beyond social work, occupational social work and employee assistance programs. These fields include industrial-organizational sociology and psychology, critical incident stress management, trauma psychology, disaster mental health, occupational nursing and neurobiology (as it relates to trauma physiology, stress response and genetically determined aspects of trauma vulnerability). Therefore, this multidisciplinary perspective informs the literature review to follow and several key concepts incorporated into the dissertation. Figure 1 – “Workplace Trauma: A Multidisciplinary Intersection”, illustrates how the topic of organizational resilience to workplace trauma situates at the intersection of various disciplines.

Figure 1 - Workplace Trauma: A Multidisciplinary Intersection



Chapter one, “Overview of Workplace Traumatic Stress” provides context for organizational resilience to workplace trauma, covering the prevalence of critical incidents, the mechanisms from which stress responses evolve and defining key terms. It distinguishes between individual and organizational resilience and reviews the history of trauma assessment. Subsequent sections address the evolution of on-site, workplace trauma interventions and describe the services provided by the CISM unit in the study. The chapter also details various types of critical incidents, their association with trauma disorders, their impact on employees and the workplace and defines the overall strategic process of critical incident stress management (CISM). The chapter continues with a discussion of how organizational response to workplace trauma fits well within the

specialty social work field of occupational social work. A literature review identifies relevant organizational variables within the pre and post incident environment and their association with various organizational outcomes. The chapter closes with theoretical models that offer explanatory frameworks for organizational resilience to workplace trauma.

Chapter two, “Research Methodology” first classifies variables in the literature into phases relative to the sequence of events surrounding a critical incident. Next, it reviews the research purpose and provides a methodological overview. It then presents several advantages for a practice-based study, set within this particular employee assistance program. Subsequent sections describe the research setting, data collection procedures, data screening and management of validity and reliability challenges. The chapter then provides an overview of the database and describes data extraction. The next section states the research proposition guiding bivariate analysis. The chapter closes with a discussion of clinical data mining and limitations of non-controlled studies.

Chapter three, “Univariate Analysis of a Critical Incident Database and an Incident Severity Scale Reliability Analysis**”** presents a descriptive analysis of key predictor variables and organizational outcomes measured by the unit. It also reports on a reliability analysis of a situation assessment instrument developed by the CISM unit to measure the relative severity of a critical incident.

Chapter four “Bivariate Analyses: Traumatic Incidents, Services and Organizational Outcomes” reports Chi Square Cross Tabulations, t-test and ANOVA results for associations between independent variables and several organizational outcome variables. The chapter closes by identifying variables significantly associating

with each outcome at the bivariate level, which informs variables to be included in the multivariate analysis.

Chapter five, “Multivariate Analyses: Traumatic Workplace Incident Characteristics, Services and Outcomes” reports results for hierarchical logistic regressions, run with selected variables for two organizational outcomes – performance restoration and perceived adequacy of organizational response.

Finally, chapter six, “Summary and Implications” reviews major findings, recommendations for the CISM unit, implications for practice and suggestions for future research.

Chapter One

Overview of Workplace Traumatic Stress

This first section reviews potentially traumatic incidents and their prevalence and defines key terms. Next, it discusses neurobiological factors and multiple determinants of traumatic stress and trauma disorders. It then covers the concept of resilience, on both an individual and organizational level. A section on traumatic stress disorders follows, including a discussion of the historical development of the clinical diagnosis of traumatic stress and the range and prevalence of individual reactions to traumatic incidents.

Potentially Traumatic Incidents and their Prevalence

A potentially traumatic event is one that seriously disturbs the physiological or psychological homeostasis of an organism (J. Payne, Nadel, Britton, & Jacobs, 2004). Incidents potentially traumatizing individuals (criminal acts, natural disasters, accidents and terrorism) are ubiquitous in society, contributing to traumatic stress as a prominent social problem. The PTSD Alliance (2006) estimated 70% of adults in the United States have experienced a potentially traumatic event at least once in their lives. Researchers state the proportion of the population experiencing at least one traumatic event in their lifetime ranges from 50% to 66% (Breslau et al., 1998; B. L. Green, 1994; Kessler, Somnega, Bromet, & Nelson, 1995; Ozer, Best, Lipsey, & Weiss, 2003). Furthermore, certain individuals will experience multiple trauma in their lives, evidenced by estimates

that 17% of men and 13% of women have experienced more than three traumatic incidents (PTSDA, 2006).

Definitions

Starting with common definitions, *stress* is a state of mental or emotional strain or tension resulting from adverse or demanding circumstances in which a person is unable to minimize their perception, recollection, anticipation and imagination of threatening images (Oxford American College Dictionary, 2002). Webster's Dictionary (2008) defines *trauma* as any injury, whether physically or emotionally inflicted. The Oxford English Dictionary (1989) defines *traumatic stress* as a psychic injury, especially one caused by emotional shock. *Psychologically traumatic stress* refers to an experience that is emotionally painful, distressful, or shocking, resulting in distinct physiological processes and emotional and cognitive effects, one being the creation of distressful emotional memories. Psychologically traumatic stress is an individual's physical and psychological response to a sudden, usually unexpected (Flannery, 1992), overwhelming event which causes intense fear (van der Kolk, McFarlane, & Weisaeth, 1996). Additionally, Flannery (1992) characterizes psychologically traumatic stress as a response to a situation in which a person has little control over events. Kim and Diamond (2002) agree, claiming that perceived control mitigates trauma. Payne and colleagues (2004) however, challenge the experience of loss of control as a defining characteristic of trauma and argue that even in the most chaotic and threatening situations, most people perceive they have some degree of personal control.

Neurobiological Factors

While “traumatic stress” often implies a psychological state, it involves well-documented physiological and neurobiological aspects as well. Neuroscience researchers have identified various cognitive and neurological correlates to traumatic stress, which involve endocrinology and neurology and several types of perception and memory, each served by discrete neural systems and each operating quite differently in the contexts of threatening versus nonthreatening stimuli. Threatening circumstances signal a severe discrepancy between existing and desired states (Kaplan, 1983). Numerous neurobiological structures - including the amygdala, hypothalamus, and hippocampus, among others - are involved in both the evaluation of and response to threatening stimuli (Buchanan & Adolphs, 2004). Several neurobiological processes appear to be protective. Low levels of cortisol (Charney, 2003; Morgan, 2000), locus coeruleus norepinephrine (LC-NE) (Golier & Yehuda, 1998) and hypothalamic corticotropin-releasing hormone (CRH) (Bremner, 1997) appear to protect from post-traumatic stress disorder (PTSD) and depression. Conversely, high levels of the adrenal steroid, dehydroepiandrosterone (DHEA) and neuropeptide - Y (NPY) counteract harmful physiological stress responses (Morgan, 2000). In addition, genetically determined hippocampal functioning predicts for PTSD risk (Gilbertson, 2002). Various neurochemicals seem to mediate vulnerability to stress-related psychopathology (McEwen & Stellar, 1993). However, neurobiology and genetics alone do not predict for risk of traumatic stress.

Multiple Determinants of Traumatic Stress and Trauma Disorder

While psychology, genetics and neurobiology contribute to traumatic stress, environmental conditions also produce dysfunctional physiological, psychological and behavioral states (Kim & Diamond, 2002). Due to human resilience, however, the occurrence of an external traumatic incident does not always result in a trauma disorder. Rather, an interactive, dynamic process, involving various mediating neurobiological, psychological factors (J. Payne et al., 2004) and, pertinent to this study, critical contextual factors (Kim & Diamond, 2002) ultimately determine the stress response. The more effective are various mediating influences, the more resilient is a person exposed to severe stress.

Resilience: Individual vs. Organizational

Morbidity rates reveal the majority of those exposed to a traumatic event adjust positively (Harvey & Bryant, 1998). Individual resilience involves tolerating initial shock and personal disruption while preserving one's emotional and functional abilities (Bonanno, 2004). Resilience is also the ability to recover quickly from illness, change, or misfortune. Bonanno (2004) adds it is the ability to maintain stable equilibrium in the face of stress, the ability to integrate threatening experience and its meaning into one's prior personality organization and preferred view of self. Newman (2005) defines individual resilience as the human ability to adapt in the face of tragedy, trauma, adversity, hardship, and significant life stressors. I define *organizational resilience* then

as the ability of organizations to recover from workplace trauma, preserving their structure, functioning and stability.

Historically, researchers focused on individual, genetic, physiological and psychological *risk factors.* Such pathology-oriented research, which dominated the literature, tended to investigate individual factors that predispose to traumatic stress disorders. Risk factors include problematic family history, previous exposure to trauma, childhood victimization (Bremner et al., 1992) and maturity level (King et al., 1996). Jones, Roberts and Greenberg (2003) summarize additional risk factors including sensitivity to threat, overdeveloped sense of shame, blaming orientation and a tendency to perceive situations as uncontrollable. Observing the widespread attention to individual risk and pathology, Litz (2005) cautioned against underestimating individual resilience–oriented research, which focuses on *protective factors* or individual traits that predispose towards a positive adaptation. As opposed to preventing illness, promoting improved resilience focuses researchers and practitioners on supporting positive adjustment. Bonanno (2004) and Newman (2005) dispute that resilience is a characteristic only found in exceptionally emotionally healthy individuals. They argue that there is a wide range of available and learnable skills associated with resilience. Protective factors associated with resilience include optimism, intellectual ability, active coping style, ability to convert helplessness into hopefulness and emotional intelligence (Charney, 2003). Emotional intelligence, the ability to understand, accurately perceive, express, and regulate emotions (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995), facilitates adjustment (Graves, Schmidt, & Andrykowski, 2005). Other protective factors include the ability to find meaning in situations and the belief that one can influence one's experience (Kobasa et

al., 1982). Such protective factors may offset genetic, neurobiological and psychological liabilities that create vulnerability to stress-related disorders. The more protective are these various mediating influences, the more resilient are employees who then experience less dysfunction. By extension, the organization that relies on affected employees for its functioning is more resilient as well.

Immediately post-incident, organizations cannot feasibly or practically assess for *individual* risk factors or response, nor provide widespread individual treatment that addresses individual employee adaptation. Organizations do have the ability, and often the resources, to shape the post incident environment and provide immediate group level assistance and other contextual supports, which may enhance individual adaptation. In this manner, organizations committed to a supportive post-incident environment support not only individual adaptation, but organizational adaptation as well.

Since organizational resilience derives from individual resilience, it is instructive to explore individual stress disorders. Perhaps the most recognizable stress disorder is the diagnosis of PTSD. The next section discusses the historical development of the clinical diagnosis of PTSD and other traumatic stress disorders.

Traumatic Stress Disorders

Historical Development of Traumatic Stress Diagnoses. While this section will focus on specific traumatic stress disorders, it is important to acknowledge that many disorders, not always associated with trauma, may develop subsequent to it. Many clinical disorders potentially derive, directly or indirectly, from a traumatic event,

including childhood disorders, amnestic or other cognitive disorders, mood disorders, substance abuse, dissociative reactions, impulse control problems or sexual dysfunction. Of central interest here, however, is the history of the diagnosis of traumatic stress disorders specifically.

The first diagnostic and statistical manual (DSM), published by the American Psychiatric Association (1952), contained a diagnosis of Gross Stress Reaction. It was included under a general diagnostic category of Transient Situational Personality Disorders. DSM I describes the disorder as "transient in character and which appears to be an acute symptom response to a situation without apparent underlying personality disturbance" (APA, 1952, p. 40). In DSM-II (APA, 1967), the general diagnostic category of Transient Situational Personality Disorders, was replaced by Transient Situational Disturbances and the specific diagnosis of Gross Stress Reaction was replaced with Adjustment Reaction of Childhood or Adjustment Reaction of Adult Life. The DSM-II diagnostic system maintained the same orientation as the previous version – traumatic stress as a temporary, non-pathological reaction to an abnormal situation. It also continued to view individuals as exhibiting various responses to stressful events, ranging from positive, resilient responses to pathological reactions. It also continued to associate diagnoses with psychodynamic theory. In DSM-III (APA, 1980), the overall category Transient Situational Disturbances became Adjustment Disorders. However, DSM-III removed stress-related precipitants from consideration under Adjustment Disorders. Instead, DSM III addressed stress-related symptoms in a completely new diagnosis, Post-Traumatic Stress Disorder (PTSD) and grouped it under Anxiety Disorders. PTSD became the appropriate diagnosis for "symptoms following a

psychologically traumatic event that is generally outside the range of usual human experience" (APA, 1980, p. 236). DSM-III also departed from the previous two manuals by adopting an atheoretical approach to diagnosis. Previous traumatic stress references to "neuroses" gave way to strictly descriptive criteria. PTSD had three core criteria including the presence of a significant stressor that would evoke symptoms universally, re-experiencing of the event and social withdrawal. The diagnosis also required at least two additional symptoms from among hyper-alertness, sleep disturbance, guilt, cognitive impairment, avoiding activities that trigger memory of the event or intense reactions when exposed to similar situations. In summary, significant changes from DSM-II were the removal of psychotic symptoms from the criteria, recognition of stress reactions as an anxiety disorder and adding detail regarding symptomatology (APA, 1980, p. 238). The revision, DSM-III-R (APA, 1987) added a fourth core criteria (increased arousal) and required symptoms duration of at least one month. DSM-IV (APA, 1994) added yet another criterion - functional impairment. The disorder needed to create distress or impairment in social, occupational or other areas of functioning. DSM-IV also added a related diagnosis of Acute Stress Disorder (ASD), which required symptoms to maintain for at least two days after the precipitating event but to remit within one month. The core criteria for ASD included exposure to a traumatic event, dissociative symptoms, re-experiencing of the event, avoidance of memory stimulation, increased arousal and functional impairment. The technical revision, DSM-IV-TR (APA, 2000) maintains essentially the same criteria.

There is a range of individual responses to traumatic incidents that range from resilient reactions to ASD and PTSD. The following section reviews these responses and their prevalence.

Prevalence of Various Reactions to Stress. In terms of the overall incidence of PTSD in the general population, Kessler (2005) estimated 3.5% of the population suffers from PTSD in a given year. The PTSD Alliance (2006) states 5% of Americans have PTSD. The National Institute of Mental Health reports that approximately 7.7 million American adults suffer from PTSD at any given point in time (NIMH, 2006), while the PTSD Alliance (2006) reports 13 million Americans suffer from the condition

It is important to review responses to trauma at three levels – resilient, acute (ASD) and chronic (PTSD). In resilient and normal stress reactions, in the immediate aftermath of a potentially traumatic event, victims or close observers of the event typically experience physical, emotional, cognitive and behavioral symptoms. Such symptoms, experienced within a few days of an event, while considered sub-clinical are still a source of great distress. However, research on resilience supports that while such initial stress reactions lead *potentially* to mental disorders, *frequently* they do not. An estimated 86% of those exposed are likely to exhibit resilient or normal stress responses and will not develop either ASD or PTSD (APA, 2000; Harvey & Bryant, 1998). The remaining portion, however, are at risk for developing a trauma disorder, ASD or PTSD. Kim and Diamond (2002) regard traumatic stress disorders as evolving from inherently protective physiological, emotional, cognitive and behavioral structures, originally designed to adapt humans to their environment. In the case of trauma disorders, however, they are misdirected, creating a disequilibrium that proves maladaptive. Based on various

emotional, cognitive, behavioral and physiological indicators, clinicians infer such disequilibrium exists and diagnose a traumatic stress disorder, as either ASD or PTSD.

Among those exposed to a traumatic event, a cited estimate of the prevalence of ASD is 14% (APA, 2000). A portion of those exposed eventually progress from ASD and display symptoms that meet the criteria for a diagnosis of PTSD. Two sources (APA, 2000; Harvey & Bryant, 1998) suggests 11% of all those exposed develop PTSD while another (Breslau et al., 1998) estimates that 9% of those exposed will develop PTSD.

To summarize the estimated relative incidences of stress reactions in individuals and therefore, in any given workgroup following a potentially traumatic event, 86% of those exposed are likely to exhibit normal stress responses and will not develop ASD or PTSD, 3% will develop ASD only and 11% will first develop ASD and also, eventually, PTSD (APA, 2000; Harvey & Bryant, 1998). While pathological and dysfunctional stress responses are critically important, sometimes overlooked is the probability that most employees exposed to a traumatic incident will experience normal reactions and resume prior functioning, regardless of whether they receive any intervention. In the urgency to respond rapidly to potentially traumatic events, those coordinating trauma interventions should note that the majority of those exposed to an event are not likely to develop any lasting pathological reactions. This has important implications for workplace trauma interventions provided immediately after an event. Organizational responses typically target workgroups where all three levels of stress reactions are present and therefore need to be effective and appropriate for each stress response. Workplace interventions, provided without differential assessment of reactions may have been central to the controversial debate over whether such interventions harm certain individuals (Rose et

al., 2006). It will be useful to consider next the history of interventions typically employed by organizations to respond to workplace trauma.

The Evolution of On-site, Workplace Trauma Interventions

The next chapter section traces the evolution of on-site interventions for workplace trauma. It begins with a brief review of the wide range of trauma interventions in general use. Next, it covers the historical development of interventions as applied in the workplace. The section closes with a description of the interventions provided by the CISM unit in the study.

Range of Trauma Interventions

The trauma literature reflects a wide range of interventions. Table 1, Variations on Traumatic Stress Intervention Technique, below illustrates the diversity of referenced approaches (Flannery, 1996; Hurrell, 2006; Mitchell, 2004; Resnick et al., 2005; Rose et al., 2006).

Table 1: Variations on Traumatic Stress Intervention Technique

Crisis intervention Crisis management briefing Critical incident defusing Critical incident stress debriefing Eye movement desensitization & reprocessing Exposure therapy Group cognitive behavioral therapy Multiple stressor debriefing Person-centered cathartic treatment	Postvention Psychiatric stress debriefing Psychological debriefing Psychological defusing Psychological first aid Stress management therapy Trauma debriefing Trauma-focused cognitive behavioral therapy Traumatic event debriefing

This is only a partial list of intervention designations, some of which differ essentially only by label, some by their combination of techniques and others by the degree of emphasis placed on one technique or another. Some are indentified by their location for delivery, such as postvention, which is provided within schools (Kerr, Brent, McKain, & McCommons, 2005), or critical incident stress debriefing, which is identified with emergency services and the workplace (Mitchell, 1983). Despite the apparent diversity, most interventions tend to rely on one of three central strategies – supportive/stabilizing, cognitive/ behavioral or re-exposure – in various combinations or emphases. The following section reviews the historical development of trauma interventions.

Historical Development of Trauma Intervention

Historically, organized approaches for responding to traumatic stress emerged from three developments, recurring over time. The first is the occurrence of dramatic, publically visible and extraordinarily stressful events. The second is recognition that most individuals who experienced the event directly or observed it presented with similar symptoms. The third, relevant to social work, is that while post traumatic symptoms may have been suggestive of various known medical and psychological disorders, the condition was assessed to be mostly related to environmental influence, as opposed to assuming individual disorder and immediately administering treatments.

The specialized field of traumatic stress intervention traces its roots to mining disasters in the early 1900s. In France, in 1906, Edwin Sterlin organized an early

intervention to respond to a massive mining accident (Mitchell, 2004). A major historical and public event focusing attention on traumatic stress was World War I. By 1917, the syndrome “shell shock” or “war neurosis” became a common description for symptoms of traumatized soldiers, who would otherwise have received a diagnosis consistent with neuropsychiatric disorders of the time. Salmon and Fenton (1929), US Army psychiatrists, wrote a detailed analysis of traumatic stress in soldiers. Their description of the Army’s management of “war neuroses” represents an early attempt to address symptoms of trauma specifically. Of relevance to social work is their documentation of how the Army incorporated professional social workers into treatment teams addressing traumatic war stress. In fact, their fifth chapter, “Observation and Treatment”, contains a section titled, “Care of Cases of Nervous Diseases”, which specifically details the importance of social workers influencing social and environmental factors critical to support a soldier’s recovery (Salmon & Fenton, 1929).

Deahl (2000) notes how World War II stimulated efforts to address traumatic stress symptoms. Addressing “combat fatigue”, military psychiatrists again contributed to advancements in trauma intervention, treatment advances that led directly to the foundation of the National Institute for Mental Health and spawned social psychiatry, the treatment of individuals outside of asylums. Deahl (2000) notes that delivering timely, effective interventions related to highly visible events, such as war, positively influences public perception towards both those who suffer from trauma symptoms and the mental health professionals who treat them. Both perceptions contributed to the advancement of trauma intervention.

Eric Lindemann (1944) was a psychiatrist practicing in Boston at the time of the disastrous Coconut Grove nightclub fire. Based on his work with acute reactions of survivors and relatives of the deceased, Lindemann developed the practice of crisis intervention (G. Caplan, 1964; G. Caplan, Kessler, & Goldston, 1986; Lindemann, 1944). The relevance of Lindemann's work for traumatic stress is that he clearly defined post-disaster, acute symptoms as a syndrome of normal psychological and somatic response that, while mirroring symptoms of clinical disorders, was separate and distinct from them. Lindemann's theory was a forerunner of critical incident theory and set the stage for a psychosocial view of stress. For Lindemann, post-trauma symptoms derive significantly from the event and current environmental stressors as opposed to mostly individual weakness or individual developmental liabilities.

During the Vietnam War years, from 1965 to 1973, returning Vietnam veterans displayed severe traumatic symptoms and experienced significant readjustment difficulties to civilian life. National attention on the experiences of veterans again led to refinements to trauma interventions and set the stage for the development of the intervention of critical incident stress debriefing (debriefing).

Critical Incident Stress Debriefing (CISD)

This section first traces events that contributed to debriefing coming into prominence as a workplace intervention. It then reviews debriefing's intentions and some controversy surrounding the intervention. Next, it discusses debriefing's phases, process and its application to various settings and populations.

Emergence of Critical Incident Stress Debriefing. Jeffrey Mitchell (1983), the originator of CISD or debriefing, previously noted that while crisis intervention services were available, they did not consistently engage emergency professionals effectively. In the mid - 1970s, seeking a systematic program to mitigate traumatic stress in emergency personnel, Mitchell modified civilian-oriented, crisis intervention approaches (Volpe, 1999), creating the technique of debriefing (Mitchell, 1983). Throughout the 1980s, the technique was introduced to the workplace and the number of debriefings provided in that setting escalated. At approximately the same time, DSM III (APA, 1980) adopted PTSD as a new diagnosis. The near simultaneous emergence of the new diagnosis and the proliferation of the technique of CISD in the workplace seemed to reinforce each other. In subsequent years major events contributed to further increased use of the diagnosis and the technique - the Gulf War (1990), the first bombing of the World Trade Center (1993), the Oklahoma City bombing (1995) and the destruction of the World Trade Center (2001).

Objectives of Debriefing. The literature cites three central objectives for debriefing. First, debriefing seeks to stabilize workers by eliciting group support, normalizing stress reactions, enhancing employee resilience, teaching positive coping skills, promoting emotional processing and referring individuals in great distress to treatment (Everly & Mitchell, 1997, 1998; Mitchell, 1983, 1986, 2004; Mitchell & Everly, 1995). Several authors support a role for debriefing in rapid stabilization, asserting that when group participants discuss their thoughts and emotions in a supportive environment it reduces the intensity of acute stress symptoms (Gray & Litz, 2005; Hurrell, 2006; Jordan, 2002; Roberts, 2000; Rose et al., 2006). Second, following

exposure to traumatic stimuli, emergency service workers or military responders frequently need to redeploy the site of the event to provide further aid (Everly & Mitchell, 1998). It is important to note that this is rarely the case with civilian employees. A third objective of debriefing and one relevant to the study is that debriefing seeks not only to stabilize the worker but the organization and the work environment as well. Rose et al. (2006) suggests that organizations realize several benefits from debriefings and other post-incident support. Post-event, organizations frequently receive consultations for managers, educational materials and various supportive services. These represent an infusion of resources and activity into the affected workplace, which may have a restorative effect and serve to stabilize the organization.

The Debriefing Controversy. Whether debriefing contributes to *prevention* of traumatic stress disorders, specifically PTSD and subsequent research into debriefing as preventive triggered much controversy. Several researchers found debriefing to be an effective preventive technique (Everly & Boyle, 1999; Everly & Quatrano-Piacentini, 1999; Hurrell, 2006). However, Rose et al. (2006), in their meta analysis, concluded that debriefing is not effective for prevention of PTSD.

In terms of debriefing as a *treatment* for traumatic stress, Mitchell (2004) is unequivocal, writing he never intended debriefing as a treatment modality. This is consistent with Marmor (1979), who offered the useful distinction between crisis work, which is directive, deals only with the present, is time limited and seeks to restore functioning - versus treatment, which is exploratory, deals with past and present, is ongoing and seeks to improve upon past functioning. Mitchell (2003) elsewhere clearly states debriefing seeks to mitigate, not treat stress symptoms. Despite Mitchell's

clarifications several researchers explored whether debriefing is an effective *treatment* for PTSD and, not surprisingly, concluded it is not (Litz et al., 2002; Sijbrandij, Olff, Reitsma, Carlier, & Gersons, 2006).

Several researchers concluded that debriefing, primarily due to its reliance on re-exposure, not only is ineffective for prevention and treatment of PTSD, but that it is actually harmful (Bisson, Jenkins, Alexander, & Bannister, 1997; Mayou, Ehlers, & Hobbs, 2000; McNally, Bryant, & Ehlers, 2003; Rose et al., 2006; Rose, Bisson, & Wessely, 2001). In addition, Lilienfeld (2007) included debriefing in his provisional list of potentially harmful therapies. Deahl (2000, 2006) however, disputed such claims, disagreeing with the Rose et al. (2006) decision to exclude non-randomized controlled trials from their meta-analysis. Deahl (2006) points out that the nature of traumatic events often makes randomized controlled trials (RCTs) unfeasible. He contends that ethics dictate that organizations not withhold intervention for controls to study future outcomes. Kenardy (2006) also challenged the disconfirming results on the grounds they tested widely variable and inadequate forms of debriefing. Kenardy (2006) noted that there has been no comparison of *specific types* of interventions under RCTs and that until such research is forthcoming, we cannot state that one approach is better, or worse.

Phases and Process of Debriefing. Debriefing is a modified crisis intervention tool designed to assist groups after exposure to critical incidents. Debriefing is semi-structured and engages participants cognitively, psychologically and educationally (Hurrell, 2006; Mitchell, 2004). It involves several phases leading to a planned re-experiencing of the incident. Mitchell (1983) describes the phases of debriefing as 1) introductions and review of the process, 2) factual review of the incident, 3) thoughts and

impressions about the incident, 4) emotional reactions, 5) symptom normalization, 6) education and identification of coping strategies and 7) disengagement, future planning and reentry. Debriefing (Everly & Mitchell, 1997, 1998; Mitchell, 1983, 2004; Mitchell & Everly, 1995) relies on re-exposure in that it guides participants through re-experiencing the event, eliciting images, memories and reactions. It also incorporates cognitive-behavioral elements and stabilization strategies.

Applications of Debriefing. Mitchell (1983) originally designed debriefing for *specific settings and populations*, namely first responders (secondary victims of trauma), such as firefighters, police, military and Red Cross workers, not for primary victims who experience the incident directly (employees). Another intention of debriefing was to apply it to *homogeneous groups* with similar levels of exposure, two characteristics that fit well with emergency workgroups but perhaps less well in corporate, industrial or union workgroups. Emergency responders normally have a high level of homogeneity in terms of values, experience, degree of training and exposure. There is support in the literature for debriefing interventions working best when applied to groups consisting of participants with similar levels of exposure (Dyregov, 1997). Also intended by Mitchell (2004) is that *trained peer-debriefer*s (e.g. a fellow firefighter, paramedic, etc.), would co-facilitate the intervention along with a professional. An important application of debriefing is that it should occur as one of several *integrated components of critical incident stress management (CISM) services*, as opposed to a stand-alone intervention. Mitchell (2004, p. 4) states clearly that debriefing is not intended to be a stand-alone intervention. Richards (2001) conducted a field trial that compared debriefing as a stand alone intervention with debriefing provided and as part of several integrated services. The

integrated services group had fewer symptoms post-trauma. In terms of the *timing of intervention*, most interventions take place within a few days of an incident. Several authors note the advantage of immediate intervention in ameliorating symptoms (Gray & Litz, 2005; Jordan, 2002).

Psychological First Aid (PFA)

PFA represents an alternative to debriefing as a worksite intervention. Brymer et al. (2005) define PFA as an evidence-informed intervention to assist in the immediate aftermath of trauma or disaster. Mason (2003) states, as an alternative to debriefing, PFA provides instrumental assistance and support, which reduce traumatic stress. It assumes a broad range of early reactions exist among participants and anticipates that not all participants are at risk for disorders. It provides support similar to debriefing with the exception that it minimizes re-exposure to the incident and is therefore less intrusive emotionally. It focuses more on the consequences of trauma than on the traumatic experience itself (Weinberg, Nuttman-Shwartz, & Gilmore, 2005). It does not assume any specific status among recipients and is appropriate for heterogeneous groups. PFA, while relying centrally on supportive stabilization, also makes use of cognitive and psycho-educational techniques.

Objectives of Psychological First Aid. There are multiple objectives for PFA. They include establishing a personal connection, promoting feelings of safety, stabilizing individuals, offering practical assistance and information, empowering victims and facilitating linkages to services. Principles and techniques of PFA have proved to be

applicable and practical in field settings and are appropriate for all those exposed, regardless of developmental level (Brymer et al., 2005).

Phases and Processes of Psychological First Aid. Like CISD, PFA includes several discrete and identifiable phases. The phases of PFA include 1) initiation of contact with those impacted by an event, 2) engagement in a non-intrusive manner, 3) focus on safety issues, 4) stabilization strategies, 5) needs assessment, 6) practical assistance, 7) connection to available social supports, 8) coping strategies, 9) stress education, 10) confirmation of duration of aid and 11) referral.

Applications of Psychological First Aid. PFA authors (Brymer et al., 2005; Weinberg et al., 2005) caution professionals to make no assumptions about the experiences, stability or needs of those exposed to trauma. Compatible with this approach, PFA seeks to avoid pathologizing and focuses instead on promoting adaptive responses of all individuals.

Crisis Management Briefing (CMB)

CMB, while not provided as often as debriefing or PFA, has its place in workplace trauma response. Some incidents affect a large number of people. In the workplace, a large-scale event could involve an entire worksite or a large department and require leaders to address a large, emotionally affected group (Pulley, 2005). CMB is appropriate when an organization is in the midst of a large-scale critical incident and must quickly disseminate information, reduce confusion, decrease anxiety, deescalate reactions, normalize responses and identify supportive resources. CMB consists of a

team of organizational leaders and trauma professionals who facilitate a large meeting in order to stabilize a chaotic organizational situation quickly. The format is similar to a structured town hall meeting and can involve hundreds of people. CMB provides critical information and clarifies facts about the incident. Facilitators then provide education on stress and constructive coping strategies and identify resources available for assistance. Clinician facilitators are available to provide counseling for any severely overwhelmed individuals. Crisis management briefing predominantly emphasizes information and stabilization.

On-site Management Consultation and Individual Employee Sessions

In addition to (and rarely in place of) a group intervention, worksite trauma programs provide an on-site professional to assist individual managers and local officials with comprehensive guidance on responding to employees' questions and emotions following a traumatic event. On-site management consultation offers specific ways to be supportive and identifies behaviors to expect in the group throughout several phases and timeframes associated with trauma response. It also gives managers the opportunity to receive support for themselves. In addition to management consultations, employers often provide for counselors on-site to offer specific assistance to individual employees.

Interventions Delivered by the CISM Unit in the Study

The CISM program in this study employs these five core interventions in assisting organizations – debriefing, psychological first aid, crisis management briefing, management consultation and individual employee counseling and additionally, non-specific organizational interventions, designed to assist employers with stressful workplace occurrences such as downsizing, radical organizational change, work stress and conflict resolution. Interventions employed to address such incidents encompasses interventions and techniques common to occupational social work and EAP strategies. Organizational interventions include group seminars on topics such as stress or job loss and grief groups for non-traumatic deaths. Another common organizational intervention is conflict resolution – a service that assists employees and/or managers experiencing severe conflict in work relationships. In conflict resolution, professional social workers or other mental health professionals utilize a solution-focused approach to find ways to improve communication and solve employee conflicts. Unresolved workgroup conflict can have a toxic affect on the overall work environment and is therefore of great concern to employers.

In summary, a variety of on-site interventions emerged as strategies to assist workgroups in coping with both potentially traumatic critical incidents and stressful organizational incidents. Unlike organizational incidents, which are often less severe in nature, slow in developing and/or somewhat predictable, traumatic critical incidents are extreme incidents that can occur anywhere or anytime. A school, a travel facility (airport, bus terminal or train station), a bank, a shopping mall, a factory, a law office or a retail

store - in short, any workplace is vulnerable to unpredictable, severely threatening incidents. The next section first discusses critical and organizational incidents and then reviews a prevalent overall approach to responding to them - critical incident stress management (CISM), an approach integrating several components and used by the CISM unit in the study.

Critical Incidents and Critical Incident Stress Management (CISM)

This section discusses subtle differences in the usage and meaning of the terms - critical incident and traumatic event - and proposes preferred definitions. It then describes various types of incidents, their prevalence and the degree to which they associate with stress disorders. Next, the section reviews the prevalence of incidents within certain industries. A review of how workplace trauma affects employees and organizations follows. A closing section outlines critical incident stress management and its components, distinguishing CISM as an overall, multi-component, management response from the specific intervention technique of critical incident stress debriefing (CISD), described above. The failure to appreciate the distinction of CISD as only one component of CISM was one cause of controversy around CISD (Deahl, 2000; Hurrell, 2006; Yamey, 2000).

Terminology: Traumatic Event vs. Critical Incident

The literature cites type of critical incident as a key predictor variable for various outcomes, including organizational outcomes (J. L. Bell, 1995; Bolton et al., 2004; Brewin et al., 1998; Cagnetta & Cicognani, 1999; Curran et al., 1990; Flannery, 1996, 2001; Gluhoski & Wortman, 1996; B. L. Green et al., 1990; Hillenberg & Wolf, 1988; King et al., 1996; King et al., 1999; Lloyd & D'Antonio, 1992; Madakasira & O'Brien, 1987; Norris et al., 2002; Pennebaker & O'Heeron, 1984; Raphael, 1986; Resnick et al., 2005; Rothbaum et al., 1992; Von Slagmott & Rabobank, 1992; Wieclaw et al., 2006). Frolkey (1996), defines a critical incident as an extreme situation, occurring in the workplace, which overwhelms an employee's ability to cope. Frolkey's meaning incorporates two elements - exposure (employee's experience or witness an extreme and threatening situation) and a mediated reaction (a reaction filtered by individual differences in personal history, perception and interpretation of the event, which may or may not overwhelm the employee's personal resources). This definition of a critical incident mirrors the DSM IV definition of traumatic stress and reflects a psychosocial perspective – trauma as determined environmentally, psychologically and the interaction between the two. However, due to inconsistent use in the media and literature, the term "critical incident" has evolved to the point that it does not always incorporate the second aspect of its original meaning – overwhelming individual coping resources. Critical incident, as often used today, connotes only that an incident is extraordinary and severe in nature, without consideration of a mediated and therefore, variable individual response. This usage is consistent with workplace practice, where, due to the requirement to

provide a rapid response, CISM professionals rarely individually assess exposed employees to determine their various levels of reaction. Systematic screening for risk factors, protective factors and degree of resiliency is not feasible in the immediate post-incident environment. Therefore, while the extraordinary nature of the incident is observable, the extent of individual response is usually not assessable and therefore, remains unknown.

Reflecting this reality, practitioners frequently refer to a workplace event as a critical incident based solely on the event being outside ordinary human experience, without reference to it's mediated impact on individuals. I see two possible advantages to this single criteria definition – critical incident as an extreme incident in the workplace. First, it allows for a distinction between a critical incident and a traumatic event, rather than using the terms interchangeably. *All* threatening, extraordinary workplace events would be *critical incidents* but a critical incident is also a *traumatic event* for a given employee or workgroup only when it overwhelms coping resources. Therefore, while robberies or industrial disasters are always critical incidents, they may or may not be traumatic incidents for all employees within a given workgroup. The second advantage to this distinction is that it alerts and reminds workplace officials, social workers and other professionals assisting to be aware that most services and interventions are triggered solely by the occurrence of a critical incident, with little understanding of whether the incident is traumatic or for whom. Services therefore, need to be safe and effective for *all* recipients - resilient employees *and* those with clinical symptoms of trauma. This is especially relevant in view of potential iatrogenic effects as argued by Rose et al. (2006),

who state that certain forms of debriefing are harmful and interfere with otherwise normal recovery to trauma.

Critical Incident Types and Associated Incidence of Stress Disorders

Next follows a discussion of major categories of incidents for which employers frequently seek assistance and the subtypes of incidents within each category. Where available, this section cites information on the incidence of traumatic stress associated with various types of incidents.

Accidents. Accidents, large scale or localized, occur in infrastructure, industrial, or transportation contexts. Infrastructure examples include a building fire or a building or bridge collapse, which can also be associated with a flood or other natural disaster. Industrial examples include explosions, chemical fires, chemical spills and toxic exposure. Flannery (1996) reported man made disasters and toxic exposures are increasing. As society becomes more technologically complicated, mechanical parts' fatigue, human error and negligence result in man made catastrophes that lead to psychological trauma (Lloyd & D'Antonio, 1992). In 1984, Union Carbide's massive, toxic gas leak in Bhopal, India, frequently cited as the world's worst industrial disaster, resulted in more than 20,000 deaths (Eckerman, 2005). Bhopal is a prime example of a large-scale incident. Less extensive, localized industrial accidents include individual electrocutions, falls or accidents due to heavy machinery malfunctions. Fatalities or serious injuries are a common result. Major construction sites are especially dangerous. Transportation accidents, one of the most frequent sources of trauma, involve airlines,

trains, buses or cars and are among the leading causes of death in several countries. Many accident survivors suffer permanent injuries and severe psychological distress (Cagnetta & Cicognani, 1999). Accidents often result from human error or failure to follow safety precautions. In one study, 46% of motor vehicle accident victims suffered from PTSD with an additional 20% exhibiting sub-clinical symptoms (Blanchard et al., 1995).

Criminal Acts. Workplace incidents often involve criminal acts such as arson, riots, kidnapping, hostage taking, physical assault, sexual assault or robbery. Armed robbery occurs especially frequently (Bradit & Normandeau, 1987). In 2008, the FBI recorded 5,682 bank robberies (Federal Bureau of Investigation, 2008). Von Slagmott and Rabobank (1992) reported that following a sample of 2,500 bank robberies, 20% of employees presented with symptoms of PTSD. Elklit (2002) reports that 25% of robbery victims develop ASD. Many criminal acts, such as rape or assault, involve violence, and are severely traumatic. Flannery (2001) and Bell (1995) have written extensively about these criminal incidents. The prevalence of post-crime PTSD is estimated at 5.5% for American men and 11.5% for women (Norris, 1992). Brewin et al. (1998) found that 20% of crime victims met criteria for PTSD six months after the event. Compared to men, female employees exposed to violence or threats of violence are 33% more likely to develop a stress related disorder (Wieclaw et al., 2006). Sexual assault consistently produces a significant percent of traumatic disorders. In one study, 47% of sexual assault victims exhibited PTSD (Rothbaum et al., 1992). As violence in general increases in society, there is a similar increase in violence in the workplace (Blair, 1991; Gwaltney, 1987; Mantell & Huntting, 1987; Walsh & Rue, 1987). Increasingly, disgruntled co-workers and customers are assaulting employees and managers (Blair, 1991; Flannery,

1996; Mathews, 1994). Blair (1991) expands the definition of criminal acts to include unsafe business practices, poor building code enforcement and environmental toxicity.

Fatality/Death. Fatalities occur in the context of several incident categories. *Homicide* can be the result of various criminal acts (Castillo & Jenkins, 1994). It may occur as part of a robbery or occur when an employee is murdered performing his or her job functions (Pulley, 2005). Line of duty homicide examples include police officers killed on the job, firefighters lost in a rescue attempt, lawyers murdered for retribution, disgruntled employees killing managers, colleagues murdered by co-workers or retail or health care staff fatally attacked by aggressive clients. In 2006, workplace murder was the leading cause of death in working women and the second leading cause of workplace death in men (OSHA, 2007). Workers in retail sales and service industries are at the highest risk for homicide (Bradit & Normandeau, 1987; Jenkins, Layne, & Kisner, 1992; Keim, 1999; Toscano, 1995; Yang & Lester, 1988). Employees die in natural disasters (hurricanes), transportation accidents (train crash) and industrial disasters (workers killed in an industrial explosion). Others die from illness. An employee may die unexpectedly of a heart attack at work or a co-worker may die expectedly after a long fight with a terminal illness. Supporting workplace fatalities as a common occurrence are statistics for 2008, which state that there were 5,051 workplace fatalities (Bureau of Labor Statistics, 2010).

Employee deaths at home or in a hospital can have a traumatic workplace impact as well. Suicide is particularly stressful for the workplace and therefore merits separate consideration. In recent years, workplace suicides have increased. For example, in 2008, workplace suicides rose 28% over the previous year (Bureau of Labor Statistics, 2010).

Suicide, whether occurring visibly in the workplace and witnesses by co-workers (Bolton et al., 2004) or unobserved, off-site (Pennebaker & O'Heeron, 1984) can be a particularly traumatic experience for co-workers. This is due primarily to suicide being self-inflicted and usually unexpected. Co-workers can be self-blaming for not noticing symptoms and unable to resume routine functioning. Coping with another's suicide generates stress reactions and severely challenges coping skills (Antai-Otong, 2001).

War. The relationship between war-zone stressors and combat-related posttraumatic stress is well-documented (King et al., 1996; King et al., 1999). One of the strongest contributors to the increased attention afforded post-traumatic stress was the study of delayed stress reactions in Vietnam veterans (Goodwin, 1987). War trauma has a special characteristic, its chronic, continuous nature (Norris et al., 2002). War trauma affects the workplace when organizations supporting the military (especially defense contractors) or reporting on wars (embedded reporters) expose civilian employees to combat. In addition, reservist employees die in battle, devastating colleagues. Other influences occur when war correspondents, civilian employees, regular army, air force or naval service men and women, national guardsmen or reservists report to work after discharge or post-deployment. Many of those returning to work suffer from PTSD, traumatic brain injury or other disabilities (J. L. Bell, 1995) and experience adjustment difficulties (Deahl, Gillhman, Thomas, Searle, & Srinivasan, 1994). The wars in Afghanistan and Iraq are responsible for a multitude of employee-veterans who suffer from trauma related conditions. The estimated incidence of post-traumatic stress in war veterans ranges between 22% (O'Brian & Hughes, 1991) to 30.6% (Kulka et al., 1990).

Natural Disasters. Wildfires, floods, tornadoes, hurricanes and earthquakes can be devastating to a large area, potentially traumatizing whole communities, including thousands of employees (Hillenberg & Wolf, 1988). Not only are they disruptive psychologically and injurious physically, they destroy infrastructure, communications and transportation and separate coworkers, family and friends, which compromise supportive responses and delay interventions, increasing traumatic stress (NASW, 2006). The incidence of trauma disorders in flood victims is 28% (B. L. Green et al., 1990) and in tornado survivors it is 59% (Madakasira & O'Brien, 1987). Curran et al. (1990) and Raphael (1986) found that 22% to 50% of natural disaster victims suffer from PTSD.

Terrorism. Terrorism involves systematic threats or violence, perpetrated by an individual or organized group, normally to achieve a political objective or make a large-scale public statement. The technological sophistication of modern day weapons increases the deadliness of terrorist attacks. Further, instantaneous, mass communications magnify the impact. Characteristics of terrorism include sudden, unpredictable and dramatic incidents, designed to terrorize groups of various sizes. Fatalities and/or maiming and fear generation are often intended results. The trauma and shock produced by terrorist acts is extreme and disrupts significantly daily routines and feelings of security (Fredrickson, Tugade, Waugh, & Larkin, 2003). Following large-scale terrorist acts, it is often difficult to procure a secure, protected area, a high priority for crisis management. Typically, due to the instability of the environment, communications are disrupted and chaos rules, exacerbating victim's feelings of vulnerability and insecurity. Terrorism frequently comes in the form of bombings or shootings or sabotage. Bio-terrorism is a relatively new form, as illustrated by the death of five people from anthrax

sent through the mail in 2001 (Kestenbaum, 2008). In one study of terrorist attacks 50% of survivors had PTSD six months after the incident (Curran et al., 1990). Terrorism has been particularly devastating to the workplace as seen in the two terrorist attacks on World Trade Center and the anthrax deaths cited above.

Illness. As with suicide, while disease can occur secondarily to several incident categories, it also occurs unrelated to them and can be a direct source of traumatic stress. Illness, whether due to an occupational etiology or occurring naturally, can be debilitating, causing serious impairment and affecting the workplace. Bolton et al. (2004) note that witnessing or experiencing a life-threatening illness can produce traumatic stress in co-workers. Gluhoski and Wortman (1996) discuss the traumatic repercussions of severe illness. Large-scale infectious epidemics, such as bird flu, or their threat, create significant workplace stress.

Injury. Mitchell (2004) and DSM IV (APA, 2000) suggest that serious injury qualifies as a potentially traumatic incident. Acute stress reactions are likely to occur following a traumatic encounter that involves physical injury to self or others (Antai-Otong, 2001). Serious employee injuries sustained within the workplace or outside of work can stress co-workers. Lester et al. (2001) note that 6.1 million employees experienced injuries on the job in 1997, many under traumatic conditions such as amputations, burns or severe head trauma. As noted above, health care staff is particularly vulnerable to injury resulting from attacks by clients (Antai-Otong, 2001). They also risk illness from needle pricks and a myriad of infectious diseases. Resnick, Acierno, Kilpatrick, & Holmes (2005) note that sustaining an injury increases risk for PTSD. Manufacturing and construction workers risk injury from equipment malfunctions

or unsafe working conditions. In 2008, the Bureau of Labor Statistics (2010) recorded 4.6 million non-fatal injuries and illnesses combined.

Organizational Stress and Change. Organizations can experience predictable or unpredictable crises that can severely stress a workforce. Examples include downsizing, site closing, relocation, technology change, job change, culture change, merger or acquisition, bankruptcy or outsourcing. All of which create significant stress for employers, employees and their families (Bargal & Karger, 1991; Johnson, 1995; Mor-Barak & Bargal, 2000; Rabner, Hawkins, & Hawkins, 1995). On a smaller scale, organizational stressors can evolve from an emotionally charged termination of an employee or severe conflict between workgroups or individual employees. While such incidents are, typically, not stressful on the same level as the critical incidents reviewed above, they are still be a source of disabling stress to organizations and warrant intervention to ameliorate them.

Critical Incidents within Specific Industries

While a critical incident can occur in any industry or profession, several occupational groups are at high risk for traumatic stress. These include military personnel, transportation workers (railways, maritime, aviation, road and transport), emergency service workers (fire, police, ambulance), workers in the commercial or financial sector (bank employees, retail employees), health care workers (nurses, doctors), social service workers (social workers, child welfare, public assistance) and specific industry workers (offshore oil and gas, nuclear industries, construction) (Rick,

Perryman, Young, Guppy, & Hillage, 1998). Military personnel, for example, participate in combat and hostage situations and risk becoming prisoners of war. Transportation workers witness crashes, capsized boats or experience hijacking. Emergency workers engage in traumatic rescue and recovery operations. Health care and social service workers risk exposure to the death of children and the threat of death or injury to self and co-workers. Bank tellers and store clerks face robberies, assaults, hostage taking and murder. Other industrial occupational groups risk rig disasters, mining accidents or explosions. It is additionally important to note that any employee, though not directly involved, can witness others being severely injured or killed (Bolton et al., 2004). Conversely, for an event to affect negatively employees and management, it does not need to occur within the physical workplace – as is the case with an employee assaulted at home or critically injured in an off-site motor vehicle accident. Additionally, with increasing telecommuting and home-based offices, the definition of "workplace" is continually evolving. The next section discusses the ways that traumatic stress expresses itself in the workplace.

Impact of Critical Incidents on Workers and Workplaces

Critical incident stress compromises occupational functioning. Traumatic symptoms display at work physically, emotionally, cognitively and behaviorally. Table 2, Symptoms of Traumatic Stress, illustrates symptom clusters.

Table 2: Symptoms of Traumatic Stress

Physical	**Emotional**	**Cognitive**	**Behavioral**
Fatigue	Fear	Intrusive Images	Pacing
Headache	Anxiety	Racing Thoughts	Crying
Rapid Heartbeat	Anger	Confusion	Neglecting Basic Needs
Restlessness	Grief	Poor Concentration	Blaming Self or Others
Insomnia	Shock	Preoccupations	Poor Decisions
Shortness of Breath	Irritability	Suicidal Thoughts	Abrupt Changes
Muscle Aches	Detachment	Obsessive Thinking	Social Withdrawal
Nausea	Mood Swings	Despair	Emotional Outbursts
Loss of Appetite	Guilt	Worrying	Hypervigilance
Trembling	Agitation	Catastrophizing	Hyperactivity
GI Disturbances	Depression	Low Self-Confidence	Poor Eating Habits
		Flashbacks	Substance Abuse
		Nightmares	
		Disbelief	
		Distrust	

These symptoms present in the workplace as absenteeism, poor presenteeism (attending work, but in a highly distracted state), reduced productivity, increased work conflicts, accidents, diminished morale, loss of motivation, resignation or termination from employment. When trauma is work-related, workplace reminders may trigger memory of the event, creating increased stress. When employees attempt to avoid reminders, it affects performance. Employees may socially isolate themselves as a means of avoiding talking or thinking about the trauma. Anxiety, fear, sadness and dissociative symptoms impair cognitive functioning and work skills. Arousal symptoms create difficulties with sleep, resulting in tardiness and absenteeism, poor concentration and irritability with co-workers. The employee may be ill-tempered, disrupting workgroup tasks. To the employer, the employee may appear distracted, unmotivated or irresponsible. An employee may become distressed merely at the thought of entering the

workplace (Bolton et al., 2004). Workplace expressions of traumatic stress greatly affect both employee and organization.

Traumatic symptoms among employees are widespread (Fairris & Brenner, 2001). Across all occupational groups, a significant number of individuals in the workforce will experience trauma or have a diagnosis of PTSD or ASD (Brewin et al., 1999). The impact of trauma in the workplace is of great concern for organizations. Trauma can be disruptive to the relationship between worker and employer and lead to various organizational and individual employee problems. For example, Kleinberg (2005) writes about a posttraumatic stress reaction he calls “worker’s block”, the application of symptoms of PTSD to the workplace, particularly those that relate to avoidance of stimuli, numbing, diminished interest in activities, detachment and estrangement from others. He defines it as a vocational impairment, a rapid emotional, attitudinal and relational disengagement from the job.

Due to these affects on the workplace, employers are assuming an increasing role in responding to workplace trauma. Employer response may even become more critical in view of reduced community-based social services over recent years (Akabas & Kurzman, 2005). As employers take more responsibility for workplace crises and disasters, the need for a work-based, comprehensive crisis response strategy increases accordingly (Everly & Mitchell, 1998). Critical incident stress *management* or CISM (Mitchell, 2004) as described below, is such a strategy. It involves multiple service components, including on-site interventions, all designed to meet this unique workplace need.

Critical Incident Stress Management (CISM)

Most employers utilize CISM and some occupational settings mandate them (Everly & Mitchell, 1997). CISM represents a comprehensive, integrative, multi-phased approach to crisis response (Flannery, 1998). As noted previously, CISM includes multiple components, one of which can be debriefing (CISD) or another on-site intervention. Several components of CISM align with the temporal sequence of a crisis, ranging from the pre-crisis phase through the acute crisis phase and into the post-crisis, follow-up phase. CISM is comprehensive in that it relies on various interventions that are applicable to individuals, small functional groups, large groups, organizations, and whole communities. Research has found that using an integrated approach combining different CISM components has a greater positive effect than using post-incident interventions alone (Everly, Flannery, Eyler, & Mitchell, 2001; Richards, 2001).

Components of CISM. The seven core components of CISM, as defined by Everly and Mitchell (1998), are:

1) pre-crisis preparation - such as stress management education, management training, building resilience and crisis mitigation training
2) community support programs, informational briefings, town hall meetings and staff advisement
3) defusing - a three-phase, structured small-group intervention provided within hours of a crisis to assess, triage and mitigate acute symptoms
4) a structured group discussion, usually provided shortly after the incident, designed to mitigate acute symptoms and assess the need for follow-up

5) one-on-one crisis intervention and counseling
6) family crisis intervention and organizational consultation
7) follow-up and continued support for those still in need, with referral for assessment and treatment

Typically, pre-established CISM teams, which can seek accreditation from the International Critical Incident Stress Foundation (2005), coordinate the activities of the several components to improve outcomes. Today hundreds of CISM teams exist in the US, many within government agencies, community agencies, law enforcement, emergency services, unions, the military, airlines, banks, retail stores, schools, EAPs and other organizations. The EAP CISM unit in this study coordinates various CISM services, including on-site interventions, immediately after incidents, responding to thousands of critical incidents nationwide each year.

In summary, CISM seeks to stabilize organizations and social workers play a critical role in workplace stabilization. The next section explores the historical development of social work's role in addressing workplace trauma.

Workplace Trauma: Convergence of Social Work and Work

Organizational impacts in the workplace following trauma represent a phenomenon where the ostensibly divergent worlds of social work and the business world converge. This convergence is the domain of occupational social work and the industrial, occupational specialties of other professions. As occupational social work practice operates primarily within and owes its significant growth to EAPs, an overview of EAPs

follows. The section then discusses how social workers working in CISM programs assume a central role in mediating stress in the workplace in general and more specifically, how they support organizational resilience following workplace trauma.

Post-industrial employers have come to recognize addressing human needs is as important as addressing economic needs (D. Bell, 1973)**.** Employers and social workers find common ground in the understanding that employers retain productive workers when they are satisfied, valued and managing stressful situations. Successful organizations seek and find the balance between employee and business needs. Recognition of social work's expertise in this area drives continued expansion of workplace sponsored social work, which leads to the growth of occupational social work.

Occupational Social Work (OSW)

Occupational social work practice effectively addresses workplace needs and as a result, it has emerged as a growing area of social work. Various authors and sources offer several definitions of the field, including the United Nations (1971) and several occupational social work scholars (Akabas & Kurzman, 1982; de Silva, 1988; Googins & Godfrey, 1987; Straussner, 1990; Wiener, Akabas, Sommer, & Kremen, 1971). Extracting common elements from these multiple definitions, OSW is the application of social work skill to resolve challenges of workers and promote healthier work environments. OSW seeks to improve employee performance by fostering adaptation between employees and work environments. It encompasses employment practice and policy issues. Finally, OSW is characterized by "…programs and services, under the

auspices of labor or management, that utilize professional social workers to serve members or employees and the legitimate social welfare needs of the labor or industrial organization" (Kurzman, 1987, p. 899).

Several factors support the emergence of occupational social work. Employers are raising expectations for productivity and reciprocally, employees are demanding responsive, supportive employers to help them adjust to a workplace that is increasingly a source of conflict and stress. More and more, organizations are assuming responsibility for maintaining employee health and creating supportive organizational environments to foster wellness and manage stress.

NASW's public relations campaign promotes occupational social work as an important field of practice (NASW, 2008a). OSW, by including the domain of work in assessment and practice, ensures adherence to social work's core principle – a holistic, ecological perspective, which increases practice effectiveness (Schore & Atkin, 1993; Vigilante, 1993). Social work interventions with organizations and workgroups experiencing a critical incident directly reflect this core principle of social work. Occupational social work aligns social work values with workplace needs and is a significant development for the profession. Applying a psychosocial lens to the workplace, occupational social workers consider both individual behavior and the organizational context of behavior, both of which have important applications to workplace trauma. While occupational social workers work in many fields, they are particularly present and active in the field of employee assistance.

Employee Assistance Programs (EAPs). Various sources, including the Employee Assistance Professionals Association (EAPA, 2008), define an EAP as a worksite-based

service to help employees overcome problems that negatively affect job satisfaction and productivity. Typical services include confidential counseling, career counseling and referral for dependent care services. EAPs provide strategic consultation to enhance organizational performance and address personal concerns, such as marital, family, financial, alcohol, legal or other personal issues affecting performance (Barker, 2003; Heery & Noon, 2001; IFEBS, 2008; NBGH, 2008). Integrating workplace and social work principles, Kurzman (1993) states the objective of EAPs is to preserve human and financial resources. Reflecting biopsychosocial assessment and intervention, EAP service components include supervisory and management training, intervention with workers, workplace health promotion, education, wellness programs and primary and secondary prevention. Critical incident support is yet another component.

The Employee Assistance Professionals Association (EAPA) is the largest international membership organization for employee assistance professionals, the majority of whom are social workers. Occupational social workers working in EAPs comprise the single largest professional group providing human services in the workplace (Googins, 1993; Trice & Beyer, 1982). EAPs however, are only one application of occupational social work, which is broader than the field of employee assistance. Occupational social work intervenes on several levels beyond the direct service delivery of EAPs, such as with employment practices in general, governmental workplace policies, disability determinations, consumer education, corporate community services, work-related public policy and organizational change. EAP work, however, remains the most prevalent application of occupational social work principles. Within EAPs, social work's training, skills, accredited degree programs and qualifications for licensure

legitimate and maintain social work as the predominant EAP profession (Tanner, 1991). The EAP sponsoring this research illustrates the prevalence of social workers in private employer settings. The agency employs 1,045 social workers, representing 27% of 3,875 total employees. To provide short-term EAP counseling, the agency contracts with an EAP counselor network of 7,256 social workers, by far the largest group, representing 43% of 16,777 total contracted counselors. In the agency's behavioral health division, a contracted, long-term treatment provider network consists of 20,634 social workers, representing 35% of 58,843 total providers (Leslie, 2008). Of the agency's network of contracted workplace trainers, 1,537 are social workers, representing 12% of 13,213 trainers (Brown & Schulze, 2008). Social workers also comprise the overwhelming majority of network providers specifically providing workplace trauma interventions. At the time of this writing, the network is composed of 11,235 social workers (representing approximately 75% of 15,532 total providers). Considering that this EAP is only one of literally hundreds of EAPs, the presence of social workers in workplace-sponsored programs is extensive. It is no surprise, therefore, that social workers play a major role in the response to routine workplace stress in general and to workplace critical incident stress in particular.

EAPs, Social Work and Routine Employee Stress. Today's workplace is increasingly unpredictable and stressful. Workers at all levels have little job security as corporations rely on downsizing and globalization. Healthy economic growth within a given industry no longer translates into secure jobs with adequate income or benefits. A significant number of workers, despite full employment, remain disadvantaged members of society. Ehrenreich's (2001) depiction of low level jobs makes the case that

employment, on its own, no longer protects from social and economic risks. Being employed does not guarantee one is appreciably better off than being unemployed. Millions of employed Americans struggle to maintain consistent income to remain above the poverty line (Hacker & Jacobs, 2008). The employed endure severe work stress, health challenges and housing and transportation difficulties, all of which contribute to family instability (Kantor, 1977). As government retreats from protecting workers from unsafe work environments and the inherent risks of capitalism, employee uncertainty and stress increase.

Psychosocial stressors exist routinely in the workplace (McFarlane & Bryant, 2007; Tesh, 1988). Examples include stressed manager-employee relations, peer conflicts, group morale problems, frustrating administrative procedures, multi-tasking, demanding workloads and deadlines, shift duties and inadequate resources. With employers seeking higher levels of productivity, there is reduced free time for personal and family needs. Several authors have investigated various factors associated with workplace stress (House, 1981; Karasek, 1979; Karasek & Theorell, 1990; Lerner, 1985; McGrath, 1970). Dewy (1991) reported 70% of workers state work stress caused frequent health and productivity problems and that 33% considered resigning from their jobs within the past year. OSW and EAPs respond with resources for provision of stress-management, prevention programs, stress education, intervention strategies (to relieve symptoms of stress) and environmental strategies (to generate social support structures to mediate the effects of stress) (NASW, 2008c). This a model for assessing *general* workplace stress results in practical interventions to ameliorate it (H. Perlman, 1982) and positions EAPs well to assist with *traumatic* workplace stress, a natural extension of their

role in supporting organizations. Workplace trauma can easily exacerbate pre-existing workplace stress.

EAPs, Social Work and Workplace Traumatic Stress. Social workers frequently take the lead in delivering workplace trauma interventions, seeking to restore organizational equilibrium (Akabas & Kurzman, 2005). As workplace trauma escalated through the 1990s (Antai-Otong, 2001), social workers were frequently front-line responders to trauma. As professionals staffing CISM units within EAPs, private practitioners delivering interventions or serving as mobilized members of agency response teams, social workers continue to play a leading role in trauma response (J. L. Bell, 1995). Social worker's qualifications for trauma services include provision of services within the client's environment, facility with crisis intervention, group skills, using education to empower clients to make informed decisions and employment of a social-environmental perspective (J. L. Bell, 1995; Schore & Atkin, 1993). The next section transitions to the social-environmental perspective of workplace trauma and discusses links between organizational context and organizational consequences of trauma.

Workplace Trauma and Organizational Resilience

The section reviews the literature on organizational outcomes following workplace trauma. It covers pre-incident organizational contextual factors, post-incident factors and then reviews organizational outcomes of workplace trauma. Outcomes cluster into several categories such as performance, retention, job satisfaction, attendance,

employee commitment to the organization and effects on organizational mission. The section closes with a review of studies linking organizational contextual factors to organizational outcomes.

Pre-Incident Organizational Factors

Moayed et al. (2006) and Burke (1999) note the importance of expanding focus from individual stress response factors to organizational, contextual factors and the role they play in both individual and organizational recovery. Pre-incident organizational factors encompass workplace characteristics, culture, management practices, work environment, employee relations, the nature of work and other factors. Contextual factors cited in the literature include time pressures, overly demanding tasks, degree of job autonomy and organizational instability (Moayed et al., 2006). Whether a workplace is prone to multiple critical incidents is an important contextual factor as well (McCullough, 2005). Murphy (1995) offers several categories of pre-incident organizational climate characteristics relevant to recovery from extreme stress. These include job factors (work hours, autonomy, pace of work, meaningfulness of work), role factors (level of responsibility, number of roles, role overload, role ambiguity), employment security, interpersonal relationships within workgroups, communication patterns and receptivity to employee input. Other examples include toxic work environments, role conflicts, employee-management conflict and disrupted coworker relations (Colligan & Higgins, 2005). Morris (2005) describes several organizational factors compounding stress and compromising retention. These include a culture that perpetuates blaming and views

using sick leave as manipulative. Griffeth and Hom (2000) add the organizational factors of perceived employer fairness, perceived job alternatives, satisfaction with adequacy of pay and benefits and employee satisfaction with their performance appraisal, are relevant to employee adjustment to workplace stressors. Bishop et al. (2006) note that a positive and supportive pre-incident workplace environment fosters resilience as much as do individual psychological attributes or family history. Colligan and Higgins (2005) note that counterproductive, organizational factors not only contribute to ongoing occupational stress, but also contribute to poor outcomes following workplace trauma. Bishop et al. (2006) cite the additional pre-incident organizational factor of organizational preparation for critical incidents. Griffeth and Hom (2000) agree and advocate for training for managers on the manifestations of traumatic stress, identification of individuals at risk and coordination of flexible schedules to increase manager understanding of resiliency. In summary, pre-incident organizational factors divide into existing cultural and environmental factors and specific organizational preparations for critical incidents.

Post-Incident Organizational Factors

Bishop et al. (2006) note while critical incidents impair workplace functionality, the impact can be significantly mediated by post-incident, organizational support. They note that a critical incident, as an environmental threat, may exhaust employee coping skills and therefore, organizations need to enhance environmental support to supplement depleted individual resources. Moayed et al. (2006) emphasize that post-incident, employers should avoid conflict of interest between employees' needs and business

needs, as this compromises recovery of both the employee and organization. Patton (2007) emphasizes delivery of practical assistance and social support, stating that *how* an organization handles a critical incident is as important as the nature of the incident itself or individual risk factors. Several authors argue that a supportive organizational climate is as important as the provision of clinical interventions in achieving post-trauma organizational recovery (Bishop et al., 2006; Richards, 1994; Stephens & Long, 1999). In addition to receiving direct support for symptoms, employees need to perceive that the organization is supportive or it can result in resentment, anger, increased stress-related illness and negative organizational outcomes. Exploring factors that contribute to perceived adequacy of organizational response is a central to this research.

Both Schouten et al. (2004) and Schat and Kelloway (2003) divide organizational supports into two categories: direct, instrumental interventions, comprised of practical assistance and indirect, informational interventions that impart information to support coping. Schouten et al. add that, faced with a threat, individuals naturally turn to social units with which they are most familiar and which represent safety and security — one of which may be the workplace. The presence or absence of anticipated support predicts for better or poorer organizational outcomes respectively.

Lazarus and Folkman (1984), Moayed et al. (2006) and McFarlane and Bryant (2007) emphasize a critical contextual factor in post-incident workplace stress is the early and adequate response of management, specifically, whether a manager identifies stress and intervenes by altering working conditions, removing obstacles (work overload, lack of autonomy) and empowering employees. After a traumatic incident, visible supportive management gestures and empathetic listening reduce the intensity of impacts (Richards,

1994). Griffeth and Hom (2000) found the extent to which employees judge a manager competent and genuinely concerned about their welfare affects employee perceptions of the organization, which predicts for various organizational outcomes, especially for retention.

Researchers found that *perceived* organizational support mitigates stress. Employees who feel supported have fewer negative outcomes. Perceived support may be more important *than the actual level of support offered* (Snow, Swan, Raghavan, Connell, & Klein, 2003). Other key post-incident perceptions include job satisfaction and satisfaction with working conditions or benefits (Dollard, Skinner, Tuckey, & Bailey, 2007; Farrell & Cubit, 2005; Schouten et al., 2004). Morris (2005) and McCullough (2005) identify employee and manager perception of the effectiveness of interventions and of satisfaction with their organization's response as key post-incident factors. Graen (1977) cites perceived relevance of work to the employee's future, a perception which can be altered by a critical incident. See Appendix A: Post-Incident Organizational Factors, for a summary of variables identified in the literature, presented in three overarching groupings – organizational contextual factors, employee perceptions of the organization and workgroup symptoms.

Organizational Outcomes of Workplace Trauma

Several negative performance-related outcomes hinder organizational recovery. They include reduced productivity and neglecting job responsibilities (Burke, 1999; Farrell & Cubit, 2005; McCullough, 2005; Schouten et al., 2004), diminished intrinsic

work motivation (Janssen, Jonge, & Bakker, 1999), whether employees returned to prior functioning (McCullough, 2005) and quality of work (Martin, 2008; Schouten et al., 2004). Several formal employee relations impacts can derive from workplace trauma - worker compensation claims (Dollard et al., 2007; Farrell & Cubit, 2005), employee litigation (Farrell & Cubit, 2005; Schouten et al., 2004), anti-discrimination lawsuits (Moayed et al., 2006) and increased employee grievances (Moayed et al., 2006).

Several outcomes reflective of eroding employee engagement are critical to organizational recovery. These include increased *absenteeism and sick leave* (Burke, 1999; Dollard et al., 2007; Farrell & Cubit, 2005; Martin, 2008), *resignation* (Farrell & Cubit, 2005; Griffeth et al., 2000; Janssen et al., 1999; Martin, 2008; McCullough, 2005; Schouten et al., 2004) and *burnout* (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Dollard et al., 2007; Janssen et al., 1999). Demerouti et al. (2001) elaborate on burnout as involving exhaustion, depersonalization and disengagement, all of which are influenced by work environment and can be exacerbated by workplace trauma. Organizational assimilation and similar concepts such as connection to work, organizational commitment and loyalty are also vulnerable to deterioration following workplace stress (Burke, 1999; Dollard et al., 2007; Graen, 1977; Schouten et al., 2004). McCullough (2005) adds two other engagement factors - whether employees transfer out of the work group or take a leave of absence. Barry (2008) notes that resignation is particularly disruptive to organizational functioning. Boyle and Miller (2008) add that resignation disrupts staffing, hinders performance and compromises work quality. In addition, resignation creates increased work stress for retained employees. Appendix B - Organizational Outcomes of Workplace Stress presents a consolidated list of organizational outcomes organized into

the areas of performance, legal/economic impacts, engagement, and effects on organizational mission.

Studies Linking Organizational Context, Workplace Response and Outcomes

Noblet et al. (2006) found that both internal, individual variables (i.e. employee risk factors and responses) and external, contextual variables (i.e. organizational traits and responses) made significant contributions to variations in three dependent variables - psychological stress (an individual outcome) and job satisfaction and organizational commitment (organizational outcomes). Several organizational contextual factors listed above, such as management practices, toxic work environments, employee relations, overly demanding tasks, job autonomy, employment security and organizational preparation for critical incidents, predicted for job satisfaction and preserved organizational commitment, which have been shown to link to retention vs. resignation.

Noblet confirmed in particular that management behavior (rewarding versus unrewarding) contributes significantly to both individual stress levels and organizational commitment. Compared to individual psychological factors (i.e., coping styles, personality traits), external resources (organizational context and responses) explained a larger amount of variance in outcomes, suggesting that more attention needs to be paid to post-incident organizational context (Noblet et al., 2006).

Snow et al. (2003) found that psychological symptoms are influenced by the interplay of individual factors and organizational, protective factors. They studied avoidance as a coping strategy, which reduces initial symptoms but is ineffective

longitudinally. Snow et al. found work-based, social support an important contextual variable that influences the individual's utilization of *active* coping strategies (non-avoidant). Snow identified two mechanisms of work-related social support fostering active coping. First, supportive problem-solving assistance offered by others models for the individual the same strategies they need to use for themselves. Second, workplace support favorably influences employee perception of stress and threat, thereby reducing the likelihood of negative outcomes

Social workers, as employees and members of organizations, are no less at risk for workplace trauma. In fact, Morris (2005) states they may be more vulnerable due to the values of the profession – such as the primacy of assisting the client. Morris studied reduced social worker commitment to agency following severe work stress. Morris found organizational context mediates employee and supervisor perceptions of the effectiveness of organizational response, which predicts for organizational commitment and resignation. Morris also found that inadequate organizational response fosters panicked decision making, which associates with resignation. In summary, the ways in which organizations respond to employee stress affect whether an individual continues at work, returns (if temporarily absent) or resigns (Morris, 2005).

This analysis of contextual organizational factors and organizational consequences associated with these variables serves as a frame of reference in which to review various theories applicable to workplace trauma, which offer explanatory and predictive models for organizational resilience.

Theoretical Models Relevant to Workplace Trauma

This section surveys theories relevant to organizational resilience following workplace trauma. Theories divide generally into “appraisal theories” and “contextual theories”. Appraisal theories are psychologically oriented theories focusing primarily on individual reactions and responses, risk factors and mediating processes by which individuals “appraise” the nature of a threat and engage their varying capability to respond to its external demands. Appraisal theories include stress theory, psychodynamic theory, cognitive behavioral theory, crisis intervention theory, the triple vulnerability model and the transactional model of stress response. When applied to interventions in a traditional clinical practice setting, these theories contribute much towards therapeutic effectiveness. However, while appraisal theories inform organizational interventions, generally they are of limited utility in understanding organizational resilience. For reference, Appendix C, Appraisal Theories, summarizes several appraisal theories. This section instead reviews relevant contextual theories, with one exception. Individual resilience theory links to organizational resilience in important ways and therefore merits some discussion first.

Resilience Theory

To summarize assertions related to individual resilience articulated previously, first, the more positive are various mediating influences, the more resilient is the individual employee and by extension, the workgroup and the organization. Second,

certain individual traits associate with resilience (Charney, 2003; Graves et al., 2005; Kobasa et al., 1982; Salovey et al., 1995). Third, resilience is learnable (Bonanno, 2004; R. Newman, 2005). Less prevalent in the literature is discussion of how contextual factors interact with individual stress and resilience. For example, socio-cultural aspects of age, race, gender, ethnicity, economic status and various environmental factors may interact with and affect individual traits, cognitive interpretations of events (appraisal) and even neurobiological processes. Organizational context, therefore affects both individual and organizational resilience, which may predict for various organizational outcomes.

Contextual Theories

Lepore et al. (1996) site the importance of environmental support. Schmidt and Andrykowski (2004) state, despite individual treatment, stress levels remain elevated when individuals are unable to discuss thoughts and feelings in a supportive context. Kim & Diamond (2002) argue that contextual-organizational conditions facilitate resilience at all levels. Since resilience is learnable, organizations can promote resilience through various means. These include resiliency training, ensuring a supportive context and providing effective CISM interventions. In theory, the more an organization attends to contextual workplace issues pre and post incident, and the more successful is CISM support, the more likely employees will demonstrate resilience and the more positive will be organizational outcomes.

Social Work Theory

While there is no specific social work theory addressing workplace trauma, available generic social work theory is directly relevant. A core principle of social work is the concept of "person-in-situation" (Hamilton, 1950). Reynolds (1951) articulated the concept further by defining clinical social work as addressing individual's social relationships and adaptation to environment. Reynolds contributed much to contextual practice by the manner in which she integrated micro and macro dimensions (C. Caplan, 2002). Building on these principles, Perlman (1957), advocated for a "person-problem-place-process" approach to problem-solving. These theories and the psychosocial perspective (Hollis, 1964) later informed system's thinking and ecological viewpoints (Germain & Gitterman, 1980). A psychosocial or biopsychosocial perspective of critical incidents ensures there is not a predominant focus on individual psychological states, personal liabilities (risk factors) and individual treatment at the expense of social, environmental and organizational factors.

Social work theory, rather than a fixed or one-dimensional theory, is dynamic, embracing diverse views (M. Payne, 2005). Theoretical diversity allows social workers the flexibility of incorporating the orientation or combination of orientations that best suit objectives, practice conditions, specific client populations and circumstances. This aligns well with the multi-dimensional problem of workplace trauma. Payne suggests three, key dimensions of social work theory – the reflexive-therapeutic dimension, the socialist-collectivist dimension and the individualist-reformist dimension. CISM situates within all three. It reflects an individualist-reformist dimension by supporting the workplace social

order via helping workgroups lessen anxiety and recover from workplace trauma. However, when occupational social workers simultaneously seek to influence workplace environments and organizational contextual factors in favor of workers, they operate, to some degree, within the socialist-collectivist dimension. CISM practice reflects elements of the reflexive-therapeutic dimension as well, such as working with employees in a manner that incorporates their values, input and preferences in their adaptation to work environments.

Trauma as a Psychosocial Phenomenon. The Greek philosopher, Epictetus said, "People are disturbed not by things, but by the views they take of them" (Pulley, 2005, p. 1). Epictetus also stated, “On the occasion of every accident that befalls you, remember to turn toward yourself and inquire what power you have to put it to use” (D. Paton et al., 2003, p. 3). Both statements portray stress as a psychosocial phenomenon. Trauma, it seems, lies in the eye of the beholder and, just as importantly, within the context of the beholding. Several social work authors define trauma psychosocially (Black et al., 1993; Carlton & Stephenson, 1990; Heggar, 1993; Moonilal, 1982). Trauma, viewed psychosocially, is the result of an interactive, mediating process between event, environment and person.

Psychosocial Aspects of Work Post-Trauma. Work is the doorway into American culture. When that door is closed, it blocks access to essential emotional, social and economic benefits. Psychologically, work is a central organizing factor for most adults and critical for identity, satisfaction, meaning, purpose and self-esteem (Hochschild, 1997; Schouten et al., 2004). Disengagement from work, absenteeism or resignation can lead to depression, anxiety, family disruption and health problems (Akabas & Kurzman,

2005; Lerner, 1980). Socially disenfranchised or alienated employees lose contacts, daily structure and a sense of interrelatedness. Community life often revolves around work (Kurzman & Akabas, 1993). With job loss (whether from resignation or firing), economic losses extend beyond salaries and wages. Employees lose access to numerous financial resources, including key federal entitlements such as unemployment insurance, workers compensation, Medicare and Social Security. Employers also offer voluntary benefits including health insurance, paid vacations, pensions or retirement savings accounts, educational reimbursement, daycare subsidies, child and elder care resource assistance, employee assistance services and other benefits, all of which are provided at no or reduced costs. Beyond these psychological, social and economic benefits, work has potential therapeutic benefits.

Therapeutic Benefits of Work Post-Trauma. The workplace, while potentially a the source of traumatic stress, can also be a therapeutic environment for those suffering from it (Bolton et al., 2004). While one could argue that it is empowering to encourage a worker to leave a job that was a source of trauma, it is also important to consider that remaining on the job and facing the source of the trauma could be beneficial. While workers often find it difficult to return to employment associated with a workplace trauma, mastering avoidance fears while working within the same environment reduces distress. By experiencing previously avoided situations, the employee regains a sense of self-control often shattered by a critical incident. Additionally, work ensures regular social contact, counteracting the tendency to isolate. Support from co-workers who experienced the same incident validates feelings and thoughts and provides useful information on other's coping strategies. Finally, regaining mastery decreases depression

(Bolton et al., 2004). Alternatively, avoidance of the work site and job loss are associated with increased psychiatric distress (Feehan, Nada-Raja, Martin, & Langley, 2001). Not least among the benefits of preserving connection to work is continued access to occupational social workers. In summary, social work theory contributes much to understanding the impact of critical incidents and informing practice in the areas of workplace stress prevention and CISM services.

Conservation of Resources Theory

Historically, theorists viewed stress alternatively as a contextual, environmental issue or an internal, psychological phenomenon. Integrating them, Hobfoll (2001) positions his conservation of resource (COR) theory within the context of "individual-nested-in-family and family-nested-in-tribe". Hobfoll (2001) argues that attempts to study any single part of this interactive system leads to limited predictive capacity (a description consistent with social work's ecological and biopsychosocial perspectives). Hobfoll (2001) argued that traditional stress theory lacked predictive capability because it concerned itself more with reactions. In addition, Hobfoll argued that individual, appraisal-based, idiographic theories overemphasize *personal* processing of stimuli and are not transactional enough. For example, the "stress-appraisal-strain-coping" model (Lazarus & Folkman, 1984), defines stress in terms of individual perception only, ignoring objective, external demands and is therefore, according to Hobfoll, too reactive. COR instead emphasizes the nature of one's environment, both objective (e.g., actual resources) and socially constructed (e.g., perceived access to resources). COR cautions

that an over emphasis on individual appraisal ignores the degree to which culture scripts, constrains and determines personal appraisal. Hobfoll argues that while neurobiology and learned responses condition personal appraisal, appraisal always embeds within a social context, which ultimately determines it. This positions COR theory as particularly explanatory for organizational resilience following critical incidents. Organizational context both constrains employee response and is in turn, influenced by those responses.

COR theory posits the essence of stress is resource loss – losing, or being fearful of losing, what is of value, including personal characteristics or social conditions that protect what is of value. Stress occurs when resources are threatened, lost or believed to be unstable due to the perceived inability to protect resources. COR holds four basic tenets. First, individuals disproportionally attend to resource loss over resource gain. Individuals ignore their strengths and overestimate the duration and intensity of stress and loss. Resource loss predicts for anger, depression and PTSD (Ironson et al., 1997).

Second, to protect resources, recover from losses or gain resources people *need resources*. Those with greater personal, social and economic resources are therefore less vulnerable to stress. Interventions aimed at enhancing a subjective sense of control without building external resources have little influence on resiliency. Interventions targeting both subjective control and contextual support enhance resiliency (Freedy & Hobfoll, 1994). COR theory explains organizational consequences of workplace trauma related to employee performance, disengagement, burnout or resignation. These outcomes are understandable as a failure to gain resources or to perceive adequate resources following significant resource loss.

Third, loss of resources fosters further resource loss. The advantaged (wealthy, non-stigmatized groups) will therefore cope better than those who lack resources or those who cannot further risk resource investment because they have so few. Therefore, the poor, the aged, minorities, disabled and other marginalized groups may engage in reactive coping (minimizing resource loss), which precludes dedicating resources to proactive coping (increasing resources). Hobfoll argues that trauma research should not be limited to reactive responses of groups. Proactive resource gains allow for *proactive coping.* Groups proactively cope by acquiring resources, acting early on warning signs of loss and positioning themselves in a social context with the most resources. Hobfoll labels proactive coping as the "missing link" in trauma research.

Fourth, those lacking resources tend to withdraw and adopt defensive postures to conserve resources. Traumatized employees with few resources employ denial, avoidance and withdrawal and are more likely to develop PTSD (Hobfoll, 2001). Employee behaviors following critical incidents suggest they are reacting not only to the incident but also to the challenge of countering loss of resources and managing new demands with depleted resources.

These tenets of COR have important implications for organizational resilience. Following threat, employees focus on *objective* circumstances first, not *personal* psychological strengths and weaknesses. Organizations that ignore contextual support while pursuing individual symptom reduction engage in a form of blaming behavioral dysfunction on employees, rather than the event or inadequate support immediately following a critical incident. Work environment post-incident that supports resource gain is as critical to recovery and organizational outcomes as is individual treatment. This

requires removing obstacles to adaptation and altering environments to provide resources that retain engaged and effectively performing employees (Hobfoll, 2001).

Demand, Control, Support Theory

Demand, control, support (DCS) theory articulates well the development of stress within work environments (Tansey, Mizelle, Ferrin, Tschopp, & Frain, 2004) and the relationship between individual employee and organizational context (Karasek & Theorell, 1990). The three factors, demand, control and support, and their interaction shape employee's perceptions of stress (an appraisal component). As external *demands* increase, stress increases. If the level of stress increases beyond an individual's ability to cope, the person develops distress. The degree of personal *control* (autonomy) also links to stress level. Without control and autonomy, events often surpass individual coping ability and impact performance and engagement. *Support* consists of the level and type of assistance provided by the organization. Demand and support are contextual factors. Critical incidents make extreme demands on employees and since they typically involve a loss of control over events, environmental support becomes critical. In DCS theory, work environment, immediately following an incident is as relevant as individual factors. Contextual factors promote either immunity or vulnerability to stress by enhancing the employee's strengths or exacerbating limitations.

Social Embeddedness Theory

Potentially, crises increase or impede social support (Kaniasty & Norris, 1995). Kaniasty and Norris (1993) studied the stress-mediating potential of different types of social support in the context of critical incidents. The authors observe that the principal assumption of most trauma models is that stress and social support are unrelated to each other and that research has ignored the link between stressors and support or more specifically, between stressors and *expectation of support*. Kaniasty and Norris (1995) distinguish among three categories of support – 1) received support (level of support actually provided), 2) perceived support (level of support the person *believes* will be available) and 3) social embeddedness (the quantity and type of relationships one has with others). Following an incident, these three support factors associate with different phases post-incident. Received support normally is associated with the immediate aftermath of the event, perceived support and social embededness operate after the event. The authors argue that following trauma, expectations for support run higher than the amount of support actually received. Research that addresses the degree of perceived support following workplace trauma will be informative. This research explores various factors as predictors of perception of organizational support as an organizational outcome.

Context Theory

Developed by Bacharach and Bamberger (2007), context theory explores the consequences of involvement in a critical incident. They argue that "support and control climates", defined as situational opportunities and constraints, affect organizational stability. While individual attitudes, cognitions, and behavior are important, they vary depending upon the structures, processes, and norms present in the social context in which they occur. Bacharach and Bamberger argue that favoring individual perceptions over contextual group and organization-level factors, neglects the critical role context plays. To neglect context commits what they call a "psychologistic fallacy" - assuming that individual-level outcomes can be explained exclusively in terms of individual differences. Moreover, an emphasis on individual factors predisposes practitioners towards individual interventions, most of which are unfeasible or of limited utility in the workplace immediately following workplace trauma. To ameliorate negative impacts quickly, managers and organizations need practical, easy to implement, and sometimes, large-scale solutions. Given that critical incidents are by definition unpredictable and that practitioners intervene *after* event occurrence, within the organizational context, identifying post-incident contextual conditions that contribute to organizational resilience has substantial value (Bacharach & Bamberger, 2007). Post-incident factors may have stronger effects on reactions than pre-incident factors or even those concurrent with the incident itself (Emsley, Seedat, & Stein, 2003). There are two additional reasons to look beyond individual differences to workgroup level context. First, individual stress-related perceptions are at least partially a function of the group to which these individuals

belong. Second, social context, by shaping social interaction, significantly affects both the degree to which an incident is interpreted as traumatic and how individuals respond to stressors (Bliese & Jex, 2002).

Chapter Two

Research Methodology

This chapter first classifies variables in the literature into phases relative to the sequence of events surrounding a critical incident – pre-incident, incident characteristics, service delivery and organizational outcomes. Next, it reviews the research purpose and provides a methodological overview. It then presents a rationale for this practice-based study and for conducting the research within a particular employee assistance program. A subsequent section describes the research setting, an exemplar CISM unit, its structure, services and data collection procedures. Following sections detail data screening procedures and note how various data problems were identified and managed. The chapter then provides an overview of the database and describes how data was extracted and combined into a single dataset. The next section states the research proposition guiding the bivariate analyses. The chapter closes with a discussion of clinical data mining and the limitations, and advantages of non-controlled studies.

Classification of Variables in the Literature

The approach to analyzing potential relationships between independent and dependent variables in the CISM database was informed by several influences. First, the literature review in chapter one identified several predictor and organizational outcome variables following workplace trauma. Second, I perceived that these variables organize into four critical incident phases, variable groupings related to the temporal sequence of events preceding an incident, occurring during the incident, taking place after the incident

and resulting in eventual organizational outcomes. Third, this variable classification scheme aligns with specific types of research variables - antecedent, independent, intervening and dependent variables. See Table 3: Classification of Research Variables. of four based on the sequence of events relative to an incident - pre-incident, incident related, service delivery and organizational outcomes.

Table 3: Classification of Research Variables

	Incident Phase		**Variable Type**
Predictors	Phase One	Pre-Incident	Antecedent
	Phase Two	Incident-Related	Independent
	Phase Three	Service Delivery	Intervening
Outcomes	Phase Four	Organizational Outcomes	Dependent

Fourth, several variables contained within the CISM unit's database fall into these variable groupings. CISM database variables include prior workgroup trauma as the only *antecedent, pre-incident variable. Independent*, *incident related variables* include type of industry, type of incident and incident severity. *Intervening*, *service delivery variables* include initial organizational acceptance of on-site services and implementation of on-site groups, individual sessions, management consultations and follow-up services. Finally *dependent, organizational outcome variables* include workgroup performance restoration, employee retention within the organization, employee retention within the affected workgroup, sustained employee attendance, services helpfulness for employees and management and the perceived adequacy of organizational response to the event.

These outcome variables all represent operational components of the concept – organizational resilience.

Research Purpose and Methodological Overview

The purpose of this research is to explore predictors for organizational resilience following workplace trauma in the specific areas of employee retention, attendance and performance, helpfulness of services for employees and management and perceived adequacy of organizational response, as achieved by a specific EAP's CISM unit. The unit of analysis is workgroups experiencing workplace trauma. The programs' available data allows for univariate, bivariate correlational and multivariate regression analyses. To characterize the research, it is formative, retrospective, practice-based and employs the methodology of clinical data mining. It examines a single program setting and relies on pre-existing and available agency data (Shyne, 1960). The selected agency setting provides a unique opportunity to examine empirically several relationships noted in the literature while simultaneously providing relevant and immediately usable information to the program's administrators and staff. Additionally the study contributes to workplace trauma practice within the fields of social work, occupational social work, employee assistance programs and critical incident stress management. Beyond these directly relevant fields, the study may also inform activities and future research in the related fields of disaster mental health, industrial-organizational sociology, industrial-organizational psychology and occupational health nursing.

Rationale for an Agency-Based Study: An Employee Assistance Program

This research setting is a single, national employee assistance program (EAP). During the three-year period studied (2006 – 2008) the EAP served over 1,400 client organizations. Over 43 million individuals (one out of every six Americans) were eligible for its services. During this three-year period, the EAP's CISM unit collected limited data on 9,678 critical incidents but very comprehensive data on 5,181 incidents.

This EAP provided an ever expanding menu of workplace support services, confirming Kurzman's (1993) prediction that EAPs will continue to evolve to meet the changing needs of workers and work organizations. Domestically, services provided to public and private employers include management training and consultation, employee assessment, short-term treatment and referral, employee training programs, legal counseling and referral, financial consultations and referral, dependent care services, geriatric case management, disability management, disease management and health and wellness coaching. Related military programs serve the Department of Defense, states, military organizations and defense contractors, offering coaching for the armed forces in all branches and civilians facing re-adjustment challenges after war zone exposure. Screening assessments for PTSD, traumatic brain injury and related war zone conditions are included. International EAP services serve American expatriates, foreign nationals (working within their country) and foreign expatriates (working outside their country of origin). Finally, the EAP's specialized CISM unit provides services that directly address workplace trauma, domestically and internationally.

This prominent CISM unit's available program data allow for a study that contributes to the literature on organizational resilience to workplace trauma while situating within a practice-relevant setting and addressing a growing area of social work practice. This CISM program is an exemplar from several perspectives. In the field of workplace trauma, the unit is the most experienced and largest of its kind. Further, the unit maintains a database that is unprecedented in its size and potential for clinical data mining. Therefore, a single setting study, conducted within this particular CISM unit is an ideal approach to exploring workplace trauma and its impact on organizational outcomes.

The Research Setting: CISM Unit Structure, Services, Procedures and Data Collection

The unit consists of three teams – an intake team, a coordination team and a follow-up team. Additionally, two data managers maintain the unit's databases and program data queries on data collected. See Appendix H: Data Collection Procedures.

Intake Team. An intake team receives requests for critical incident support from organizational requestors such as site managers, medical directors, human resource managers or union officials. They record general information, including the name of the organization, the caller's name, date of the incident and the state or international location of incident. Intake staff conducts an incident assessment, gathering details of the incident and identifying stated needs and expectations of the caller. Staff also assesses workgroup characteristics, history and composition. The intake staff opens the incident in the database and offers immediate telephonic guidance and consultation on overall response strategy, consistent with the multiple components of CISM, reviewed in chapter one.

They then deliver supportive and educational materials to the worksite. Intake staff also inquires whether the organization desires *follow-up services* post- incident. Follow-up services include continuing telephonic consultation to management, support for employees, tracking developments in the aftermath of the incident and monitoring organizational recovery and outcomes. Follow up allows staff to collect extensive information related to the incident, the workgroup, services provided and organizational outcomes. If the organization desires such services, staff identifies an organizational follow-up contact or site observer and records their contact information.

Coordination Team. The intake team hands off the incident to a group of CISM Coordinators. For all incidents, coordination staff offers *on-site services*. On-site services include group sessions, individual sessions and/or management consultations. Coordination staff document whether the organization accepted on-site services and if implemented they record the number of each service provided (groups, individual sessions, management consultations). These data allow for computing a dichotomous variable for each, *whether* the organization implemented groups, individual sessions, management consultations and an additional variable – whether an organization implemented at least one on-site service.

Follow-Up Team. For those organizations *accepting* follow-up services (N = 5,181), a dedicated follow-up team assumes responsibility to provide them and collect extensive information through three follow-up phases. Staff offer and deliver follow-up services regardless of whether the organization accepts *on-site* services noted above or declines them. *Follow up data* (such as incident characteristics, satisfaction with services,

outcomes, etc.) are collected from all organizations agreeing to receive follow up calls - including those who accept and those who decline on-site services.

Follow up - phase one data collection, at two days post-incident, starts with an inquiry into whether a previous traumatic incident affected the same workgroup. “Has the same group of employees experienced any other traumatic events in the past 12 months?” Staff records “prior workgroup trauma” or “no prior workgroup trauma”, as a dichotomous variable. Next, staff asks about perceptions of performance restoration to levels before the incident (Time 1) on a Likert scale. “Would you agree or disagree that employees have returned to the same level of functioning as before the critical incident?” Also at two days post-incident, staff inquires about the site observer’s perception of how helpful the services were for employees and for management, recorded again on a Likert scale. “How helpful were on-site services to employees?” “How helpful were on-site services to management?” Finally, staff records completion or non-completion of phase one follow up (Time 1), a dichotomous variable.

Follow up - phase two data collection, at four weeks post-incident includes whether *subsequent* workgroup trauma occurred (Time 1) as a dichotomous variable. “Since the original event, have these employees experienced any other traumatic events?” Next, staff makes a second inquiry about workgroup performance restoration (Time 2). Additionally, staff surveyors ask three attendance-related questions. They inquire about resignation, transfers out of the workgroup and extended leaves of absence (Time 1, dichotomous variables). The questions are: “Have any employees resigned because of the critical incident?” “Have any employees transferred because of the critical incident?” “Are you aware of any attendance issues such as disability, leave of absence, FMLA,

lateness, etc.?" Per program procedures, there are also three survey questions to address workgroup atmosphere (Time 1). "Sometimes change occurs following a crisis. I would like to ask you about common changes employees may experience. Please tell me if you have noticed a change, whether positive or negative, in the employees affected by this event in the following ways. Interaction with coworkers? Interaction with management? Workgroup morale?" The choices are reported on a Likert scale (positive to negative) with a mid-point of "no change". Protocol also calls for eight questions assessing employee symptoms of post-traumatic stress (Time 1). "Sometimes change occurs following a crisis. I would like to ask you about common changes employees may experience. Please tell me if you have noticed a change, whether positive or negative, in the employees affected by this event in the following ways: Irritability or anger? Anxiety? Sadness? Concentration? Startle response? Avoidance of reminders? Hyperawareness of surroundings? Ability to perform routine functions?" Responses are again recorded on a Likert scale with a mid-point of "no change". Staff inquires additionally about the observer's estimation of the adequacy of their organization's overall response to the incident and records the response per a Likert scale. "How satisfied are you with your organization's response to this event?" Finally, staff records whether they completed follow-up assistance at phase two (Time 2, dichotomous variable).

Follow up - phase three can occur at eight weeks, but is contingent on incident severity and staff judgment regarding the need for the additional follow-up. If conducted, staff inquires about subsequent workgroup trauma (Time 2), resignations (Time 2), transfers (Time 2), extended absences (Time 2) and workgroup performance restoration

(Time 3). Per procedure, staff is also to inquire further about workgroup atmosphere, Time 2 (co-worker interactions, employee-manager interactions, morale) and the eight employee symptoms of post-traumatic stress (Time 2). Finally, staff record whether they completed follow-up phase three assistance (Time 3).

Data Screening and Management

Prior to identifying which of the above variables would be extracted for analysis, several test queries of the data were conducted, revealing that several variables of interest presented data problems. The next section details strategic decisions made regarding data management. Data challenges and their resolutions are summarized.

Incident Duplication from Partial Follow-Up. Examining the unit's database year-by-year revealed incidents are included or excluded from specific data years based not on their date of occurrence, but on the date follow-up was conducted. Therefore, when follow-up occurred across years, incidents were duplicated in the database. This problem was managed by using SPSS to identify duplicate incident numbers, determining which of the pair had the incomplete information and then deleting that incident.

Incident Duplication from Multiple Service Dates. It was also observed that incident identifiers (i.e. incident #10001) with multiple dates of service were duplicated for each date of service. If incident #10001 had four dates of service, incident # 10001 showed four times. This also duplicated associated variable data and counts, such as the number of criminal acts as an incident type. If incident # 10001 was a criminal act, it showed four times, inflating the count for criminal acts. The solution was to run the query

with only incident date, without date of service as a field, which de-duplicated events *and* variable counts, without losing variable data associated with a specific incident. While date of service was initially of some interest, the strategic decision to eliminate it ensured data extraction reliably captured more critical variables.

Counts of Service Types: Duplication from Multiple Service Dates. Also for events with multiple dates of service, it was observed that total services counts over *all* dates related to a single incident showed with *each* date of service, inflating the types of service counts. Running the query by incident date only, as above, without date of service, de-duplicated the service totals for types of services delivered, while preserving the accurate service totals for the incident. Separate totals for services delivered on a specific date of service were not available in the data.

Data Integrity Issue: Subsequent Trauma. While survey protocol calls for collecting at four and eight weeks (Time 1 and Time 2) whether a subsequent traumatic incident occurred, test data anomalies indicated staff inconsistently interpret how to enter the data at the two timeframes. This result is that data are unreliable for whether a subsequent incident occurred specifically within the four-week follow up or the eight-week follow up (Time 1 or Time 2). Applying a rule to the query such that the two fields merge into a third data field - simply "Subsequent Trauma" allowed for an accurate one-time measure – whether a subsequent incident occurred at some point between the initial incident and the eight-week follow-up. However, for the new variable totals, there were so few workgroups with a subsequent trauma (144, only 4.2% of workgroup incidents), it was decided to eliminate subsequent trauma from the analysis.

Database Malfunction: Resignations, Transfers and Leaves. In a test query, it was apparent that for these measures, the database program is not functioning as intended. I discovered that if staff enters an eight-week response, it overwrites the four-week data. For incidents with no 8-week follow-up data entry, the 4-week data remains accurate. This precludes comparing results at four-weeks and eight-weeks or comparing either with outcomes. The solution to this threat to internal validity was to treat these variables as one-time measures. While the original data inaccurately indicate whether resignation, transfer or extended leave occurred at either four or eight weeks, the corrected data portrays accurately whether a resignation or a transfer or leave occurred at *some point* between the incident and follow-up.

Inaccuracy of On-Site Service Measures. While the variables reflecting the *number* of services implemented are of interest descriptively, on their own they are not instructive in bivariate or multivariate analysis. Organizations range in size from a few hundred employees to several hundred thousand employees. Therefore, without controlling for the effect of organizational size, any findings of association between the number of various services implemented and other variables would be problematic. By virtue of size alone, very large organizations may implement services in greater numbers whereas small employers may implement fewer. While a ratio variable could have controlled for this analytic problem, the database does not contain information on the number of employees associated with organizations accessing critical incident services. Inquiry was made into whether organizational population data could be extracted from the agency's general data and matched to the CISM database. The programming and staff resources required to implement the project precluded proceeding with an attempt to

compute the ratios. Therefore, the dichotomous versions – whether the organization implemented each or at least one of the on-site services was used in the analyses.

Cell Frequency Violations. Preliminary Chi Square Cross Tabulations run for ordinal outcome variables (workgroup performance restoration at two days and four weeks, service helpfulness for employees and management and perceived adequacy of organizational response) revealed multiple violations of cell frequency requirements. In order to allow for valid bivariate testing, these variables were transformed into dichotomous versions.

Data Not Extracted. Due to irresolvable threats to internal validity, I did not extract the data for the following variables, eliminating them from analysis. Three variables related to workgroup atmosphere were not extracted (workgroup morale, co-worker interactions and interactions with management). Eight workgroup symptom measures were also not extracted (irritability, anxiety, sadness, concentration, startle response, avoidance, hyperawareness and functional ability). For both sets of data, workgroup atmosphere and workgroup symptoms, test data revealed only the mid-point, default Likert value - “no change” recorded at both four and eight weeks post-incident, yielding no useable variation on which to base an analysis. Apparently, staff is either not collecting this information or not entering it.

Also not extracted due to data issues is total service hours provided per incident and the profession of on-site providers. For both variables, data were unreliable. Total service hours, based on provider billing is compromised by inclusion of travel time to and from incidents, which inaccurately inflates the hours of actual service time on-site. For

profession of providers, the inconsistent use of credentials precluded an accurate identification by profession.

Whether follow-up services are provided is of interest. However, while data for follow-up at two days and four weeks is accurate and useable, data for follow-up at eight weeks is excessively skewed (93% not completed, 7% completed). This is likely related to procedure, allowing for follow-up at eight weeks as contingent on incident severity and staff judgment regarding the need for the additional follow-up. Follow-up at eight weeks is excluded from analysis.

Finally, the dependent variable of workgroup performance restoration at eight weeks had excessive missing date (93% of workgroups), most likely again related to the fact that follow-up at eight weeks is seldom conducted. This variable is also eliminated from analysis.

In summary, to resolve threats to reliability and ensure valid statistical testing, the above transformations of some data into dichotomous versions results in reducing desired variability and the elimination of several variables of initial interest altered the direction of the research in important ways. However, despite these limitations, multiple, reliable independent and dependent variables were extracted accurately and are available to support a credible analysis. This represents a retrospective approach to validity and reliability (as opposed to a prospective research design addressing validity and reliability in the beginning) as well as strategic compromise between preferred approaches and what is feasible (Epstein, 2009). Figure 2, CISM Program Schematic, depicts the entire program service flow and details useable data (in its transformed versions) generated at the various service delivery points by the various teams.

Figure 2: CISM Program Schematic

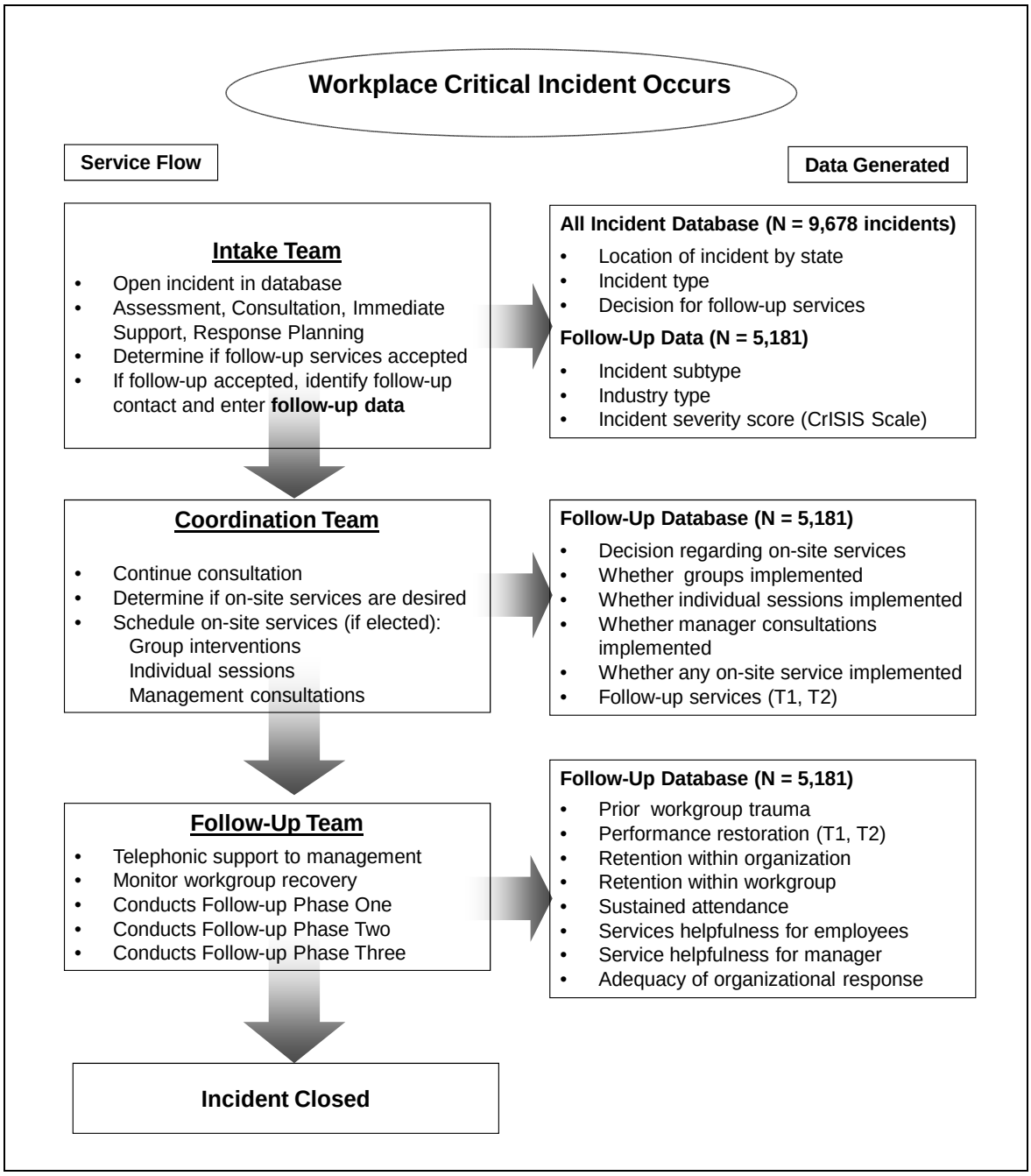


Figure 2 demonstrates that through its provision of services the unit generates a significant amount of practice data with considerable potential for analysis. Equally remarkable is the fact that until the present study, limited large-scale analysis of the

available data has occurred. The next section provides an overview of the databases.

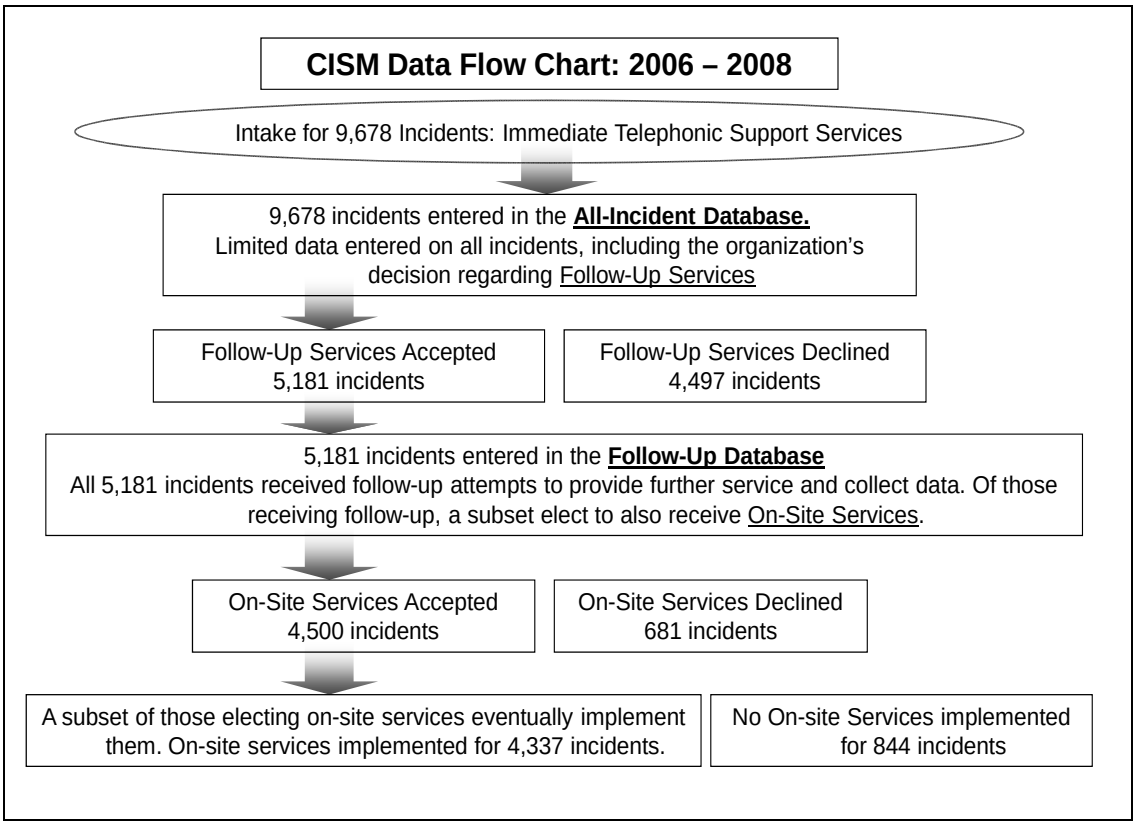
Overview of the Data

Each year, the CISM unit receives calls for assistance with thousands of workplace critical incidents and assists employers in responding to personal and workplace disruption that ensues. While collecting extensive data since the early 1990s, the unit did not establish consistent survey and data-collection procedures until 2006, which it followed consistently throughout 2007 and 2008. In addition to consistency in data collection procedures, the program environment was also very stable during these years. There were no major changes to services or client organizations. Therefore, selecting data for analysis from these three years avoids confounding variables (Epstein, 2009).

As illustrated in Figure 2, the CISM unit houses two databases, an *all-incident database* and a *follow-up database.* The all-incident database includes only three data elements: incident location, incident type and whether the organization accepted or declined follow-up services. However, these data do not integrate, cross-reference with nor link to each other by incident and workgroup. Only separate, frequency distributions for each data element are available for these data elements. The follow-up database however houses multiple useable variables, each of which aligns with one of the four types of variables noted in Table 3 and targeted for analysis. In contrast to the all-incident database, the follow-up database integrates completely, allowing all variables to be associated with a specific incident and workgroup outcomes. Figure 3: Data Flow Chart

2006 -2008, illustrates how various levels and types of data in the 2006 - 2008 CISM dataset relate to each other.

Figure 3: CISM Data Flow Chart



Over the three-year period, the CISM unit received 9,768 calls for assistance with critical incidents. As unit staff began to deliver immediate telephonic consultation and support for the incidents, they collected limited initial data such as the incident date, name of organization and contact, the incident location and type of incident. They also asked each affected organization if they would accept *follow-up services* and recorded the decision. Staff entered such data for all 9,768 incidents in an *all-incident database.*

Organizations involved in 5,181 incidents accepted follow-up services. Staff entered them into a separate *follow-up database*. For organizations declining follow-up

(4,497), no additional data is available. Of the 5,181 organizations agreeing to follow-up, a portion (4,500) indicated intent to provide at least one of the on-site services available (groups, individual sessions, and/or management consultations), 681 organizations declined any on-site services. Most of the 4500 (4,337), eventually received at least one of the on-site services, while 844 organizations utilized only telephonic assistance.

In order to access this program data for analytic purposes, I first had to extract the data and assemble it into a useable dataset.

Data Extraction

All-Incident Database Extraction. Data collected over three years from 2006 to 2008 on 9,678 incidents and workgroups was extracted. Also noted above, this non-integrated data is available in three frequency distributions – incident location by state or international location, incident type and whether the organization accepted follow-up services. Since this data is not used in the research, for reference purposes, it is presented in Appendix D: All-Incident Database.

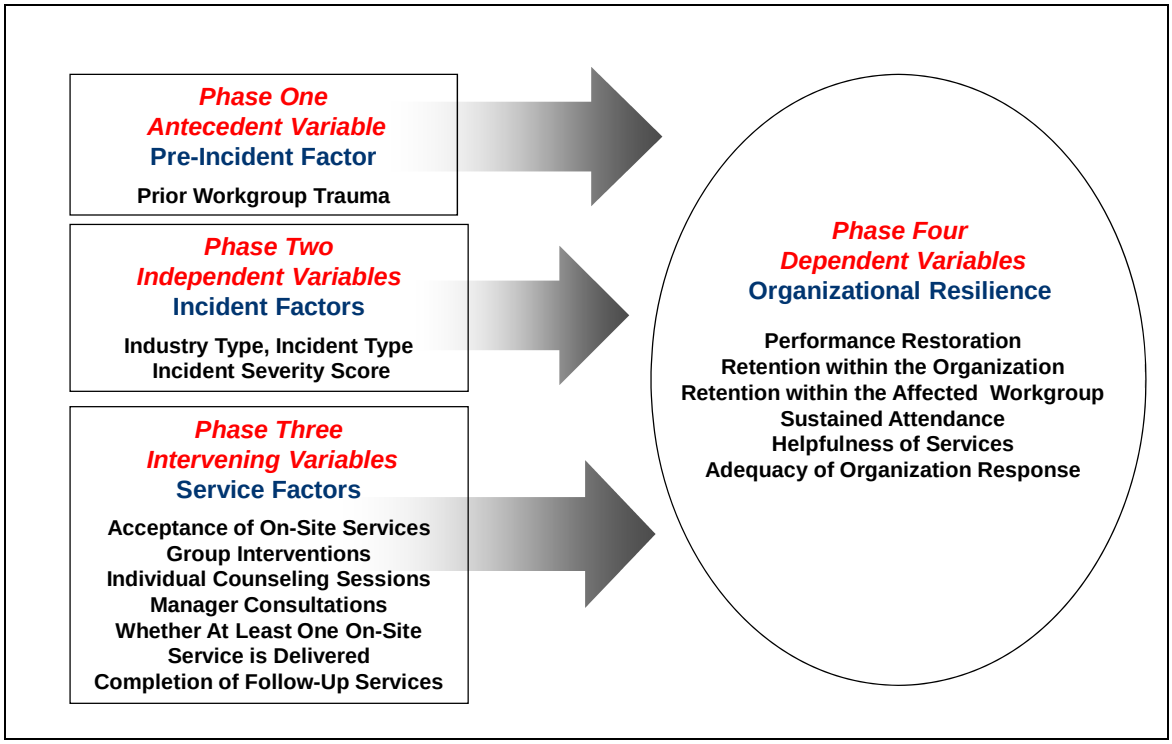
Follow-Up Database Extraction - Construction of a Single Dataset. The unit's data managers extracted data for three years (2006, 2007, 2008), populating three separate Excel files, based on a data extraction template (see Appendix E). Data were then loaded into SPSS. Based on the observation that the data is remarkably consistent in terms of trends and patterns from year to year, I made the decision to combine the data from all three years into one dataset. While there appears to be little analytic value to comparing years, combining years increases sample size (5,181 incidents) and therefore

the power of any analysis. Next, based on valid, available data, a bivariate research proposition was defined.

Bivariate Research Proposition

Given the exploratory nature of the study, an initial bivariate research proposition incorporates all reliable data. The bivariate proposition is that knowledge of variables in the first three critical incident phases (pre-incident, incident and service factors) predict for organizational outcomes (the fourth phase). Subsequently, a multivariate research proposition will refine the study and incorporate only variables found to be significant at the bivariate level. See Figure 4: Bivariate Research Proposition.

Figure 4: Bivariate Research Proposition



Clinical Data Mining (CDM): Practice-Based Research (PBR)

The CISM unit of the EAP in this study has available rich practice data that is well suited for quantitative CDM as an approach to exploring the research proposition. Data are computerized, potentially allowing for complex bivariate and multivariate analyses with a large population (Epstein, 2009). CDM has several advantages. Rothman and Epstein (1977) note that social work knowledge production rarely occurs in a form immediately translatable and useable by practitioners and that this gap between research and practice increases the chances of error in application. They argue for social work practitioners to pay not only greater attention to research in general but for the profession to close the gap between knowledge production and knowledge utilization in practice.

Clinical data mining aligns with this recommendation. Epstein and Blumenfield (2001) argue that the value of CDM as a practice-based research strategy is its ability to inform social work practice unobtrusively. Several other authors advocate for clinical data mining and its advantages, which include realizing the potential of readily available data, the promotion of reflective practice and better integration of practice with research (Auslander, Dobrof, & Epstein, 2001; Hutson & Lichtiger, 2001; Joubert & Epstein, 2005; Raiz, 2004; Sainz & Epstein, 2001).

This study is conducted by a social work practitioner seeking the answer to practice questions for a particular program, using available data. The decision to use a convenience sample, with its known limitations, is a conscious one. Bridging the gap between research-based practice and practice-based research, it allows for "evidenced informed practice" (Epstein, 2009). Further, despite the study's stated goal to improve practice, rather than aspire to generalizability, it potentially makes important contributions to research knowledge (Epstein, 2009) in the evolving field of organizational resilience to workplace trauma.

Randomized Controlled Trials (RCT) vs. Non-Controlled Studies

In this study, predictors include variables such as industry type, incident type, severity of incident and type of service. However, since the research design relies on clinical data mining within an existing dataset derived from naturally occurring workgroups, it precludes a classic experimental approach involving randomization of independent variables. Given the retrospective approach, random assignment of

workgroups to an industry type, an incident type, an incident of a certain severity, etc. is not possible. The field of workplace trauma presents various challenges to RCTs. These include the nature and unpredictability of critical incidents and the necessity to provide services to recipients unknown to the program until, in some cases, a few hours before service delivery. Research that calls for pre and post assessments of traumatic stress is problematic due the inability to gain access to individuals in the workplace in general and especially in a chaotic workplace immediately after an incident. Further, there are significant ethical issues associated with withholding services in the aftermath of traumatic workplace incidents (Epstein, 2009; Kenardy, 2006). For example, recently a major research university submitted a proposal to use agency data from a client organization (a major national bank) to research the impact of prior resiliency training on workgroup adaptation post-trauma (robbery, shooting, assault, etc). [IRB conditions for this study prohibit citation of the researchers, the proposal or client organization]. Due to the proposed research's design to provide training to some branches of the bank but not to others, the client organization rejected the research on ethical grounds and subsequently, the agency National Research Review Board (NRRB) denied the proposal. Had the researchers agreed to provide resiliency training to *all* bank branches, a related, albeit qualitatively different research project could have proceeded. While in this instance, forgoing an experimental design (RCT) would have compromised generalizability and support for making causal inferences about resiliency training, abandoning the research altogether compromised the opportunity to obtain significant practice knowledge that such a large-scale study would have produced, not to mention contributing new information relevant to future RCT studies. Similarly, in this study, the

inability to manipulate values in support of randomization for experimental purposes is not sufficient reason to dismiss the potential practice (and research) knowledge discoverable in previously unexplored data on over 5000 workgroups impacted by workplace trauma. Further supporting the credibility of the study's design is the large sample size and that some degree of randomization exists in that any type of workgroup incident could have occurred anywhere in the country and potentially associates with any variable value. In addition, the study achieves some degree of external validity where results may be applicable to similar CISM units and achieves a high degree of internal validity. All findings are immediately usable and relevant to the unit in the study. Another advantage of this research is its empirical exploration of whether anticipated variables predict the occurrence of various organizational outcomes within a workgroup following trauma. Finally, in some respects, where the study relies on multivariate analysis, it approximates an experimental design (Sainz & Epstein, 2001) by predicting or explaining causal relationships.

Chapter Three

Univariate Analyses of a Critical Incident Database

Reliability Analysis of an Incident Severity Scale

The following sections analyze variables according to their alignment with the four critical incident phases. First, they analyze pre-incident phase data (which includes only one variable – prior workgroup trauma), followed by incident phase data (several characteristics of incidents), service phase data (the various services delivered) and finally, organizational outcome data. In order to frame the research within the confines of a national study, the analysis to follow excludes ten international incidents. When analyzing frequency percentages, where there is missing data, in order to present the most relevant distribution patterns, discussion focuses on valid percentages.

Pre-Incident Variable: Prior Workgroup Trauma

At two days post-incident, staff inquires about whether a previous traumatic incident affected the same workgroup. Staff records “prior workgroup trauma” or “no prior workgroup trauma”, as a dichotomous variable. Table 4: Prior Workgroup Trauma Within 12 Months of Current Incident 2006 – 2008, presents results.

Table 4
Prior Workgroup Trauma Within 12 Months of Current Incident 2006 - 2008

Group History	# Incidents	%	Valid %
No Prior Workgroup Trauma	3539	68.3%	80.7%
Prior Workgroup Trauma	848	16.4%	19.3%
Valid Total	4387		
Missing	794	15.3%	
Total Incidents	5181	100.0%	100.0%

For followed up incidents, of 4,387 with recorded data on prior trauma, the clear majority, 80.7% did not experience a prior traumatic incident within the past 12 months. However, a still sizable number (848, 19.3%) of the incidents involved workgroups that did experience prior workgroup trauma. Results were unrecorded for 794 incidents. Cross comparing prior workgroup trauma with industry type shows that the majority of incidents with a prior trauma occurred in industry settings susceptible to critical incidents, namely finance and insurance (52.7%) and retail and wholesale trade (13.9%).

Incident Variables: Location, Incident Type, Industry Type, Incident Severity Score

Among the *incident variables*, location of the incident by state, despite being of limited relevance for analyzing associations between variables relevant to the proposition, is of interest descriptively and therefore, analyzed below. Also analyzed is the geographical region where the incident occurred (northeast, west, etc.), industry type (finance, retail, etc.), incident type (death, natural disaster, etc.) and incident subtype (suicide as a subtype of death, flood as a subtype of disaster, etc.). All are categorical variables. The analysis also includes results of a severity assessment scale designed by the unit, the “CrISIS Scale” (Critical Incident Stress Index Scale). This scale originally

included nine severity indices (ordinal variables) combining into an aggregate severity score (a discrete, numeric variable). Since results of a Cronbach's Alpha showed the reliability of the scale could be significantly improved if certain indices were deleted, it was revised accordingly. The original scale, Cronbach's Alpha results and the revised scale are also described below.

Incident Requests by State. Table 5: Incident Service Requests by State: 2006 - 2008 displays the distribution of service requests throughout the United States. As noted, this distribution excludes international incidents.

Table 5 Incident Service Requests by State: 2006 - 2008

	# Incidents	%		# Incidents	%
California	547	10.6%	Nevada	42	0.8%
Texas	448	8.6%	Minnesota	31	0.6%
Florida	427	8.2%	Delaware	28	0.5%
Georgia	415	8.0%	Oklahoma	27	0.5%
Pennsylvania	288	5.6%	Wisconsin	22	0.4%
Ohio	235	4.5%	Mississippi	21	0.4%
North Carolina	214	4.1%	Iowa	20	0.4%
New York	204	3.9%	Kansas	20	0.4%
Virginia	200	3.9%	DC	19	0.4%
New Jersey	186	3.6%	Utah	18	0.3%
Maryland	175	3.4%	Arkansas	16	0.3%
Tennessee	152	2.9%	West Virginia	15	0.3%
Washington	151	2.9%	Alaska	14	0.3%
Illinois	143	2.8%	Idaho	14	0.3%
Missouri	128	2.5%	New Mexico	14	0.3%
Alabama	118	2.3%	Rhode Island	13	0.3%
Colorado	111	2.1%	Maine	11	0.2%
Arizona	93	1.8%	Nebraska	8	0.2%
Massachusetts	88	1.7%	New Hampshire	8	0.2%
Michigan	88	1.7%	Hawaii	5	0.1%
Indiana	76	1.5%	North Dakota	4	0.1%
Oregon	69	1.3%	Montana	3	0.1%
South Carolina	68	1.3%	South Dakota	2	0.04%
Louisiana	67	1.3%	Vermont	1	0.02%
Kentucky	61	1.2%	Wyoming	0	0.0%
Connecticut	53	1.0%	Total Incidents	5181	100%

Organizations in California (10.6%) received assistance for the greatest number of incidents, followed by Texas (8.6%), Florida (8.2%), Georgia (8.0%), Pennsylvania (5.6%), Ohio (4.5%) and New York (3.9%). Reasons for the observed frequencies may relate to the portion of agency organizations eligible for its services in certain states. The unit may serve a greater portion of organizations in densely populated states, such as California, Florida and New York, than in sparsely populated states. Consistently, organizations in sparsely populated states received assistance for the fewest number of

incidents (North Dakota, Wyoming Montana, etc). Response patterns may also reflect incident-related characteristics. Organizations in states prone to natural disasters (such as California - for wildfires and earthquakes, and Florida – for hurricanes) requested more assistance than states not vulnerable to those disasters. Another possible interpretation for observed frequencies is that industrialized states requested more assistance than agriculturally oriented states.

Incident Requests by Region. The unit staff sorts organizations' requests for assistance with a critical incident into geographical regions based on the state where the affected workgroup is located. States organize within four pre-established regional boundaries. Staff used their own preferences in defining the boundaries, following no special criteria or logic. See Table 6: Regional Location Groupings below.

Table 6:
Regional Location Groupings

Region	Included States
Northeast	Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont
South	Alabama, Arkansas, District of Columbia, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia
Midwest	Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin
West	Alaska, Arizona, California, Colorado, Hawaii, Idaho. Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming

Table 7: Incidents by Region 2006 - 2008 shows the distribution.

Table 7 Incident by Region 2006 - 2008		
	# Incidents	%
South	2471	47.7%
West	1081	20.9%
Northeast	852	16.4%
Midwest	777	15.0%
Total Incidents	5181	100.0%

Organizations in Southern states requested assistance for the greatest portion of incidents (47.7%), followed by Western states (20.9%), Northeastern states (16.4%) and Midwestern states (15.0%). Possible explanations for the observed regional trend are similar to those cited above for individual states. If eligible populations were higher in one regional grouping of states than other regions, we would anticipate that more incident requests would come from that region. Requests for assistance in the grouping of Southern states may relate to their vulnerability to a specific natural disaster - hurricanes. The higher proportion of requested assistance from Western states may reflect the pacific coast states' vulnerability to different natural disasters – earthquakes, wildfires or floods.

Industry Type. Based a national industry classification system (NAICS, 2007), each client organization is assigned an industry classification code. Several industries, accounting for a large number of incidents, sufficient for analysis warrant maintenance in their original versions. These include finance and insurance; professional, scientific and technical; public administration; utilities and real estate/rental leasing. However, due to the occurrence of a relatively small number of incidents in certain industries, grouping related industries is needed to improve analysis. Specifically, hotels, accommodations, restaurants, food services, arts, entertainment and recreation are grouped into a new

category - “travel and leisure”. Health care services, educational services and social services are grouped into “health, education and social services”. Construction, manufacturing and mining are grouped into “construction, manufacturing and mining”. Wholesale trade and retail trade are grouped together into “trade – wholesale and retail”. The category “other services” captures multiple service industries with few incidents each. These include administrative services, waste management, agricultural, forestry, fishing and hunting management, information services, management and consulting, transportation and warehousing services and any uncategorized services. Table 8: Number of Incidents by Industry Type 2006 - 2008, details the distribution of incidents.

Table 8: Number of Incidents by Industry Type 2006 - 2008

	# Incidents	%
Finance and Insurance	2055	39.7%
Trade - Wholesale and Retail	985	19.0%
Construction, Manufacturing and Mining	558	10.8%
Health, Education and Social Services	301	5.8%
Other Services	286	5.5%
Professional, Scientific and Technical	269	5.2%
Travel and Leisure	253	4.9%
Public Administration	230	4.4%
Utilities	177	3.4%
Real Estate, Rental and Leasing	67	1.3%
Total Incidents	5181	100.0%

For industry type, overwhelmingly, the finance and insurance industry requested assistance for the most incidents (39.7%), followed by trade settings (19.0%), construction, manufacturing and mining (10.8%) and health, education and social services (5.8%). Accounting for the remainder of affected industries are professional

scientific and technical (5.2%), travel and leisure (4.9%), public administration (4.4%), utilities (3.4%) and real estate, rental and leasing (1.3%).

While any industry potentially exposes employees to critical incidents, the data suggests, at least for the CISM unit sample, workers within financial environments (which includes banks) and retail stores (which includes fast food and retail chains) are especially vulnerable to workplace trauma (McCullough, 2008). We would anticipate a higher incidence of criminal acts occur in such public-facing environments as opposed to non-public facing environments such as manufacturing or construction. The sample statistics support this anticipated trend.

Incident Type. Based on its experience, the unit identified general categories of incidents most relevant to its work. Table 9: Number of Incidents by Incident Type 2006 - 2008, presents the distribution of incident types.

Table 9: Number of Incidents by Incident Type 2006 - 2008

	# Incidents	%
Death	2258	43.6%
Criminal Act	1950	37.6%
Organization Change	486	9.4%
Other Employee Stressor	163	3.1%
Disaster - Industrial & Natural	111	2.1%
Accident	109	2.1%
Illness	104	2.0%
Total Incidents	5181	100.0%

The incidents types for which organizations request the most assistance are deaths (43.6%) and criminal acts (37.6%). Employee death potentially occurs in any industry and occurs with regularity. The high incidence of criminal acts is consistent with the high number of requests for assistance from financial organizations, which includes banks.

Accidents (2.1%), disasters (2.1%) and illnesses (2.0%) contributed fewer traumatic incidents. For non-traumatic incidents, organizational change (9.4%) generated a high number of requests for assistance (486) and other employee stressors represented fewer at 3.1%.

Incident Subtype. Also based on its experience, the unit identified various subtypes of incidents most relevant to its work. For example, deaths as a major incident type include subtypes of natural deaths, accidental deaths, suicides and homicides. Criminal acts include the subtypes robbery, violent threats, assault, etc. Table 10: Number of Incidents by Subtype 2006 – 2008, reports the distribution.

Table 10: Number of Incidents by Subtype: 2006 - 2008

Type	SubType	# Incidents	% of Type	% of Total
Death	Natural Death	1,011	44.8%	19.5%
	Accidental Death	619	27.4%	11.9%
	Suicide	334	14.8%	6.4%
	Homicide	294	13.0%	5.7%
	Total Deaths	**2,258**	**100%**	**43.5%**
Criminal Act	Robbery	1,780	91.3%	34.4%
	Threat of Violence	65	3.3%	1.3%
	Assault	55	2.8%	1.1%
	Other Criminal Act	47	2.4%	0.9%
	Abuse/Neglect	3	0.2%	0.1%
	Arson	0	0.0%	0.0%
	Total Criminal Acts	**1,950**	**100%**	**37.8%**
Organizational Change	Reduction in Force	333	68.5%	6.4%
	Site Closing/Relocation	77	15.8%	1.5%
	Employee Termination	53	10.9%	1.0%
	Reorganization	23	4.8%	0.4%
	Total Organizational	**486**	**100%**	**9.3%**
Other Employee Stressor	Conflict Resolution	44	26.8%	0.8%
	Job-Related Stress	40	24.4%	0.8%
	Peer Impact	24	14.6%	0.5%
	Individual Crisis	23	14.0%	0.4%
	Multiple Stressors	21	12.8%	0.4%
	Other Employee Incident	12	7.3%	0.2%
	Total Employee Stressors	**164**	**100%**	**3.1%**
Accident	Injury	77	70.6%	1.5%
	Motor Vehicle Accident	24	22.0%	0.5%
	Other Accident	5	4.6%	0.1%
	Accidental Fire	3	2.8%	0.1%
	Total Injuries	**109**	**100%**	**2.2%**
Illness	Terminal Illness	53	51.5%	1.0%
	Illness - Other	50	48.5%	1.0%
	Total Illnesses	**103**	**100%**	**2.0%**
Disaster: Natural & Industrial	Hurricane	43	38.7%	0.8%
	Explosion	19	17.1%	0.4%
	Industrial Fire	14	12.6%	0.3%
	Tornado	9	8.1%	0.2%
	Electrocution	8	7.2%	0.2%
	Flood	6	5.4%	0.1%
	Natural Fire	5	4.5%	0.1%
	Other Industrial Disaster	3	2.7%	0.1%
	Earthquake	3	2.7%	0.1%
	Biochemical Accident	1	0.9%	0.0%
	Total Industrial disasters	**111**	**100%**	**2.3%**
Totals		**5,181**		**100%**

This description of incident *subtypes* proceeds in the order of prevalence of overall incident *types,* from the most prevalent type (death) to least prevalent (illness). Within each overall incident *type*, this section in turn, analyzes *subtypes* in their order of prevalence as well.

Death: All deaths represented 43.5% of total incidents (2258). The subtype natural death (1011 incidents) was the most prevalent subtype, comprising 44.8% of deaths, followed by accidental death (619, 27.4%), suicide (334, 14.8%) and homicide (294, 13%).

Criminal Act: All criminal acts comprised 37.8% of total incidents (1950). Within criminal acts, the overwhelmingly prevalent subtype was robbery (1780 incidents, 91.3% of criminal acts), followed by much fewer threats of violence (65, 3.3%) and assaults (55, 2.8%). The remaining criminal acts accounted for 2.6%.

Organizational change accounted for 9.3% of all incidents (486) and contributed the following subtypes: reduction in force (333, 68.5% of organizational changes), site closing or relocation (77, 15.8%), employee terminations (54, 10.9%) and re-organization (23, 4.7%).

Other Employee Stressors: Incident subtypes related to non-specific employee stress contributed only 3.1% of all incidents (164). They included conflict resolution (44, 26.8% of employee stressors), job related stress (40, 24.4%), stress from a peer's crisis (24, 14.6%), individual employee crisis (23, 14.0%) and multiple stressors (21, 12.8%). Other stressors accounted for 7.3%

Accidents: Accidents account for 2.2% of total incidents (109). The most prevalent accident subtype was a personal injury (77, 70.6% of accidents) followed by a motor vehicle accident (24, 22.0%). Other accidents represented 7.4%.

Disasters: Disasters represented 2.3% of all incidents (111). The subtype hurricane (43, 39% of disasters) was most prevalent, followed by explosions (19, 17%), industrial fires (14, 13%), tornadoes (9, 8%), electrocutions (8, 7%) and floods (6, 5%). Other subtypes accounted for the remaining 11%.

Illnesses: Of all incidents, 2.0% were illness-related (103). The subtype terminal illness contributed 53 incidents (51.5% of illnesses) while non-terminal illness contributed 50 (48.5%).

These various types and subtypes of critical incidents each involve varying levels of severity, reviewed next.

Incident Severity Measurement - CrISIS Scale

Chapter one reviewed types of critical incidents, which vary in their severity of impact on individual victims and witnesses, resulting in differing incidences of traumatic stress disorders. Reflecting much of the literature, the focus there centered on assessing severity of impact on individuals, based on clinical symptoms. Instead, this study considers a measure of the severity of an event itself, based only on characteristics of the event, as intended by the agency's unit-created CrISIS Scale. To assess the severity of a workplace incident, the intake team utilizes an internally developed index scale – a "CrISIS scale". The scale is comprised of nine separate ordinal severity indices or

incident characteristics considered by the unit to contribute to overall incident severity. The indices assess the degree of employee involvement, violence level, injury level, shared group history of trauma, productivity impact, exposure level, advanced knowledge of event, threat level and media exposure (McCullough, 2005). For each incident, staff rates the severity of each of the nine indices on a six-point Likert scale of zero to five. Scoring is guided by a scoring key (see Appendix F, Critical Incident Severity Index Scale (CrISIS) Scoring Key, Parts 1 and 2). The series of tables to follow later in this section indicate the distribution of Likert scale ratings for each index, along with the indices' means and standard deviations.

It is important to note that the CrISIS Scale assesses the overall severity level of an incident its characteristics. It does not assess impact of an event on employee's individual symptoms. Several instruments exist to assess such impact (Derogatis, 1983; Devilly & Hutchings, 2004; Elklit, 1993; Foa, Riggs, Dancu, & Rothbaum, 1993; Goldberg, 1971; Hammerberg, 1991; Horowitz, Wilner, & Alvarez, 1979; E. Newman, Kaloupek, & Keane, 1996; Tehrani, Cox, & Cox, 2002; Weiss & Marmer, 1997). However, due primarily to significant barriers and possible ethical issues to accessing individuals during and immediately following traumatic incidents in a workplace setting, the CISM program does not assess individual impacts. Also important to note is that, to date, the scale had not been subjected to reliability verification. Therefore, following the descriptive analysis and the results of a Cronbach's Alpha are reported.

Employee Involvement. This index assesses the portion of employees directly and indirectly involved in an incident relative to the total employees at the site where the incident occurred. Employees of the same organization at other sites around the country,

though possibly equally affected by the incident do not factor into the assessment. If other sites call for assistance, staff assesses them separately. To score this index, staff first determines how many employees are at the location where the incident occurred and then the number of employees directly and indirectly affected. Based on quintiles, staff then uses the total percentage involved to assess a score from zero to five. Staff scores incidents with less than 20% of the site involved as one, whereas they score incidents with between 81% - 100% involved as a five. In theory, if an incident involved no employees at all, the score would be zero, but in fact, organizations typically do not call in such situations. This sample confirms this as no incidents received a zero rating. For scoring examples, an incident at a site with 100 employees where an employee death directly involves a workgroup of ten but also indirectly involves the other 90 employees is scored a five (100% affected). At a site with 1000 employees, an explosion directly involving a workgroup of ten and indirectly involving 90 other employees would be scored a one (20% involved). Table 11: Employee Involvement Index Scores: 2006 -2008 details results.

Table 11: Employee Involvement Index Scores: 2006 - 2008

Likert Rating	# Incidents	%
5	2495	48.1%
4	464	8.9%
3	461	8.9%
2	613	11.8%
1	1148	22.2%
Total Incidents	5181	100.0%

M = 3.4; SD = 1.6

For the extent of employee involvement in incidents, staff assessed a rating of five (high employee involvement) for 48.1% of incidents, followed by incidents with scores

of four (9.0%), three (8.9%), two (11.8%) and one (22.2%). No incidents scored a zero. Nearly half of the incidents scored the highest rating. Finding that no incidents scored zero is consistent with organizations not calling for assistance with incidents in which there was no meaningful employee involvement. The score distribution is semi u-shaped and skews from right to left. The majority of incidents score the highest value and incidents scoring a low value outnumber those with intermediate values. The mean involvement score is 3.4, somewhat higher than the center of the scale. The standard deviation is 1.6.

Violence Level. CISM staff rate level of violence based on the organizational observer's report of the nature of the incident. Informing the rating are traumatic stimuli, amount of bodily harm, weapons involvement and the extent of external force. For example, staff would assess a zero score to a natural death in a hospital involving no traumatic stimuli (no observable blood) and involving no action on the part of another. They would assess an incident involving disturbing verbal threats but involving no bodily harm as a one. In an extreme case involving traumatic stimuli, external force and serious bodily harm – all characteristics of an attack with a weapon – staff will score violence as a five. Table 12: Violence Level Index Scores: 2006 – 2008 displays the results.

Table 12: Violence Level Index Scores: 2006 - 2008		
Likert Rating	# Incidents	%
5	1063	20.5%
4	508	9.8%
3	436	8.4%
2	528	10.2%
1	381	7.4%
0	2265	43.7%
Total Incidents	5181	100.0%
M = 1.9; SD = 2.0		

For the violence level of incidents, staff rated scores of five (20.5%), four (9.8%), three (8.4%), two (10.2%), one (7.4%) and zero (43.7%). Nearly half of the incidents scored as non-violent. Here again, the score distribution is u-shaped. The majority of incidents score the lowest value (zero). Incidents scoring the highest value (5) outnumber those with intermediate values. This skews the distribution from left to right. The mean violence score is 1.9, below the mid-point of the scale and the SD is 2.0.

Injury Level. This index measures the extent of physical injures incurred and considers amount of medical attention applied. For example, staff scores an incident resulting in some bruising, not requiring any medical care as low (1). They would score an incident resulting in minor injuries needing medical care higher (2 to 3). If an incident resulted in the loss of a limb with the employee hospitalized in intensive care, staff will score the incident at the highest rating (5). Table 13: Injury level Index Scores: 2006 - 2008 reports the distribution of injury scores.

Table 13: Injury Level Index Scores: 2006 - 2008		
Likert Rating	# Incidents	%
5	2286	44.1%
4	148	2.9%
3	106	2.0%
2	78	1.5%
1	79	1.5%
0	2484	48.0%
Total Incidents	5181	100.0%
M = 2.4; SD = 2.4		

For the extent of injury involved in incidents, staff assessed incidents with scores of five (44.1%), four (2.9%), three (2.0%), two (1.5%), one (1.5%) and zero (48.0%). Staff rated roughly half of the incidents as non-injurious and half as involving extreme injury. Few incidents (8%) involved injury in between. The score distribution for injury is therefore u–shaped, a bi-modal distribution with a polarization of scores towards either the highest or the lowest with few intermediate scores. A bi-modal distribution suggests two distinct populations, perhaps one where the incidents are organizational in nature, with no possibility of injury and another where injury was the reason for or a characteristic of the incident. The mean injury score is 2.43, at the mid-point of the scale and the SD is 2.42.

Group History of Trauma. Staff assesses whether traumatic experiences occurred in the workgroup's history. If there is no workgroup experience with a prior traumatic incident, staff assesses a zero. If a prior incident occurred, staff assesses how recently it occurred. Per the scoring key staff scores prior incidents occurring six months ago or less as a five, whereas they will score a prior incident occurring more than five years ago as a one. Other scores fall in between, contingent on the recentness of the event. Table 14:

Workgroup Trauma History Index Scores: 2006 -2008 details how staff scored incidents in the sample.

Table 14: Workgroup Trauma History Index Scores: 2006 - 2008

Likert Rating	# Incidents	%
5	696	13.5%
4	251	4.8%
3	264	5.1%
2	111	2.1%
1	36	0.7%
0	3823	73.8%
Total Incidents	5181	100.0%
M = 1.0; SD = 1.8		

For the index scores for group history of trauma, staff rated the overwhelming majority of incidents, nearly three-quarters of workgroups served (73.8%) as involving no prior history of workplace trauma. This suggests that in most cases, the incident triggering assistance is their first experience with a traumatic workplace incident. However, more than one-quarter (1358 incidents, 26.2%) do involve some history of trauma. The score distribution is roughly reversed j-shaped. The clear majority of incidents scored the lowest value (zero) with incidents gradually increasing in number from scores of two to five. This skews the distribution from left to right. The mean score is 1.07, below the mid-point of the scale and the SD is 1.88.

Attendance Impact. Staff assesses whether the incident indirectly affects productivity by the degree of absence from the workplace post-incident. If there is no absence, staff assesses a zero. Staff rate minimal time away from duties as one and more than three days away from work as a five. Scores in between align with progressively more lost time. Time away from the job does not always associate with overall incident

severity. For example, despite a threatening robbery at a bank, if the branch experienced robbery several times before, the staff may be accustomed to dealing with the aftermath and the branch may only shut down for a few hours. Staff taking time off to attend a funeral for a co-worker's natural death could be out longer. An employee shooting or a hurricane can result in closing down an entire site for several days. Table 15: Attendance Impact Index Scores: 2006 -2008 provides the incident distribution among attendance impact scores.

Table 15: Attendance Impact Index Scores: 2006 - 2008

Likert Rating	# Incidents	%
5	71	1.4%
4	109	2.1%
3	411	7.9%
2	1301	25.1%
1	1335	25.8%
0	1954	37.7%
Total Incidents	5181	100.0%
M = 1.1; SD = 1.1		

For the index scores for attendance impact, staff assessed ratings of five (1.4% of incidents), four (2.1%), three (7.9%), two (25.1%), one (25.8%) and zero (37.7%). The most frequent staff rating reflected no impact on attendance. The observed tendency is for the number of incidents that disrupt employee's attendance decreases as impact scores increase. However, roughly two thirds (62%) involves some level of absence from work. The score distribution skews consistently left to right as the majority of incidents scored the lowest value (zero, no absences) with incidents gradually decreasing in number as score rise from two to five (increasing absences). The mean score is 1.1, well below the mid-point of the scale and the SD is 1.1 as well.

Employee Exposure Level. Staff score this index based on the extent to which employees directly witness the incident. For example, an incident occurring off-site and not witnessed by employees scores low whereas an incident occurring on-site and witnessed directly will score high. Table 16: Employee Exposure Level Index Scores: 2006 -2008 provides the incident exposure scores.

Table 16: Employee Exposure Level Index Scores: 2006 - 2008

Likert Rating	# Incidents	%
5	2703	52.2%
4	116	2.2%
3	85	1.6%
2	102	2.0%
1	1792	34.6%
0	383	7.4%
Total Incidents	5181	100.0%
M = 3.1; SD = 2.0		

For the index scores for employee exposure, staff rated the incidents as five (52.2%), four (2.2%), three (1.6%), two (2.0%), one (34.6%) and zero (7.4%). Over half of the incidents received the highest rating and approximately a third received the low score of one. The score distribution for employee exposure suggests a bi-modal distribution. Significantly fewer incidents received scores of zero, 2, 3 or 4, resulting in a somewhat negative skew to the left. The mean exposure score is 3.1, higher than the mid-point of the scale and the SD is 2.0.

Advanced Knowledge of the Incident. For this index, staff measures the degree to which employees had notice or warning about an incident and therefore the extent to which they could prepare for it. Staff bases the score on employees' perception of

anticipation, not management's. In contrast to how the other indices are scored, but consistent with each index scoring higher the more negative the impact on workgroups, this index is scored high (five) for no or little advanced knowledge of an incident (highly negative workgroup impact). Conversely, staff score incidents low (zero) when employees have significant notice of an event (low, positive workgroup impact). For example, if a site closing and lay offs are announced several weeks ahead of the event, it will be rated low. For the same event, if management does not inform employees until they receive their notice of lay off, staff will rate it high. Some incident types, such as an earthquake, are by their nature unpredictable and always score high, while others, such as hurricanes, frequently involve advanced notice and score lower. Table 17: Advanced Knowledge Index Scores: 2006 -2008 provides distribution of incident scores.

Table 17: Advanced Knowledge Index Scores: 2006 - 2008

Likert Rating	# Incidents	%
5	3075	59.4%
4	1778	34.3%
3	124	2.4%
2	32	0.6%
1	16	0.3%
0	156	3.0%
Total Incidents	5181	100.0%
M = 4.4; SD = .9		

Unit staff rated the majority of incidents (59.4%) with a score of five, meaning no advanced notice (high negative impact), followed closely by a score of four (34.3%), indicating 93.7% of affected workgroups had no or very little advanced knowledge about the occurrence of the incident. Significantly fewer incidents scored between three and zero (6.3%), indicating some level of advanced notice. The score distribution is j–shaped.

These scores skew the distribution from right to left. The mean advanced knowledge score is 4.4, well above the scale's mid-point and the SD is .9.

Threat Level. To assess the level of threat, staff considers perceived threat and the level of hyper-arousal accompanying it. Due to perception being central to this index, staff considers conditioned desensitization to threat. For example, in the situation of a fast food restaurant robbed so frequently that the current staff, repeatedly exposed to threats, are somewhat adapted to them, the incident of another robbery could be rated lower than if the same incident occurred in another restaurant that never experienced a robbery. Table 18: Threat Level Index Scores: 2006 - 2008 provides the incident threat scores.

Table 18: Threat Level Index Scores: 2006 - 2008

Likert Rating	# Incidents	%
5	32	0.6%
4	12	0.2%
3	309	6.0%
2	390	7.5%
1	926	17.9%
0	3512	67.8%
Total Incidents	5181	100.0%
M = .5; SD = .9		

For the index for threat level, staff assessed scores of five (.6% of incidents), four (.2%), three (6.0%), two (7.5%), one (17.9%) and zero (67.8%). Predominantly, workgroup incidents in the sample do not involve a high level of perceived threat. These findings of very low scores for threat, while seeming counter intuitive, are consistent with the assessment of perception of threat. The question to which the organizational observer is responding to is to what extent the workgroup perceived a threat to their safety. This finding is also consistent with the prevalence of specific types of incidents in the sample

and their different characteristics. For example, when isolated deaths, accidents and illnesses directly affect one or more employees, the surviving workgroup, while greatly distressed is not usually fearful for their own safety. Organizational change, representing nearly 10% of incidents, potentially causes severe employee stress but does not normally involve a high level of perceived immediate threat. Natural disasters (floods), industrial disasters (toxic chemical release) and terrorism certainly involve perceived threats, but they rarely occur in the sample (1.4% of incidents combined). Criminal acts (robberies, assaults, etc.) however, often involve high levels of perceived threat to personal safety and account for 37% of incidents. Consistent with this frequency is the result that 33% of incidents here involve some level of perceived threat. Conversely, 67% of incidents do not involve any meaningful perceived threat to safety.

The scores distribution for threat level is reversed j-shaped. The clear majority of incidents scored the lowest value (zero) with incidents decreasing in number as scores rise from one to five. This skews the distribution from left to right. The mean threat score is .5, far below the scale's mid-point and the SD is .9.

Media Exposure. This index measures the level of internal and external publicity about an incident. Psychosocial functioning is negatively affected in those exposed to extensive media reports of an event (Rosenfeld, Caye, Ayalon, & Lahad, 2005). Staff research news sources and query company contacts in order to score this index. For example, if only the workgroup is aware of the incident, it receives a low score. Staff assesses progressively higher scores based on whether the incident received attention throughout the site, is the subject of local media reports, results in statewide publicity or

receives national or international coverage. Table 19: Media Exposure Index Scores: 2006 - 2008 provides the incident media scores.

Table 19: Media Exposure Index Scores: 2006 - 2008

Likert Rating	# Incidents	%
5	188	3.6%
4	28	0.5%
3	544	10.5%
2	3188	61.5%
1	1039	20.1%
0	194	3.8%
Total Incidents	5181	100.0%
M = 1.9; SD = .8		

Staff scored media exposure at these levels: five (3.6%), four (.5%), three (10.5%), two (61.5%), one (20.1%) and zero (3.8%). Staff rated the clear majority of incidents (96%) as involving moderate to no media coverage of the incident. Very few incidents (4.1%) involved high or very high levels of media coverage. The score distribution for media coverage clusters mostly around two and secondarily around one, with fewer incidents scoring zero, three, four or five. This skews the distribution somewhat to the right. The mean media score is 1.9, just below the scale's mid-point, and the SD is .8.

Incident Severity Indices: Statistical Summary. Table 20: CrISIS Scale Indices: Measures of Central Tendency and Dispersion by Index, displays a summary of the measures of central tendency and dispersion for all indices.

Table 20:
CrISIS Scale Indices: Measures of Central Tendency and Dispersion by Index

Index	Mean	Median	Range	Variance	SD	Skewness	SES	Kurtosis
Advanced Knowledge	4.43	5.00	5.00	0.96	0.98	-2.94	0.034	10.2
Employee Involvement	3.49	4.00	4.00	2.78	1.66	-0.46	0.034	-1.49
Exposure level	3.13	5.00	5.00	4.16	2.04	-0.26	0.034	-1.8
Injury Level	2.43	2.00	5.00	5.85	2.42	0.05	0.034	-1.94
Violence Level	1.95	1.00	5.00	4.14	2.03	0.41	0.034	-1.48
Media exposure	1.95	2.00	5.00	0.80	0.89	1.04	0.034	3.34
Productivity Impact	1.15	1.00	5.00	1.33	1.15	0.87	0.034	0.45
Group Trauma History	1.07	0.00	5.00	3.54	1.88	1.33	0.034	-0.02
Threat Level	0.55	0.00	5.00	0.90	0.95	1.91	0.034	3.45

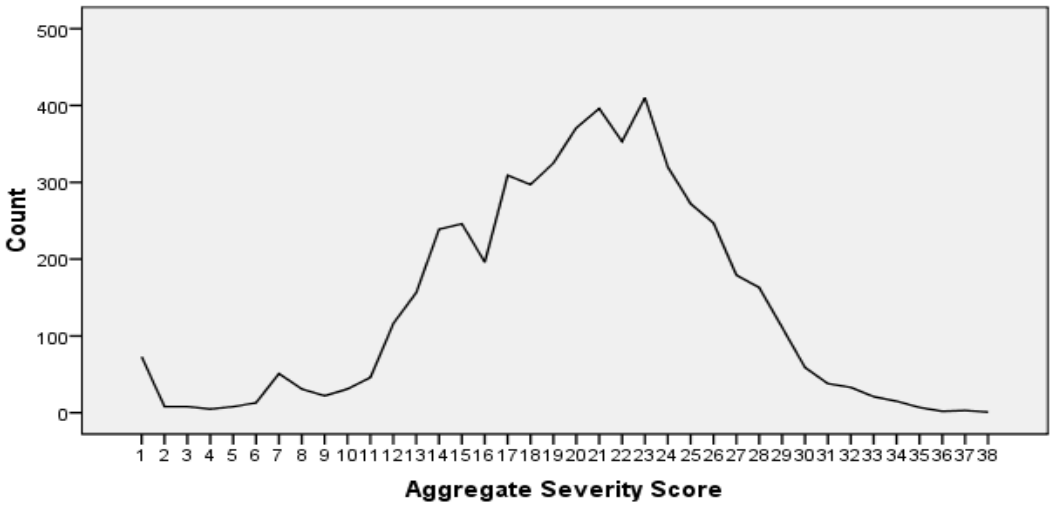
From analyzing all the indices together, the severity of incidents for which organizations request assistance is best characterized by little advanced knowledge of the event (mean = 4.4), a relatively high level of employee involvement in the traumatic incident (mean = 3.4) and a moderately high exposure level (mean = 3.1). This is consistent with the interpretation that an incident that is unexpected, involves a high percentage of employees and a good deal of immediate employee exposure will trigger a call for assistance. Injury level was moderate for most incidents with a mean score of 2.4. Violence level and media exposure were less severe with means of 1.9 each. Most incidents did not notably involve productivity (absence) impact (mean = 1.1), extensive group history of trauma (mean = 1.07) or high levels of threat (mean = .5).

Injury, violence and exposure have the three highest variances and standard deviations, followed by group history of trauma and employee involvement. These characteristics of incidents therefore, vary more widely in level than do levels related to productivity impact/absence, advanced knowledge, threat and media, which had low variances and standard deviations.

Aggregate Severity Scores. To compute the aggregate incident severity score, the

nine scores are added together producing a score from 0 to 45. Appendix G: Incident Severity: CrISIS Scale Aggregate Scores: 2006 – 2008, presents the distribution of aggregate scores with the count of incidents assessed each score. Below, Figure 5: Distribution of Original Incident Severity Scores displays the distribution graphically and summarizes central tendency and dispersion statistics.

Figure 5: Distribution of Original Incident Severity Scores



Valid	5181
Missing	0
Mean	20.14
Std. Error of Mean	.081
Median	21.00
Mode	23
Std. Deviation	5.831
Variance	34.001

Skewness	-.555
Std. Error of Skewness	.034
Kurtosis	.888
Std. Error of Kurtosis	.068
Range	37
Minimum	1
Maximum	38
Sum	104359

Out of 45 possible values, the range in the sample is 37 and the variance is 34. The mean aggregate severity score is 20.1 and the standard deviation is 5.83, indicating a

wide range of scores and good deal of dispersion among them. The median score is 21 and the modal score is 23. The clustering of all three around the middle of the scale's range is consistent with a relatively normal distribution, with few incidents occurring with extremely low or high scores. While incidents of mild impact occur more frequently than incidents of severe impact, skewing the distribution somewhat to the left, Skewness is very low (-.55). The SES is slightly higher at .034. Kurtosis is minimally positive at .8, indicating a distribution slightly more peaked than a normal distribution.

Incident severity is a critical variable in the research proposition and is assumed to play a central role in predicting organizational outcomes. However, this agency-generated scale has not been subjected to reliability verification. Without such analysis, the extent to which the scale measures actual differences in incident severity (as opposed to differences in informant interpretation or staff practices) is not known.

To explore scale reliability, first I tested for significant inter-correlations among the nine individual indices and between each index and the aggregate severity score. A Spearman Correlation Coefficient (Rho) correlation matrix was applied. Second, to ensure the scale incorporates items that contribute reliably to a measure of incident severity, I conducted a Cronbach's Alpha test for scale reliability.

Reliability of the CrISIS Scale: CrISIS Scale Inter-Item Correlations

Table 21: CrISIS Scale Inter-Correlations shows a Spearman Correlation Coefficient (Rho) correlation matrix for the inter-correlation of both **i**ndices with the

aggregate severity score and inter-correlation of scale items. Levels of significance, coefficients and number of incidents are indicated.

Table 21: CrISIS Scale Inter-Correlations

Scale Index		Aggregate Severity Score	Employee Involvement	Violence Level	Injury Level	Group History of Trauma	Absence	Exposure Level	Advanced Knowledge	Threat Level	Media Exposure
Employee Involvement	Coefficient	**.553****									
	Sig. (2-tailed)	.000									
	N	5181									
Violence Level	Coefficient	**.684****	.274**								
	Sig. (2-tailed)	.000	.000								
	N	5181	5181								
Injury Level	Coefficient	**-.077****	-.250**	-.175**							
	Sig. (2-tailed)	.000	.000	.000							
	N	5181	5181	5181							
Group History of Trauma	Coefficient	**.430****	.124**	.064**	-.096**						
	Sig. (2-tailed)	.000	.000	.000	.000						
	N	5181	5181	5181	5181						
Absences	Coefficient	**.601****	.382**	.406**	-.402**	.129**					
	Sig. (2-tailed)	.000	.000	.000	.000	.000					
	N	5181	5181	5181	5181	5181					
Exposure Level	Coefficient	**.519****	.297**	.356**	-.519**	.118**	.544**				
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000				
	N	5181	5181	5181	5181	5181	5181				
Advanced Knowledge	Coefficient	**.028***	-.156**	-.092**	.425**	-.123**	-.181**	-.193**			
	Sig. (2-tailed)	.042	.000	.000	.000	.000	.000	.000			
	N	5181	5181	5181	5181	5181	5181	5181			
Threat Level	Coefficient	**.423****	.195**	.273**	-.404**	.108**	.359**	.433**	-.077**		
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		
	N	5181	5181	5181	5181	5181	5181	5181	5181		
Media Exposure	Coefficient	**.445****	.280**	.264**	-.020	.023	.256**	.163**	.050**	.190**	
	Sig. (2-tailed)	.000	.000	.000	.149	.096	.000	.000	.000	.000	
	N	5181	5181	5181	5181	5181	5181	5181	5181	5181	

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

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

Findings

All indices correlate significantly with aggregate severity score and seven have a coefficient higher than .400. These include violence level *(r = .684)*, absence *(r = .601),* employee involvement *(r = .553)*, exposure level *(r = .519),* media exposure *(r = .445),* group history of trauma *(r = .430)* and threat level *(r = .423).* Since injury level and

advanced knowledge correlates weakly correlate *(r = - .077, .028),* a Cronbach's alpha will be conducted to confirm empirically their potential deletion from the scale.

All but two index inter-correlations are significant and none are strong. Correlating positively and moderately are *absences* with violence level *(r = .406)* and employee exposure *(r = .544)*, *advanced knowledge* with injury level *(r = .425)* and *threat level* with employee exposure *(r = .433).* Indices correlating negatively and moderately include *injury level* with absences *(r = - .402)*, extent of employee exposure *(r = - .519*, and threat level *(r = - .404)*.

Correlating positively but weakly are the following. *Extent of employee involvement* associates weakly with absences *(r =.382)*, exposure *(r = .297)*, violence *(r = .274)*, and group history of trauma *(r = .124)*. *Group history of trauma* associates weakly with violence *(r = .064)*, and absences *(r = .129)*. *Extent of employee exposure* shows a weak relationship with violence *(r = .356)* and group history of trauma *(r = .118)*, while *threat level* shows low correlation with extent of employee involvement *(r = .195)*, violence *(r = .273)*, group history of trauma *(r = .108)* and absences *(r = .359)*. Finally, *media exposure* weakly associates with extent of involvement *(r = .280)*, violence level *(r = .264)*, absences *(r = .256)*, extent of employee exposure *(r = .163)*, advanced knowledge *(r = .050)* and threat level *(r = .190)*.

Indices correlating negatively and weakly are *injury level* with extent of employee involvement *(r = - .250)*, violence *(r = - .175)* and group history of trauma *(r = - .096); advanced knowledge* with extent of employee involvement, *(r = - .156),* violence level *(r = - .092),* group history of trauma *(r = - .123)*, absences *(r = - .181)* and extent of

employee exposure *(r = - .193).* Finally, two index pairs do not correlate significantly: media exposure with injury level *(p = .149)* and group history of trauma *(p = .023)*

Discussion

A lack of strong, positive and consistent correlations between all indices and aggregate severity score raises questions regarding the scale's reliability, indicating the need for further empirical scale analysis. A Cronbach's Alpha test of reliability was therefore applied to the scale.

Cronbach's Alpha

A Cronbach's Alpha was computed for the original nine-item scale. Table 22: Inter-Item Correlation Matrix, shows correlation results for the pairs of scale items.

Table 22: Inter-Item Correlation Matrix
N = 5181

	Employee Involvement	Violence Level	Injury Level	Group History of Trauma	Absence	Exposure Level	Advanced Knowledge	Threat Level	Media Exposure
Employee Involvement									
Violence Level	.255								
Injury Level	-.239	-.139							
Group History of Trauma	.116	.047	-.086						
Absence	.352	.347	-.371	.103					
Exposure Level	.288	.301	-.556	.107	.502				
Advanced Knowledge	.048	.069	.320	-.026	.010	.017			
Threat Level	.141	.212	-.335	.091	.286	.371	.009		
Media Exposure	.265	.246	.008	.008	.260	.107	.160	.114	

Findings

Cronbach's inter-item correlations approximate the Spearman Correlation Coefficient (Rho) and generate a very low Alpha (.315). The inter-item correlations suggest reliability is compromised by three items; injury level, group history of trauma and advanced knowledge of events. Injury and advanced knowledge of event correlate inconsistently to other items both in terms of direction (sometimes positive, sometimes negative) and in terms of strength of the coefficients (sometimes weak, sometimes moderately strong). Group history of trauma correlates inconsistently in terms of direction, while consistently producing weak correlation coefficients.

Initial scale reliability analysis determined empirically that deletion of injury level increases the Alpha from .315 to .607. See Table 23: Item-Total Statistics – First Analysis.

Table 23: Item-Total Statistics - First Analysis
N = 1581

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Employee Involvement	16.65	25.982	.308	.200	.188
Violence Level	18.19	23.012	.351	.187	.132
Injury Level	**17.72**	**39.770**	**-.381**	**.457**	**.607**
Group History of Trauma	19.07	28.618	.091	.025	.306
Absence from Workgroup	18.99	27.759	.404	.360	.189
Exposure Level	17.01	25.775	.196	.466	.241
Advanced Knowledge	15.72	30.779	.206	.180	.269
Threat Level	19.59	30.757	.221	.188	.266
Media Exposure	18.19	30.047	.321	.154	.242

The injury index measures the extent of physical injures incurred. Staff base scoring on the injury and amount of medical attention applied. While the unit theorized that more severe injuries increase the severity of an event, in some cases the extent of medical intervention required many not be identified until sometime post incident, a *consequence* of the incident, rather than a *characteristic* of the incident itself. In addition, there may be inconsistent staff interpretive or scoring practices that result in this index's lack of contribution to scale reliability.

Recalculating item-total statistics for the remaining eight items indicates that deletion of group history of trauma further increases Cronbach's Alpha to .643. See Table 24: Item-Total Statistics – Second Analysis

Table 24: Item-Total Statistics - Second Analysis
N = 5181

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Employee Involvement	14.22	29.822	.394	.188	.546
Violence Level	15.77	27.414	.385	.184	.550
Group History of Trauma	**16.65**	**33.609**	**.120**	**.025**	**.643**
Absence from Workgroup	16.56	31.457	.539	.352	.525
Exposure Level	14.58	26.054	.459	.335	.518
Advanced Knowledge	13.29	38.072	.060	.029	.625
Threat Level	17.17	34.982	.344	.161	.575
Media Exposure	15.77	35.851	.291	.149	.586

In the index for group history, unit staff assesses whether traumatic experiences occurred in the workgroup's history and score incidents based on recentness of prior incidents. While workgroup history for prior trauma is essential practice information that informs services, reliability analysis determined that group history is not empirically related to the severity of an incident. This is possibly due to the fact that workgroup history of trauma is a *workgroup characteristic*, rather than an *incident* characteristic, accounting for the improved Alpha with its deletion from the scale. While workgroup history of trauma may exacerbate employee stress response to a subsequent incident, the

intended purpose of the CrISIS scale is to measure severity of incidents, not impact of event on employees.

Recalculating item-total statistics for the remaining seven items indicates that deletion of advanced knowledge of events again increases Cronbach's Alpha, to .667. See Table 25: Item-Total Statistics – Third Analysis

Table 25: Item-Total Statistics - Third Analysis
N = 5181

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Employee Involvement	13.16	24.390	.391	.183	.594
Violence Level	14.70	21.611	.415	.184	.592
Absence from Workgroup	15.50	25.743	.558	.351	.558
Exposure Level	13.51	20.718	.470	.334	.567
Advanced Knowledge	**12.22**	**31.814**	**.074**	**.029**	**.667**
Threat Level	16.10	29.147	.346	.159	.616
Media Exposure	14.70	29.715	.317	.148	.623

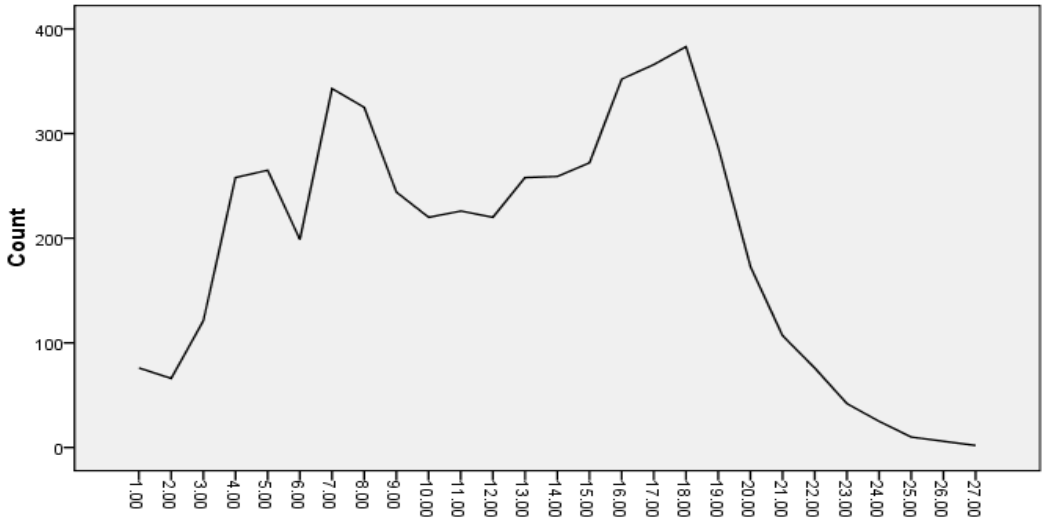
For the advanced knowledge index, staff measures the degree to which employees had notice or warning about an incident and bases the score on employees' perception of anticipation. In theory, an event is less severe if it is anticipated. However, as above, while awareness of a pending stressful event may reduce its impact on individual stress, reliability analysis determined it is not a contributing factor to incident severity. As above, this may be due to the fact that advanced knowledge is a *workgroup characteristic* (employees' degree of prior awareness) rather than a characteristic of an event itself.

Further item deletions do not improve the Cronbach's Alpha beyond .68. While this Alpha is not within the desired range of .8 to .9, precluding support for confidence in scale reliability, it represents a significant improvement for a practice-based, inductively informed scale. More importantly, it now sets the stage for the unit to continue to refine the scale through an empirical approach.

Revised Aggregate Severity Scores

Based on these results, the CrISIS scale was reduced to a six-item scale and scale scores were recalculated based on a range from 0 to 30. Below, Figure 6: Distribution of Revised Incident Severity Scores displays the new distribution graphically and summarizes revised measures of central tendency and dispersion.

Figure 6: Distribution of Revised Incident Severity Scores



Valid	5181
Missing	0
Mean	12.2198
Std. Error of Mean	.07836
Median	13.0000
Mode	18.00
Std. Deviation	5.64039
Variance	31.814

Skewness	-.061
Std. Error of Skewness	.034
Kurtosis	-1.036
Std. Error of Kurtosis	.068
Range	26.00
Minimum	1.00
Maximum	27.00
Sum	63311.00

With the scale revision, the sample's score range is now 26 and the variance is 32. The mean aggregate severity score is 12.21 and the standard deviation is 5.64. The median score is 13 and the modal score is 18. A bi-modal pattern is evident, with spikes for mild and severe incidents. Few incidents occur with extremely low or high scores. While the distribution skews somewhat to the left, Skewness is very low (-.06). The SES is .034. Kurtosis is minimally negative at - 1.0, indicating a distribution less peaked than a normal distribution.

Per the bimodal pattern, since the unit is likely to respond to incidents in the mild and severe ranges, it might consider analyzing the specific needs of organizations under these circumstances and tailoring services to meet them.

Service Delivery Variables

Several *service-delivery variables* are available for descriptive analysis. The first is initial acceptance or declination of on-site services (a dichotomous variable). Next, when organizations implement on-site services, unit staff record information from provider billing invoices, noting the number of groups provided, the number of group attendees, the number of employees counseled individually and the number of managers provided with consultation. Due to the absence of a reliable way to control for organizational size, the *numbers* of the types of on-site services provided are transformed into *whether* the unit provided groups, individual sessions or management consultations (dichotomous versions of the variables). This allows for subsequent valid bivariate and multivariate analyses. Also included is a computed dichotomous variable – whether *at least one of the on-site services* were provided. It is based on a computed continuous variable – total reported on-site services (combining of units of service from all three interventions).

Since follow-up services are an important component of the program, the variables of follow-up completion (dichotomous variables) at two days (Time 1) and four weeks (Time 2), post-incident are analyzed as well.

Initial Decision to Implement On-Site Services. At intake, organizations initially state whether they are willing to implement one or more of the three on-site services (group sessions, individual sessions and management consultations). However, when organizations elect on-site services staff does not capture *which* of the services the organization intended to provide. Table 26: Decision to Implement On-Site Services 2006 - 2008, presents the distribution of these initial decisions.

Table 26: Decision to Implement On-Site Services 2006 - 2008

Decision	# Incidents	%
On-Site Services Accepted	4500	86.9%
On-Site Services Declined	681	13.1%
Total Incidents	5181	100.0%

Followed-up incidents (5,181) divide into those where the organization's initial decision was to accept on-site services (4,500, 86.9%) or decline on-site services (681, 13%). After calling for assistance, the clear majority of organizations accept the offer to deliver on-site services. However, it is important to note that, despite electing to schedule on-site services, not all organizations implement services. This development is discussed next.

Implementation of On-site Services. Despite the majority of organizations initially intending to provide on-site services, due to last minute cancellations or instances where the services remain scheduled but no employees or managers show for assistance, the unit may not implement any on-site services for a given incident. Accounting for actual service delivery dispositions presents a different distribution, one of on-site services *implemented*. The service counts collected by staff allow distinguishing between incidents where the unit implemented at least one of the three services from incidents where it did not implement any on-site services whatsoever. A computed variable, "On-Site Services Implemented" represented this new variable. Table 27: On-Site Services Implemented 2006 -2008, below indicates the number of incidents where the organization actually implemented or did not implement any of the three on-site services.

Table 27: On-Site Services Implemented 2006 - 2008		
	# Incidents	%
On-Site Services Implemented	4337	83.7%
No On-Site Services Implemented	844	16.3%
Total	5181	100.0%

While in 4,500 instances (86%), the organization intended to provide on-site services, unit staff actually implemented at least one type of on-site service for somewhat fewer incidents (4,337, 83.7%). For 844 incidents (16.3%), the unit provided none of the three on-site services. Perhaps, at the time of the call, requestors, reacting to the incident and the immediate crisis, may be more accepting of on-site services. However, as the situation stabilizes, they may decide they do not need them. Of potential interest, is whether other factors, such as incident severity, associate with organizations accepting or declining on-site services and which might associate with organizations eventually receiving or not receiving them.

On-Site Services: Groups, Group Attendees, Individual Sessions and Management Consultations

The unit maintains a specialized network of trained, community-based professional providers (private practitioners and agencies) who deliver all on-site, interventions. During the period under study, the network was composed of 15,532 total providers, including 11,235 social workers. When organizations desire on-site services, coordination staff searches this network for appropriate providers and schedules the services requested. Following delivery of on-site services staff record counts of each of the three services implemented from provider billing invoices. This section details the frequencies of delivery of each service type.

Group Sessions. In general the unit's program theory (Chen, 1996; Chen & Rossi, 1992) prescribes that for potentially traumatic critical incidents, (murder, explosion, hurricane, robbery, etc.) on-site group interventions implemented by the unit's providers should include formal critical incident stress debriefing (or its brief version – defusing), psychological first aid or crisis management briefing. For less severe, organizationally induced crises (downsizing, work stress, workgroup conflicts), prescribed interventions employed include stress reduction groups, conflict management interventions, downsizing support, etc. The unit trains providers on practice standards and distributes manuals to guide all interventions and promote the use of consistent and established protocols. However, the unit staff does not capture or record which type of intervention providers deliver for a specific incident. Further, within the delivery of specific intervention (i.e. CISD vs. PFA), providers remain at liberty to exercise professional discretion and therefore variability in fidelity may occur. Even within types of interventions, there may be differences in emphasis on one or another component technique, such as cognitive restructuring, re-experiencing the event or supportive techniques, blurring categorization of intervention distinctions. Unfortunately, staff does not record information regarding intervention protocols utilized. This results in what some authors refer to as a "black box" of intervention (Hanssen, 2003; Hanssen & Epstein, 2006), on which this clinical data mining study cannot shed any light.

However, from provider reports, unit staff does record the aggregate number of implemented on-site groups for each incident. If the unit delivers multiple groups over several days in multiple locations, the database records the total number of all groups for a given incident. Predominately, each workgroup only receives one group session, not a

sequence of groups. The database, however, does not capture this distinction. It only captures counts of total groups provided per incident, not per workgroup over the course of an incident. Below, Table 28: Number of On-Site Group Sessions 2006 – 2008 (0 to 6+ Group Sessions) shows a reduced distribution of incidents by the number of groups provided for the incident.

Table 28: Number of On-Site Group Sessions 2006 - 2008 (0 to 6+ Group Sessions)

# Groups Delivered	# Incidents	%
0	2133	41.2%
1	2319	44.7%
2	427	8.2%
3	129	2.5%
4	73	1.4%
5	40	0.8%
6 +	60	1.2%
Total Incidents	5181	100.0%
M = .9; SD = 1.4		

For a significant percentage of incidents (2133, 41.2%), no groups were provided. However, more incidents (2319, 44.7%) resulted in one group session. Incidents with no or one group, together account for 85.9% of incidents. After no or one group, there is a significant decline in the number of incidents. For 8.2% of incidents, two groups occurred and the remaining incidents involved three or more groups, accounting for 5.8%. This skews the distribution severely to the right. For the distribution of all values, the mean number of group sessions is .9 and the SD is 1.4. If the number of groups correlates with the scale of the incident, data suggests that most incidents are relatively contained. Such incidents could be an employee death or robbery with relatively few groups needed at one site versus catastrophic incidents (a hurricane or flood) where a high number of groups are provided in multiple locations.

Counts of incidents with various numbers of groups implemented allow for distinguishing between incidents where the unit provided on-site groups from those where it did not. By recoding incident values of zero groups to “No Group Sessions provided” and incidents with one or more groups to “Group Sessions Provided”, the variable “Number of On-Site Group Sessions” transforms into a new dichotomous variable, “Provision of On-Site Group Sessions”. Table 29: Provision of On-Site Group Sessions 2006 -2008, details this breakdown.

Table 29: On-Site Group Sessions Implemented 2006 - 2008

	# Incidents	%
Group Sessions Implemented	3048	58.8%
No Group Sessions Implemented	2133	41.2%
Total	5181	100.0%

For 2133 incidents (41.2%), the unit implemented no on-site group sessions. Critical incident practice suggests possible explanations. In most cases, attendance is voluntary and organizations will often schedule groups immediately after the incident – overestimating impact and need, without assessing whether employees need them or if they are willing to attend. Despite the provider being on site, employees may not attend. Additionally, if incidents are not severe and employees seem to be adjusting well, the organization may later perceive minimal benefits derive from the costs and organizational resources required to provide the groups and cancel them. Another interpretation is if the relationship between employees and management is problematic, an incident may exacerbate tensions and employees may refuse to attend out of resentment. Further, the organization may be considering liability or public relations needs that on-site providers address, whether employees attend or not. For the majority of incidents in the sample,

Table 29 above shows the unit implemented on-site groups for 3,048 incidents (58.8%).

Group Attendees. From provider reports on employee attendance at groups, unit staff records the aggregate number of attendees per incident. If the unit delivers multiple groups over several days in multiple locations, the database records the total attendees for all groups for that incident. Table 30: Number of On-Site Group Attendees 2006 - 2008 (0 to 21+ Group Attendees) displays a reduced distribution. Note that no incidents with one employee attending are included. Staff reports incidents with one attendee under *individual sessions*, not under groups.

Table 30: Number of On-Site Group Attendees 2006 - 2008 (0 to 21+ Group Attendees)

# Attendees	# Incidents	%
0	2133	41.2%
2	150	2.9%
3	186	3.6%
4	175	3.4%
5	205	4.0%
6	282	5.4%
7	278	5.4%
8	238	4.6%
9	175	3.4%
10	206	4.0%
11	109	2.1%
12	135	2.6%
13	74	1.4%
14	76	1.5%
15	85	1.6%
16	46	0.9%
17	35	0.7%
18	42	0.8%
19	23	0.4%
20	57	1.1%
21+	471	9.1%
Total Incidents	5181	100.0%
	M = 9.2; SD = 27	

As expected from the number of incidents with no on-site *groups* above, the same

number of incidents (2133) has no group *attendees*, again comprising 41.2% of the sample incidents. The distribution of the remainder of incidents, as a new total (N = 3048), is as follows: incidents with 2 to 10 attendees accounted for 36.2% and incidents with 11 to 20 attendees account for 16.2% of incidents. Incidents with 21 or more attendees comprise 9.1%. After the extremely high number of incidents with no group attendees, the number of incidents decreases sharply at two attendees, but then the number of incidents generally increases from two to ten attendees. After the increase, the number of incidents generally decreases for 11 or more higher. This skews the distribution severely to the right. For the distribution of incidents and number of group attendees for all values, the mean number of attendees is 9.2 and the SD is 27. This is consistent with the similar analysis of the number of groups above.

Individual Sessions. While individual sessions can be scheduled independently of groups or even in place of them, normally on-site providers deliver them as a follow-up to group sessions. During group sessions, providers assess for individuals exhibiting extreme duress and following the groups, they offer to stay and counsel anyone who would like an individual session. The approaches utilized in individual sessions include crisis intervention, rapid stabilization and motivational counseling, targeting facilitating employee acceptance of a referral for ongoing assistance. From provider reports of counts of on-site individual sessions provided, unit staff records the total number for each incident. Typically, employees receive no more than one session on the day the provider is on site. Multiple sessions with the same employee, while possible are rare and unit records do not capture those. Table 31: Number of On-Site Individual Sessions 2006 - 2008 (0 to 17+ Individual Sessions) below, displays a reduced distribution of incidents by

the number of individual sessions provided.

Table 31: Number of On-Site Individual Sessions 2006 - 2008
(0 to 17+ Individual Sessions)

# Sessions	# Incidents	%
0	2239	43.2%
1	935	18.0%
2	596	11.5%
3	386	7.5%
4	291	5.6%
5	175	3.4%
6	146	2.8%
7	75	1.4%
8	62	1.2%
9	43	0.8%
10	38	0.7%
11	23	0.4%
12	25	0.5%
13	15	0.3%
14	18	0.3%
15	15	0.3%
16	12	0.2%
17+	87	1.7%
Total Incidents	5181	100.0%
M = 2.4; SD = 8.4		

As the number of sessions increases, the number of incidents with that number of sessions decreases. The unit provided no on-site individual sessions for 2239 incidents (43.2%, the clear majority). Incidents with one individual session (935) account for 18.0%, followed by two sessions (596, 11.5%), three sessions (386, 7.5%) and four sessions (291, 5.6%). Incidents with between none to four sessions account for 85.8% of incidents. Incidents with between five and 16 sessions account for 12.5% of incidents. Consistent with this pattern, 98.3% of incidents involved 16 sessions or less. Incidents with 17 or more session account for only 1.7% of incidents. This skews the distribution severely to the right. The mean number of individual sessions is 2.4 and the SD is 8.4.

Counts of individual sessions by incident allow for distinguishing between incidents where the unit provided one or more individual employee sessions from incidents involving no individual sessions. Using this approach, the variable, "Number of On-Site Individual Sessions" was transformed into a new, dichotomous variable, "Provision of On-Site Individual Sessions" by recoding incident values of zero individual sessions to "No Individual Sessions Provided" and incidents with one or more sessions to "Individual Sessions Provided". Table 32: On-Site Individual Sessions Implemented 2006 - 2008 details the breakdown.

Table 32: On-Site Individual Sessions Implemented 2006 - 2008

	# Incidents	%
Individual Sessions Implemented	2942	56.8%
No Individual Sessions Implemented	2239	43.2%
Total	5181	100.0%

On-site providers counseled individual employees in 56.4% of incidents. For 2239 incidents, the unit provided no individual sessions (43.6%).

Management Consultations. The objective of management consultations is to assist managers in responding to workgroup behavior in the aftermath of a traumatic event. Typically, consultations consist of education on normal reactions to trauma, a review of expectations for returning to routine performance relative to the severity of the incident and reminders of procedures in place to refer employees to the EAP. Normally, unit staff does not schedule management consultations ahead of time, as they do for groups. Consultations instead usually evolve from the interaction of on-site providers with managers while delivering group sessions. Rarely are such consultations the only

service provided. From data reported by providers, unit staff records the number of management consultations provided on-site for each incident. Below, Table 33: Number of On-Site Management Consultations 2006 - 2008 (0 to 7+ Consultations) displays a reduced distribution of incidents by the number of management consultations provided, including incidents with no consultations.

Table 33: Number of On-Site Management Consultations 2006 - 2008 (0 to 7+ Consultations)

# Consultations	# Incidents	%
0	2201	42.5%
1	1444	27.9%
2	804	15.5%
3	304	5.9%
4	168	3.2%
5	77	1.5%
6	50	1.0%
7+	133	2.6%
Total Incidents	5181	100.0%
M = 1.3; SD = 3.1		

The unit provided no on-site management consultations for 2201 incidents (42.5%) and one consultation for 1444 (27.9%). Among the remaining incidents, the following frequencies are observed: incidents with two consultations (15.5%), incidents with between three and six consultations (11.6%) and incidents with seven or more consultations (2.6%). Generally, as the number of consultations increase, the number of incidents decrease. Consistent with this pattern, 97.4% of incidents involved six consultations or less. After an extremely high number of incidents with no consultations, the number of incidents decreases sharply with one consultation, after which the number of incidents continues to steadily decline. This skews the distribution severely to the

right. For the distribution of incidents, the mean number of consultations is 1.3 and the SD is 3.1.

Counts of consultations by incident allow for distinguishing between incidents where the unit provided consultations from those where it did not. Using this approach, the variable, “Number of On-Site Management Consultations” was transformed into a new dichotomous variable, “Provision of On-Site Management Consultations” by recoding incident vales of zero consultations to “No Management Consultations Provided” and incidents with one or more sessions to “Management Consultations Provided”. Table 34: Management Consultations Implemented 2006 -2008 details this breakdown.

Table 34: Management Consultations Implemented 2006 - 2008

	# Incidents	%
Management Consultations Implemented	2980	57.5%
No Management Consultations Implemented	2201	42.5%
Total	5181	100.0%

The unit provided consultations for 2980 incidents (57.5%) while delivering no consultations for 2201 incidents (42.5%). The next section discusses data for two computed variables, combining all three services into a count of total units of service.

Total On-Site Services. A new variable, “Total Reported On-Site Services” was computed by calculating the sum of all provided employee services. A provided employee service is defined as an employee receiving at least one of the three on-site services available (an employee attends a group, receives an individual session or a manager receives consultation). This measure includes all services provided over the

entire course of the organizational response in the days subsequent to the incident. This variable measures provided *units of service,* not unique users or individuals served. Individual employees may receive more than one of the services. From provider reports, staff record counts of total services provided by incident. Below, Table 35: Total Reported On-Site Services 2006 - 2008 (0 to 21+ Total Services) displays a reduced distribution of incidents with total provided employee services.

Table 35: Total Reported On-Site Services 2006 - 2008 (0 to 21+ Total Services)

Service Units	# Incidents	%
0	844	16.3%
1	223	4.3%
2	271	5.2%
3	263	5.1%
4	277	5.3%
5	243	4.7%
6	278	5.4%
7	289	5.6%
8	259	5.0%
9	223	4.3%
10	216	4.2%
11	183	3.5%
12	173	3.3%
13	149	2.9%
14	120	2.3%
15	111	2.1%
16	93	1.8%
17	75	1.4%
18	62	1.2%
19	48	0.9%
20	60	1.2%
21+	721	13.9%
Total Incidents	5181	100.0%
M = 13.0; SD = 31.8		

The unit provided no on-site services for 844 incidents (16.3%). Incidents for which the unit provided between one and twelve total services fluctuated between representing 3% to 6 % of incidents, indicating the number of incidents fluctuates as the number of services increases from one to twelve. For 13 to 20 total services, incidents then fall into a trend where the number of incidents generally declines as the number of total services increases. Consistent with this pattern, 72.2% of incidents involved 12 units of service or less, 13.9% received between 13 and 20 units of service and another 13.9% involved 21 or more services. This skews the distribution severely to the right. For total on-site services, the mean units of service are 13.04 and the SD at 31.84.

On-Site Services: Statistical Summary. Table 36: On-Site Services: Measures of Central Tendency and Dispersion provides a summary of the basic statistics for the five continuous measures of on-site services.

Table 36: On-Site Services: Measures of Central Tendency and Dispersion (All Values)

Service	Mean	Median	Range	Variance	SD	Skew	SES	Kurtosis
# Group Sessions	0.9	1.0	42.0	2.0	1.4	8.6	0.034	174.7
# Group Attendees	9.2	4.0	1101.0	734.1	27.1	19.6	0.034	638.3
# Individual Sessions	2.5	1.0	435.0	70.9	8.4	30.2	0.034	1401.5
# Manager Consultations	1.4	1.0	115.0	9.9	3.1	17.3	0.034	500.8
Total On-Site Services	13.0	7.0	1109.0	1014.2	31.8	17.1	0.034	464.0

From examining the mean service counts, on average the unit provided one group session with approximately nine attendees. There is typically two to three individuals counseled separately from groups, most probably employees in significant distress. On average between one and two managers engage the on-site provider for consultation on post-incident employee management. Standard deviations indicate that number of groups and management consultations vary less widely than the number of groups and individual

sessions. In contrast, the number of group attendees and total units of service vary significantly. Since group attendees account for most of the total service units, predictably, the high variance for group attendees also drives the high variance in total units of service as well. Kurtosis and Skewness indicate the same pattern for all measures – distributions that are peaked and skewed severely from left to right.

While on-site services are a critical component of the program, it is important to note that neither the initial decision regarding acceptance of on-site services nor the eventual delivery or non-delivery of on-site services preclude the unit staff from providing telephonic follow up services, discussed in the next section.

Follow-Up Services Completion. Follow-up services are completed through timed outreaches to the affected organization, conducted within two days post incident (follow-up phase one), and within four weeks (follow up phase two). For organizations accepting follow-up service, the unit's computerized system automatically generates a follow-up schedule for staff. For non-responders, the team makes three attempts to reach the previously identified site observers. Unit staff record the outcome of whether they completed telephonic follow-up services at phases one and two. Table 37: Follow-Up Services & Survey Completion Rates Post-Incident: 2006 – 2008 displays two-day and four-week follow up results.

Table 37: Follow-Up Services & Survey Completion Rates Post-Incident: 2006 - 2008

		# Incidents	%
Two Days Post-Incident Time 1	Follow-Up Completed	4434	85.6%
	Follow-Up Not Completed	747	14.4%
	Total Incidents	5181	100.0%
Four Weeks Post-Incident Time 2	Follow-Up Completed	3442	66.4%
	Follow-Up Not Completed	1739	33.6%
	Total Incidents	5181	100.0%

Telephonic follow-up support and survey completion rates are initially quite good (85.6%) and then decline some by the second follow-up (66.4%). The decline in follow-up at four-weeks may relate to a lack of response from the client organization contacts, other distracting circumstances, an incident of low severity or a perception that organizational recovery progressed to a level where further contact with the unit was unnecessary. Of potential interest is exploring which factors available in the database, such as incident severity, might associate with whether follow-up is completed.

Outcome Variables

The dependent variable of workgroup performance restoration, central to organizational resilience, is included in the descriptive analysis as measured at two days (Time 1) and four weeks (Time 2) on an ordinal scale. Two ordinal satisfaction measures – perceived helpfulness of services for employees and perceived helpfulness of services for management are included along with an ordinal measure of the site observer's satisfaction with the adequacy of their organization's overall response to the incident. Whether employees remain within the organization, remain within the affected

workgroup or sustain attendance, (dichotomous variables) have important implications for organizational continuity as well and are therefore, included as dependent variables.

Performance Restoration Post-Incident. At two days (Time 1) and four weeks (Time 2), staff surveys workgroup observers for their perception of whether workgroup performance returned to levels observed before the incident. "Would you agree or disagree that employees have returned to the same level of functioning as before the critical incident?" Table 38: Perception of Performance Restoration Post-Incident: 2006 – 2008 (Original Scale) shows the results.

Table 38: Perception of Performance Restoration Post-Incident: 2006 - 2008

	(Original Scale)	# Incidents	%	Valid %
Two Days	5 - Strongly Agree	145	2.8%	3.5%
Post-Incident	4 - Agree	1542	29.8%	37.6%
Time 1	3 - Somewhat Agree	1613	31.1%	39.5%
	2 - Somewhat Disagree	508	9.8%	12.4%
	1 - Disagree	231	4.5%	5.6%
	0 - Strongly Disagree	58	1.1%	1.4%
	Valid Total	4097	79.1%	
	Missing	1084	20.9%	
	Total Incidents	5181	100.0%	100.0%
Four Weeks	5 - Strongly Agree	595	11.5%	17.8%
Post-Incident	4 - Agree	2122	41.0%	63.3%
Time 2	3 - Somewhat Agree	514	9.9%	15.3%
	2 - Somewhat Disagree	78	1.5%	2.3%
	1 - Disagree	30	0.6%	0.9%
	0 - Strongly Disagree	12	0.2%	0.4%
	Valid Total	3351	64.7%	
	Missing	1830	35.3%	
	Total Incidents	5181	100.0%	100.0%
	T1: M = 3.2 ; SD = 1.0 T2: M = 3.9; SD = .7			

At two days post-incident, for incidents with recorded data, 41.1% of observers at least agree (strongly agree or agree) that workgroup performance restored to levels observed prior to the incident. At four weeks, agreement increases to 81.1%. Comparing the combined ambivalent response categories (somewhat agree, somewhat disagree) for

the two timeframes, reveals that while 51.8% of observers were ambivalent at the two day follow-up, ambivalence about performance decreased to 17.6% at four weeks. Observers also decreasingly perceive performance as not restored (disagree, strongly disagree) from two days (7.0%), to four weeks (1.3%). For T1, the mean performance score is 3.2 and the SD is 1.0. For T2, the mean is 3.9 and the SD is .7. Practice wisdom suggests and results confirm that workgroup performance at four weeks post incident is much less compromised than at two days. This is consistent with what is known about the course of trauma response and recovery. In workplace practice, immediately post incident, workgroups typically exhibit a mix of reactions - normal stress responses and acute stress disorders (ASD). Symptoms such as re-experiencing the event, avoidance behavior, increased arousal and functional impairments are common. ASD resolves within four weeks for most employees (APA, 2000; Breslau et al., 1998; Harvey & Bryant, 1998).

A dichotomous variable was created to address cell frequency violations for Cross Tabulation. All “agree” categories were combined as “Performance Restored” and all the “disagree” categories were combined as “Performance Not Restored”. Results are presented in Table 39: Perception of Performance Restoration Post-Incident: 2006 – 2008, Dichotomous Version.

Table 39: Perception of Performance Restoration Post-Incident: 2006 - 2008

Dichotmous Version		# Incidents	%	Valid %
Two Days Post-Incident Time 1	Performance Restored	3300	63.7%	80.5%
	Performance Not Restored	797	15.4%	19.5%
	Valid Total	4097	79.1%	
	Missing	1084	20.9%	
	Total Incidents	5181	100.0%	100.0%
Four Weeks Post-Incident Time 2	Performance Restored	3231	62.4%	96.4%
	Performance Not Restored	120	2.3%	3.6%
	Valid Total	3351	64.7%	
	Missing	1830	35.3%	
	Total Incidents	5181	100.0%	100.0%

While at two days, performance restores in 80.5% of workgroups, the percent restored at four weeks improves to 96.4%. Very few workgroups fail to restore after four weeks.

Performance Restoration: Statistical Summary. Table 40: Performance Restoration Scores: Measures of Central Tendency and Dispersion, provides a summary of the basic statistics for the ordinal measures of performance restoration.

Table 40: Performance Restoration Scores: Measures of Central Tendency and Dispersion (Original Scale)

	Mean	Median	Range	Variance	SD	Skewness	SES	Kurtosis
Performance Restored T1	3.16	3.00	5.00	0.96	0.98	-0.83	0.038	0.72
Performance Restored T2	3.93	4.00	5.00	0.55	0.74	-1.26	0.042	4.07

Observers perceive and report performance restoration improvement from two days post-incident to four weeks post-incident. In the original scale, at T1, the mean score occurs at slightly higher than “somewhat agree” and at T2, the mean score occurs at just below “agree”.

Employee Retention and Attendance Post-Incident. Staff surveyors ask three attendance-related questions - about resignation from the organization, transfers out of

the workgroup and extended leaves of absence. The questions are: “Have any employees resigned because of the critical incident?” “Have any employees transferred because of the critical incident?” “Are you aware of any attendance issues such as disability, leave of absence, FMLA, lateness, etc? Other than those employees who resigned or transferred, have all employees returned to the workgroup?” Table 41: Employee Retention and Attendance Post-Incident: 2006 – 2008, shows the results.

Table 41: Employee Retention and Attendance Post-Incident: 2006 - 2008

		# Incidents	%	Valid %
Retention within the Organization Post-Incident	Retained	3294	63.6%	96.2%
	Resignation	130	2.5%	3.8%
	Valid Total	3424		
	Missing	1757	33.9%	
	Total Incidents	5181	100.0%	100.0%
Retention within the Affected Workgroup Post-Incident	Retained	3327	64.2%	97.2%
	Transfer to Other Department	95	1.8%	2.8%
	Valid Total	3422		
	Missing	1759	34.0%	
	Total Incidents	5181	100.0%	100.0%
Sustained Attendance within Affected Workgroup Post-Incident	Sustained Attendance	3192	61.6%	94.5%
	Extended Leave	186	3.6%	5.5%
	Valid Total	3378		
	Missing	1803	34.8%	
	Total Incidents	5181	100.0%	100.0%

In terms of retention within the organization, for incidents with recorded data, the majority of incidents (96.2%) result in the entire workgroup remaining with the organization and returning to work, with very few incidents (3.8%) resulting in at least one resignation from the workgroup. Similarly, the majority of incidents (97.2%) associate with employees remaining within the affected workgroup vs. those where an employee transferred to another part of the organization (2.8%).

In terms of attendance, all employees were regularly attending work in 94.5% of incidents. Only in 5.5% of incidents was at least one employee on an extended leave of some kind (disability, workers compensation, extended unexcused absence, etc.). Missing incident data for resignations, transfers and leaves are similarly high (1757, 1759 and 1803 incidents respectively).

Helpfulness of Interventions to Employees. At two days post-incident, staff inquires of the observer, "How helpful were on-site services to employees?" Staff records the results into an ordinal scale. Table 42: Helpfulness of Intervention to Employees: 2006 – 2008 (Original Scale) shows the results.

Table 42: Helpfulness of Services to Employees: 2006 - 2008

(Original Scale)	# Incidents	%	Valid %
4 - Very Helpful	1720	33.2%	46.0%
3 - Helpful	1869	36.1%	49.9%
2 - Somewhat Helpful	83	1.6%	2.22%
1 - Not Very Helpful	39	0.8%	1.04%
0 - Not Helpful	31	0.6%	0.83%
Valid Total	3742	72.2%	
Missing	1439	27.8%	
Total Incidents	5181	100.0%	100.0%
M = 3.4; SD = .6			

The significant majority of responses fall in the very helpful or helpful categories and very few incidents resulted in not helpful or not very helpful ratings. The mean employee helpfulness score in the original five-point scale (0 to 4) is 3.4 and the SD is .6.

A dichotomous variable was created to address cell frequency violations for Cross Tabulation. The top category (Very Helpful) was retained and the remaining categories were combined into "Less than Very Helpful". Results are presented in Table: 43: Helpfulness of Services to Employees: 2006 - 2008, Dichotomous Version.

Table 43: Helpfulness of Services to Employees: 2006 - 2008

Dichotomous Version	# Incidents	%	Valid %
Very Helpful	1720	33.2%	46.0%
Less than Very Helpful	2022	39.0%	54.0%
Valid Total	3742	72.2%	
Missing	1439	27.8%	
Total Incidents	5181	100.0%	100.0%

Site observer's perception of the helpfulness of services for employees roughly splits between the two categories. They perceived services were very helpful for 46% of workgroups and less than very helpful for 54%.

Helpfulness of Interventions to Management. At two days post-incident, staff inquires of the observer, "How helpful were on-site services to management?" Staff records the results into an ordinal scale. Table 44: Helpfulness of Intervention to Management: 2006 – 2008 (Original (Scale), shows the results.

Table 44: Helpfulness of Services to Management: 2006 - 2008

(Original Scale)	# Incidents	%	Valid %
4 - Very Helpful	1620	31.3%	43.5%
3 - Helpful	1949	37.6%	52.3%
2 - Somewhat Helpful	83	1.6%	2.2%
1 - Not Very Helpful	38	0.7%	1.0%
0 - Not Helpful	38	0.7%	1.0%
Valid Total	3728	72.0%	
Missing	1453	28.0%	
Total Incidents	5181	100.0%	100.0%
M = 3.3; SD = .6			

Similar to the pattern observed for employees, overwhelmingly, services are seen as helpful or very helpful for management and again, very few ratings occur in the not helpful range. The mean employee helpfulness score in the original five-point scale (0 to 4) is 3.3 and the SD is .6.

A dichotomous variable was created to address cell frequency violations for Cross Tabulation. The top category (Very Helpful) was retained and the remaining categories were combined into “Less than Very Helpful”. Results are presented in Table: 45: Helpfulness of Services to Management: 2006 - 2008, Dichotomous Version.

Table 45: Helpfulness of Services to Management 2006 - 2008

Dichotomous Version	# Incidents	%	Valid %
Very Helpful	1620	31.3%	43.5%
Less than Very Helpful	2108	40.7%	56.5%
Valid Total	3728	72.0%	
Missing	1453	28.0%	
Total Incidents	5181	100.0%	100.0%

Site observer’s perception of the helpfulness of services for management also roughly splits between the two categories. Observers perceived services were very helpful for 43.5% of workgroups and less than very helpful for 56.5%.

Observer’s Perception of Adequacy of Organizational Response. Staff follows up four weeks post-incident to inquire of the observer, “How satisfied are you with your organization’s response to this event? Please comment on the reason if poor or unacceptable”. Table 46: Perception of Adequacy of Organizational Response: 2006 - 2008 (Original Scale), reports the results.

Table 46:

Perception of Adequacy of Organizational Response: 2006 -2008

(Original Scale)	# Incidents	%	Valid %
Excellent response	392	7.6%	13.7%
Very good response	1498	28.9%	52.4%
Satisfactory response	948	18.3%	33.2%
Poor response	17	0.33%	0.6%
Unacceptable response	2	0.04%	0.1%
Total	2857	55.1%	
Missing	2324	44.9%	
Total Incidents	5181	100.0%	100.0%

Organizational observers reported their organization's response as "excellent" for 392 incidents (13.7%). Slightly more than half (52.4%) perceived the response as "very good" and a third (33.2%) as "satisfactory". The mean score is 2.7 and the SD is .6. A dichotomous variable was created to address cell frequency violations for Cross Tabulation. The top two categories (excellent and very good) were combined into "Highly Adequate Response". The remaining categories were combined into 'Less than Highly Adequate Response". Results are presented in Table: 47: Perception of Adequacy of Organizational Response: 2006- 2008, Dichotomous Version.

Table 47:

Perception of Adequacy of Organizational Response: 2006 -2008

Dichotomous Version	# Incidents	%	Valid %
Highly Adequate Response	1890	36.5%	66.2%
Less than Highly Adequate Response	967	18.7%	33.8%
Total	2857	55.1%	
Missing	2324	44.9%	
Total Incidents	5181	100.0%	100.0%

Site observer's perceive the adequacy of their organization's response to be highly adequate for 66.2% of workgroups and less so for 33.8%.

Summary of Univariate Findings

This descriptive analysis reveals the CISM unit's records house credible data on several variables identified in the literature as relevant to organizational resilience. Taken together, the frequency distributions reported for organizations served by unit reveal common incident characteristics, typical services delivered and predictable organizational outcomes. The most typical incident was a death (44%) or a criminal act

(38%) occurring within a finance (40%) or retail trade setting (19%) and within a workgroup not experiencing a previous trauma within the past twelve months (81%). Incident severity, as measured on the revised, 30-point CrISIS scale, indicated a score range of 26 and a mean score of 12.2. A bi-modal distribution is evident, with the majority of incidents falling in the severe or mild range. Post incident, most organization's initial decision was to accept on-site services (87%) and nearly as many implemented at least one on-site service (84%). For most incidents, the organization implemented on-site groups (59%), individual counseling sessions (56%) and management consultations (58%). Organizations usually completed follow up at both two days (87%) and four weeks (66%). In terms of outcomes, workgroup performance typically restored at both two days (81%) and four weeks (96). Post incident, employees remained within the organization (96%), remained within the affected workgroup (97%) and sustained attendance (95%). Organizational observers perceived services were helpful at the highest level for employees (46%) and management (44%) and that their organization responded highly positively to the incident (66%).

This descriptive analysis confirmed the unit's data on several variables is suitable for further analysis. The next chapter covers the bivariate research design, analysis and findings.

Chapter Four

Bivariate Analyses

Traumatic Incidents, Services and Organizational Outcomes

As noted in chapter two, the approach to analyzing relationships between pairs of independent and dependent variables in the database is informed by several influences. First, the literature review completed in chapter one identified relevant variables related to organizational resilience to workplace trauma. Second, I perceived variables could be organized into variable groupings that align with the temporal sequence of events preceding an incident, occurring during and after the incident and eventual organizational outcomes. Third, several variables contained within the CISM unit's database fall into these variable groups. CISM database variables include a *pre-incident variable* (prior workgroup trauma), *incident related variables* (type of industry, type of incident and incident severity), *service delivery variables* (initial organizational decision for on-site services, implementation of on-site groups, individual sessions and management consultations), and *organizational outcome variables* (workgroup performance restoration two days and four weeks post incident, employee retention within the organization, employee retention within the affected workgroup, sustained employee attendance, services helpfulness for employees and management and the adequacy of organizational response to the event). These outcome variables all represent components of the concept – organizational resilience. These groups of variables frame the questions of interest, which ask how predictor variables impact outcome variables. This chapter

reports the results of multiple bivariate analyses. These results then inform selection of both independent and outcome variables to include in multivariate analyses.

To explore these associations, appropriate statistical tests were employed. To achieve valid χ^2 tests (i.e. results with less than 20% of cells with expected count less than 5), categories for five outcome variables had to be collapsed, creating dichotomous variables (workgroup performance at two days and four weeks, service helpfulness for employees and management and adequacy of organizational response). Despite category reduction, for some relationships, valid χ^2 tests could still not be achieved. Additional statistical tests employed include t-test and Analysis of Variance (ANOVA). The level of statistical significance targeted in all tests is $p < .05$. Summary tables are displayed for all results. Findings are reported for valid tests and analysis is provided for significant associations with sizeable strengths of association or for unexpected findings.

First, it will be useful to review the survey used to collect organizational outcome data. For performance restoration at two days and four weeks post-incident, staff surveys workgroup observers for their perception of whether workgroup performance returned to levels observed before the incident. “Would you agree or disagree that employees have returned to the same level of functioning as before the critical incident?” Retention and attendance are assessed through the following questions. “Have any employees resigned because of the critical incident?” “Have any employees transferred because of the critical incident?” “Are you aware of any attendance issues such as disability, leave of absence, FMLA and lateness?” For service helpfulness for employees vs. management, at two days post-incident, staff inquires of the observer, “How helpful were on-site services to employees?” “How helpful were on-site services to management?” Finally, for the

outcome of perception of adequacy of organizational response, staff follows up four weeks post-incident to inquire of the observer, “How satisfied are you with your organization’s response to this event?”

Pre-Incident Phase Analysis

Prior Workgroup Trauma. As noted in chapter two, over the three-year period, 848 workgroups (16.4%) experienced a previous traumatic incident. Cross-tabulations and Chi-squares are presented in Table 48: Organizational Outcomes by Prior Workgroup Trauma, which explores relationships between prior workgroup trauma and eight organizational outcomes post-intervention. Where appropriate, Kendall’s tau-c is presented as an indicator of strength and direction of association between prior trauma and organizational outcomes.

Table 48: Organizational Outcomes by Prior Workgroup Trauma

		Cross Tabulation %		χ^2 Results	Kendall's tau
		Prior Trauma N = 848	No Prior Trauma N = 3539		
a.	Performance Restoration at Two Days Post Incident	76.0%	81.5%	$\chi^2(1,3967) = 11.613$, $p = .001$	tau c = .034; $p = .011$
b.	Performance Restoration at Four Weeks Post Incident	95.3%	96.7%	$\chi^2(1,3027) = 2.701$, $p = .100$	
c.	Employee Retention within the Organization	93.8%	96.5%	$\chi^2(1,3092) = 8.824$, $p = .003$	tau c = .017; $p = .011$
d.	Employee Retention within Affected Workgroup	95.9%	97.5%	$\chi^2(1, 3090) = 4,184$, $p = .041$	tau c = .010; $p = .074$
e.	Affected Employees Sustain Attendance	93.1%	94.8%	$\chi^2(1,3053) = 2.518$, $p = .113$	
f.	Positive Perception of Service Helpfulness for Employees	97.0%	98.3%	$\chi^2(1, 1841) = 2.359$, $p = .125$	
g.	Positive Perception of Service Helpfulness for Management	97.2%	98.2%	$\chi^2(1, 3523) = 2.543$, $p = .111$	
h.	Perception of a Highly Adequate Organizational Response	60.0%	67.4%	$\chi^2(1, 2601) = 9.549$, $p = .002$	tau c = .045; $p = .003$

Findings. For all tests, there is an inverse relationship between the experience of a prior organizational trauma and positive program outcomes. Based on Chi-square results half are statistically significant. However, the effect sizes, even for the most significant are negligible. For example, performance restored at two days in 76% of workgroups with prior trauma, compared to 82% without and while the difference is significant, $\chi^2(1,3967) = 11.613, p = .001,$ Kendall's tau is *.034.* Prior trauma is also found to significantly impact both retention within the organization post incident, $\chi^2 (1, 3092) = 8.824, p = .003$, (94% with prior trauma, 97% without) and retention within the affected workgroup, $\chi^2(1, 3090) = 4,184, p = .041,$ (96% with prior trauma, 98% without). Prior

trauma significantly influences whether the organization is perceived to have responded highly adequately to the workgroup's traumatic event, $\chi^2(1, 2601) = 9.549, p = .002$ (60% with prior trauma, 67% without). However, Kendall's tau c is very low for all four associations *(034, .017, .010 and .045)*. Prior trauma is not significant for performance at four weeks, $\chi^2 (1,3027) = 2.701, p = .100,$ whether employees sustain consistent attendance, $\chi^2 (1, 3053) = 2.518, p = .113,$ whether critical incident services were perceived as helpful to employees, $\chi^2(1, 1841) = 2.359, p = .125$ or helpful to management, $\chi^2(1, 3523) = 2.543, p = .111$.

Discussion. No meaningful associations are observed between prior trauma and the outcome variables. All findings reflect either non-significance or significance with negligible effect sizes. Of note however, is that while observed differences in percents are significant for performance restoration at two days, they are not significant at four weeks. While the largest observed difference (7%) occurs for whether the organization is perceived to have responded highly adequately to the workgroup's traumatic event and the difference is statistically significant, another weak effect size diminishes the finding. Since organizations hold themselves (or communities hold them) accountable to adequately responding to workplace trauma, it would be useful for organizations to know whether their critical incident response is viewed more or less adequately with repetitive workgroup incidents. Further research could further explore both this question and how repetitive incidents affect other organizational outcomes.

Incident Phase Analysis

Industry Type. As noted in chapter one, certain employment settings are at higher risk for traumatic incidents (Rick et al., 1998). The industries most represented in the CISM unit data include finance/insurance, wholesale/retail trade, construction/ manufacturing/mining and health/education/social services. Table 49: Organizational Outcomes by Industry Type presents a Chi-square analysis.

Table 49: Organizational Outcomes by Industry Type

		Industry Category								
	Organizational Outcome	Construction, Manufacturing and Mining N = 558	Finance and Insurance N = 2055	Health, Education Social Service N = 301	Professional, Scientific & Technical N = 269	Public Adminis-tration N = 230	Real Estate, Rental and Leasing N = 67	Trade - Wholesale and Retail N = 985	Travel and Leisure N = 253	Utilities N = 177
a.	Performance Restoration, Two Days	79.2%	83.7%	80.9%	80.1%	70.6%	83.9%	78.5%	80.6%	64.5%
		$\chi^2(9, 4097) = 48.128, p = .000$								
b.	Performance Restoration, Four Weeks	96.6%	96.2%	94.7%	96.4%	95.8%	97.8%	97.2%	95.9%	94.3%
		$\chi^2(9, 3351) = 6.293, p = .710$								
c.	Retention in Organization	96.6%	95.2%	97.6%	95.8%	100.0%	95.7%	96.3%	95.2%	98.1%
		$\chi^2(9, 3424) = 15.561, p = .077$								
d.	Retention in Affected Workgroup	97.3%	96.8%	98.2%	98.6%	98.6%	89.1%	96.8%	98.6%	99.1%
		Invalid Test								
e.	Sustained Attendance	93.5%	94.6%	95.3%	94.5%	96.5%	93.4%	93.6%	95.2%	94.4%
		$\chi^2(9, 3378) = 3.635, p = .934$								
f.	Positive Service Perception: Employees	98.5%	97.6%	95.1%	97.4%	98.7%	95.2%	98.9%	100.0%	98.6%
		Invalid Test								
g.	Positive Service Perception: Management	99.0%	96.8%	98.5%	98.4%	97.0%	100.0%	91.1%	97.6%	99.3%
		Invalid Test								
h.	Highly Adequate Organizational Response	65.3%	63.1%	68.3%	66.4%	67.5%	76.9%	68.8%	72.5%	63.9%
		$\chi^2(9, 2857) = 17.123, p = .047$								

Findings. Whether workgroups restored to previous performance by two days post-incident differed significantly by industry type, $\chi^2(9, 4097) = 48.128, p = .000$. Performance restored at two days most frequently in finance/insurance and real estate/rental/leasing (84% of incidents) and health/education/social services and travel/leisure (81%). Performance restored lest frequently in utilities (65%). Perception of whether the organization responded adequately to the workgroup's traumatic event also differed significantly by type of industry, $\chi^2(9, 2857) = 17.123, p = .047$. For workgroups in the real estate/rental/leasing industry, 77% of organizations were perceived as responding highly adequately, compared to 63% in finance/insurance.

Type of industry had no impact on performance restoration by four weeks, $\chi^2(9, 3351) = 6.293, p = .710,$ on employee retention within the organization, $\chi^2(9, 3424) = 15.561, p = .077$ and no impact on whether employees sustained attendance post incident, $\chi^2 (9, 3378) = 3.635, p = .934$.

Discussion. Insight into whether certain industries have better resilience for performance at two days and four weeks is an important question. The high ranking on performance restoration for the finance/insurance industry may relate to its repetitive incidents and preparations. Health/education/social services' high rank may relate to its health orientation for staff. Why public administration and utilities appear to have less resilience is a critical question for those industries.

For perceived adequacy of organizational response, it is curious however that the finance/insurance industry, the most experienced with critical incidents, achieved the *lowest* industry percent for a highly adequate organizational response and the real estate industry with the fewest incidents achieved the *highest* percent. Whether characteristics

of the financial industry (such as its tendency for repetitive incidents) and real estate and rentals (such as its dispersed, small offices or public-facing exposure) associate with these results could be topics for future research.

Incident Type. The literature notes that specific incident types have unique characteristics that associate with varying incidences of stress disorder (Antai-Otong, 2001; Elklit, 2002; Flannery, 1996; Gluhoski & Wortman, 1996; B. L. Green et al., 1990; Lloyd & D'Antonio, 1992; Rothbaum et al., 1992; Toscano, 1995). Similarly, incident types may have important implications for organizational outcomes. Employee deaths and criminal acts dominated the types of incidents to which the unit responded. Incidents such as industrial and natural disasters and accidents occurred among the unit's client organizations less often. This section explores whether incident type affects organizational outcomes. Table 50: Organizational Outcomes by Incident Type reports the relationships.

Table 50: Organizational Outcomes by Incident Type

	Organizational Outcome	Incident Category: Accident N = 109	Criminal Act N = 1950	Death N = 2258	Disaster - Industrial and Natural N = 111	Other Employee Stressor N = 163	Illness N = 104	Organization Change N = 486
a.	Performance Restoration, Two Days	78.4%	83.5%	78.9%	61.2%	77.1%	77.5%	81.2%
		X^2 (6, 4097) = 34.399, p= .000						
b.	Performance Restoration, Four Weeks	95.7% Invalid Test	96.1%	97.4%	93.8%	94.4%	96.5%	92.4%
c.	Retention in Organization	98.6% Invalid Test	94.7%	98.4%	93.2%	95.8%	98.4%	91.6%
d.	Retention in Affected Workgroup	97.1% Invalid Test	96.1%	98.8%	91.8%	97.3%	100.0%	95.3%
e.	Sustained Attendance	84.1% Invalid Test	94.4%	95.0%	90.6%	95.9%	93.4%	96.4%
f.	Positive Service Perception: Employees	100.0% Invalid Test	97.9%	98.3%	95.5%	92.3%	100.0%	98.3%
g.	Positive Service Perception: Management	100.0% Invalid Test	97.2%	98.3%	97.3%	95.7%	100.0%	98.7%
h.	Highly Adequate Organizational Response	79.7%	62.1%	69.9%	59.6%	63.2%	80.8%	63.3%
		X^2 (6, 2857) = 28.544, p= .000						

Findings. Whether workgroups restored to previous performance by two days post-incident differed significantly by the type of incident affecting the workgroup, $\chi^2(6, 4097) = 34.399, p= .000$. Performance restored at two days most often for workgroups when the incident was a criminal act (84%) and least often for a disaster (61%). Whether the organization responded highly adequately to the workgroup's traumatic event differed significantly by the type of incident affecting the workgroup, $\chi^2(6, 2857) = 28.544, p=$

.000. The organizational response was perceived as highly adequate most often when the incident was an illness (81%) and again least often for a disaster (60%).

Discussion. The impact of incident type is significant for performance at two days and for perception of adequacy of organization response. It is curious that while criminal acts tend to be severe incidents, workgroups experiencing them restore performance at the highest percent. This may be due to the repetitive nature of criminal acts in the financial industry and its focused attention on employee training and support. Organizational change may result in a high percent of workgroups resuming prior levels of performance due to the tendency of organizations to address it with large-scale training and extensive workplace support. Further, such events are usually of low severity and while stressful, are typically not traumatic. Employee's deaths, accidents, illnesses and employee stressors account for lower percents of performance restoration. The massive devastation of disasters may account for their producing the least percent of performance restoration observed.

For perception of adequacy of organizational response, illnesses and accidents account for the largest percent of high perception of adequacy (in contrast to their accounting for lower percents of performance restoration at two days). This suggests an interesting distinction when considering organizational outcomes to workplace trauma – actual functional organizational adaptation vs. positive perception of organizational response. It is also interesting that criminal acts associate with the second to lowest perception of adequacy of organizational response. Perhaps this relates to the repetitive occurrence of robberies in the financial industry, or perhaps employees hold financial employers responsible for robbery prevention. Disasters associate with the lowest percent

of highly adequate response. This may relate to employer's limited ability to intervene with the large scale environmental damage typical of disasters. For example, on-site groups can potentially address emotional needs of employees who witnessed the murder of a colleague, but cannot directly address environmental destruction of a flood or wildfire.

Incident Sub-Type. The most prevalent incident subtypes with which the unit assisted were: natural death, accidental death, suicide (all subtypes of employee deaths) and robbery and threat of violence (subtypes of criminal acts). Unfortunately, the agency's practice of reducing major incident categories further into multiple subtypes produces too many categories with a small number of incidents. This violates χ^2 requirements. Therefore no conclusions regarding the influence of subtype (i.e. homicide as a subtype of death) on outcomes (i.e. performance restoration) are possible. The relationship between incident subtype and an independent variable of interest - incident severity score (a quasi-interval variable) allows for an ANOVA. This relationship is analyzed in the next section.

Incident Severity. This section analyzes the effect of incident severity as measured by the revised incident severity scale, first on other key independent variables and then on the outcome variables.

Inter-Relationship between Incident Severity and Prior Workgroup Trauma. Do workgroups with prior trauma tend to experience more serve incidents? Table 51: Severity Score: Association with Prior Workgroup Trauma present the *t*-test results, with *N, M* and *SD*, *t* values, levels of significance and *Cohen's d*.

Table 51: Severity Score: Association with Prior Workgroup Trauma

t-test

		N	*M*	*SD*	*t-test Results*	*Cohen's d*
Prior Workgroup Trauma	Prior Trauma	848	13.68	5.42	*t(1308 = 6.601, p = .000*	.251
	No Prior Trauma	3539	12.3	5.57		

Findings. Incident severity associates significantly with whether a workgroup had experienced a prior traumatic incident, *t(1308) = 6.601, p = .000, d = .251.*

Discussion. In this sample, the severity of a current incident tended to be higher when the workgroup had experienced a prior traumatic incident, *t(1308) = 6.601, p = .000, d = .251.* This moderate effect size indicates that 25% of the variance for occurrence of prior trauma associates with incident severity. This suggests that industries experiencing multiple incidents also tended to experience more severe incidents. This is consistent with the large prevalence of financial organizations (banks) experiencing repetitive criminal acts (robberies) in the database.

The next section analyzes the relationship between incident related characteristics (industry type, incident type and incident subtype) and incident severity

Inter-Relationship between Incident Characteristics and Incident Severity. Do certain industries experience more severe incidents? Are certain incident types or subtypes likely to be scored as more severe? These variables relationships call for an ANOVA.

Incident Severity and Industry. Table 52: Industry and Incident Severity Score presents the ANOVA result, with *N, M* and *SD* for industry type, *F* value, level of significance and *eta* squared.

Table 52: Industry and Incident Severity Score

	N	*M*	*SD*	$\acute{\eta}^2$
Finance and Insurance	2055	15.44	4.722	.235
Trade - Wholesale and Retail	985	11.34	5.414	
Real Estate, Rental and Leasing	67	11.33	4.998	
Utilities	177	10.97	5.578	
Public Administration	230	10.67	4.992	
Travel and Leisure	253	9.56	4.987	
Health, Education, Social Services	301	9.37	4.440	
Construction, Manufacturing and Mining	558	9.11	4.947	
Professional, Scientific and Technical	269	9.08	5.121	
Other Services	286	8.74	4.514	
Total	5181	12.22	5.640	

F(9, 5171) = 176.128, p = .000

Findings. The effect of incident severity is significant for industry type, *F(9, 5171) = 176.128, p = .000*. The finance/insurance industry experienced the most severe incidents, while the professional/scientific/technical industry experienced the least severe. Effect size: $\acute{\eta}^2$=*.235.*

Discussion. The moderate effect size indicates that industry type accounts for 24% of the variance in incident severity. The high mean score for the finance/insurance industry is likely due to the prevalence of robberies and their tendency to be severe in nature (see below).

Incident Severity and Incident Type. Table 53: Incident Type and Incident Severity Score presents the ANOVA result with *N, M* and *SD* for incident type, *F* value, level of significance and *eta* squared.

Table 53: Incident Type and Incident Severity Score

	N	*M*	*SD*	$\acute{\eta}^2$
Disaster - Industrial and Natural	111	17.59	5.825	.502
Criminal Act	1950	17.00	3.091	
Accident	109	13.89	4.709	
Other Employee Stressors	163	9.69	4.453	
Death	2258	9.05	4.426	
Illness	104	8.74	3.826	
Organization Change	486	7.77	4.158	
Total	5181	12.22	5.640	

F(6, 5174) = 869.395, p = .000

Findings. The effect of incident severity is significant for incident type, *F(6, 5174) = 869.395, p = .000*. Effect size: $\acute{\eta}^2$*=.502)*.

Discussion. As expected, disasters and criminal acts are the most severe incidents, while non-specific employee stress, illness and organizational change are the less severe. Effect size indicates that incident type accounts for 50% of the variance in severity score.

Incident Severity and Incident Subtype. Table 54: Incident Sub-Type and Incident Severity Score presents the ANOVA result with *N, M* and *SD* for incident subtype, *F* value, level of significance and *eta* squared.

Table 54: Incident Sub-Type and Incident Severity Score

		N	*M*	*SD*	$\acute{\eta}^2$
Death	Homicide	294	12.91	5.290	.578
	Accidental Death	619	10.60	4.334	
	Suicide	334	8.72	3.556	
	Natural Death	1011	7.09	3.208	
Criminal Act	Robbery	1780	17.10	2.962	
	Assault	55	16.65	4.498	
	Abuse/Neglect	3	16.33	1.528	
	Other Criminal Act	47	15.85	3.951	
	Threat of Violence	65	15.45	3.865	
Organizational Change	Site Closing or Relocation	77	8.75	3.442	
	Reduction in Force	333	7.90	4.122	
	Reorganization	23	6.57	4.430	
	Termination of Employees	53	6.04	4.678	
Other Employee Stressor	Job-related Stress	40	11.13	4.868	
	Multiple Stressors	21	10.90	4.323	
	Peer Impact	24	10.38	3.843	
	Conflict Resolution	44	9.30	3.441	
	Other Employee Incident	12	9.17	3.353	
	Individual Crisis	23	6.30	5.004	
Accident	Accident - Other	5	15.60	5.595	
	Accidental Injury	77	14.73	4.035	
	Accidental Fire	3	12.33	7.767	
	Motor Vehicle Accident	24	11.04	5.279	
Illness	Illness - Other	50	10.16	4.017	
	Terminal Illness	53	7.43	3.171	
Disaster	Other Industrial Disaster	3	21.33	4.509	
	Hurricane	43	20.49	4.558	
	Tornado	9	18.89	2.934	
	Explosion	19	16.58	6.619	
	Electrocution	8	16.38	2.560	
	Biochemical Accident	1	16.00	0.00	
	Flood	6	15.33	2.875	
	Industrial Fire	14	15.00	5.174	
	Natural Fire	5	13.00	6.745	
	Earthquake	3	3.00	3.464	
Total		5181	12.22	5.640	

F(34, 5146) = 207.161, p = .000

Findings. The effect of incident severity is significant for incident subtype, *F(34, 5146) = 207.161, p = .000*. Effect size: $\acute{\eta}^2$*=.578*.

Discussion. Effect size ($\acute{\eta}^2$*=.578)* indicates that incident subtype accounts for 58% of the variance in incident severity. As expected, homicide has the highest mean score for

deaths, but surprisingly, accidental death is more severe than a suicide. Is the loss of a colleague to an accident more severe than a self-inflicted death? Also expected, natural employee deaths have a lower mean score. As anticipated, criminal acts have relatively high scores with robberies scoring the highest and organizational changes and other employee stressors receiving low severity scores. “Other employee stressors” is a residual classification including all non-traumatic incidents that do not involve organizational issues or change. As opposed to widespread organizational issues (site closing, major change of job responsibilities department wide), these are events involving one or a few employees, such as employees suffering from severe job stress, workgroup conflicts, distress over a peer’s crisis, etc. As subtypes, these events produce moderate severity scores, with job-stress ranking the highest. Accidental injuries score high as well, while accidental fires and motor vehicle accidents score lower. Illnesses tend to generate low severity scores. Finally, natural and industrial disasters predictably produce the highest severity scores, especially hurricanes and tornadoes. Explosions, electrocutions and biochemical accidents also generate high scores, as would be expected for events that are consistently severe in nature. Floods and fires score high as well.

The next section explores relationships between incident severity and key independent service variables.

Inter-Relationship between Incident Severity and Service Variables. The following questions are explored. Does whether an organization initially accepts on-site services associate with higher severity scores? Do more severe incidents associate with implementation of on-site groups, counseling sessions or management consultations? How does incident severity influence whether an organization completes follow-up

services at two days or four weeks? To analyze the association of severity score with such dichotomous variables, a t-test was conducted. Table 55: Severity Score Impact on Service Variables, presents results.

Table 55: Severity Score Impact on Service Variables

t-tests

		N	*M*	*SD*	*t-test Results*	*Cohen's d*
Decision for On-Site Services	Accepted	4500	12.30	5.678	*t(926) = 2.576, p = .014*	.015
	Declined	681	11.72	5.363		
Groups Implemented	Groups	3048	12.84	5.626	*t(4629) = 9.560, p = .000*	.270
	No Groups	2133	11.33	5.544		
Individual Session	Sessions	2942	12.20	5.615	*t(4791) = - .292, p = .770*	
	No Sessions	2239	12.25	5.674		
Manager Consultations	Consultations	2980	12.06	5.675	*t(4779) = - 2.369, p = .018*	-.067
	No Consultations	2201	12.44	5.588		
On-Site Services	On-Site Services	4337	12.37	5.647	*t(1207) = 4.352, p = .000*	.162
	No On-Site Services	844	11.46	5.546		
Follow-Up Two Days	Completed	4434	12.53	5.605	*t(1025) = 9.934, p = .000*	.389
	Not Completed	747	10.37	5.495		
Follow-Up Four Weeks	Completed	3442	12.91	5.578	*t(3522) = 12.534, p = .000*	.369
	Not Completed	1739	10.86	5.517		

Findings. The effect of incident severity is significant for whether organizations initially accept the offer for on-site services, *t(926) = 2.576, p = .014, d = .015,* for whether organizations subsequently implement groups, *t(4629) = 9.560, p = .000, d = .270,* manager consultations, *t(4779) = - 2.369, p = .018, d = -.067* and whether organizations implemented at least one of the three on-site services, *t(1207) = 4.352, p = .000, d = .162.* Severity also associates significantly with whether organizations complete follow-up services at two days, *t(1025) = 9.934, p = .000, d = .389* and four weeks, *t(3522) = 12.534, p = .000, d = .369.*

Discussion. As anticipated, the more severe an incident, the more likely the organization was to accept on-site services, implement groups, implement at least one of the on-site services and complete follow-up at both two days and four weeks - as part of their response plan. Among these significant findings, moderate effect sizes are seen for follow-up at two days (39%), follow-up at four weeks (37%) and whether groups were implemented (27%). A possible reason for organizations completing follow-up services at both timeframes for more severe incidents is that more severe incidents generate more concern and a felt need to review workgroup progress and obtain further consultation and support. A negligible effect is observed for whether the organization initially accepted on-site services (2%). A small effect is seen for whether the organization later implemented at least one of the services (16%), indicating only some of the variance in this variable is related to incident severity. Curiously, the effect for management consultations is negligible and *negative*. This result was not anticipated. Slightly *less* severe incidents result in *more* organizations implementing on-site manager consultations. The effect size, however, is not meaningful. Also not anticipated is that severity score is not significant for on-site individual counseling sessions. A possible explanation is that as counselors conduct on-site groups, they identify individuals in extreme stress and offer counseling after the group ends. The random occurrence of *highly distressed employees* in groups may associate with provision of individual sessions more than incident severity. Said another way, individual differences, rather than incident differences, may account for whether individual sessions occur.

Incident Severity and Organizational Outcomes. Based on results from the revised six-item CrISIS Scale in chapter two, 728 workgroups (14%) experienced an event

scored 19 or higher. This section explores the effect of revised scores on the five ordinal outcome variables. Table 56: Mean Severity Scores and Organizational Outcomes, presents the ANOVA results for performance restoration, helpfulness of services for employees and management and adequacy of organizational response. The table presents *N, M, and SD*, *F* values, levels of significance and *eta* squared.

Table 56: Mean Severity Scores and Organizational Outcomes (ANOVAs)

		Incident Severity Score			
Performance Restoration Two Days	*N*	*M*	*SD*	*ANOVA Results*	η^2
Strongly Disagree	58	19.12	4.95	*F(5, 4091) = 22.015*	*.026*
Disagree	231	14.53	5.96	*p = .000*	
Somewhat Disagree	508	12.78	5.83		
Somewhat Agree	1613	12.53	5.50		
Agree	1542	12.44	5.34		
Strongly Agree	145	12.74	4.84		
Totals	4097	12.74	5.55		
Performance Restoration Four Weeks					
Strongly Disagree	12	19.67	7.44	*F(5, 3345) = 7.801*	*.012*
Disagree	30	15.13	6.11	*p = .000*	
Somewhat Disagree	78	15.26	5.97		
Somewhat Agree	514	12.93	5.91		
Agree	2122	12.77	5.45		
Strongly Agree	595	13.16	5.38		
Totals	3351	12.97	5.57		
Service Helpfulness for Employees					
Not helpful	31	14.42	5.53	*F(4, 3737) = 1.982,*	
Not Very Helpful	39	13.44	5.31	*p = .094*	
Somewhat Helpful	83	13.39	5.24		
Helpful	1869	12.82	5.74		
Very Helpful	1720	12.50	5.53		
Totals	3742	12.70	5.63		
Service Helpfulness for Management					
Not helpful	38	14.11	5.48	*F(4, 3723) = 1.447,*	
Not Very Helpful	38	13.32	5.07	*p = .216*	
Somewhat Helpful	83	13.40	5.33		
Helpful	1949	12.70	5.75		
Very Helpful	1620	12.50	5.55		
Totals	3728	12.65	5.65		
Adequacy of Organizational Response					
Poor Response	19	15.42	5.805	*F(4, 2852) = 3.617,*	.005
Satisfactory Response	948	13.54	5.631	*p = .006*	
Very Good Response	1498	12.96	5.527		
Excellent Response	392	12.62	5.869		
Totals	2857	13.12	5.621		

Findings. The effect of incident severity is significant for performance restoration two days post incident, $F(5, 4091) = 22.015, p = .000,$ performance four weeks post incident, $F(5, 3345) = 7.801, p = .000$ and for perceived adequacy of organizational response, $F(4, 2852) = 3.617, p = .006.$ Effect sizes, however, are consistently weak ($\acute{\eta}^2 = .026, .012, .005).$ ANOVA results shows that the effect of incident severity is not significant for helpfulness to employees, $F(4, 3737) = 1.982, p = .094$ or for helpfulness to management, $F(4, 3723) = 1.447, p = .216$.

Discussion. While results suggest an association for performance and organizational response, weak effect sizes for all three outcomes preclude any definitive interpretation. However, observed patterns do indicate the less severe the incident, the more likely performance is perceived as restored at both timeframes. Workgroups still not restoring (disagree, strongly disagree) at four weeks have higher mean severity scores than workgroups not restoring in the same categories at two days. This suggests that the more severe the incident, the longer the recovery period for performance.

Agency practitioners observe that in some instances there appears to be a positive relationship between incident severity and perception of organizational response while in others the association is negative. Severe incidents generate a high sense of urgency and emotionality and organizations tend to intervene very quickly, with comprehensive supportive services. In some practice observations the significant influx of resources and attention appears to associate with higher perception of the adequacy of the organization response. In others, more severe incidents seem to result in lower perceived organization responses. Results here favor the former: the *more* severe the incident the *less* likely the organization is perceived as responding adequately. Does the extensive or acute

disruption of more severe incidents overshadow the impact of quick intervention and comprehensive support? To explore these relationships further, five ordinal dependent variables for performance, service helpfulness and adequacy of organizational response are also analyzed as dichotomous variables, along with the three original dichotomous dependent variables for retention and attendance. Table 57: Mean Severity Score and Organizational Outcomes (t-tests), presents the t-test results, with *N, M* and *SD* for organizational outcomes, *t* values, levels of significance and *Cohen's d*.

Table 57: Mean Severity Score and Organizational Outcomes (t-tests)

		Incident Severity Score				
		N	*M*	*SD*	*t-test Results*	*Cohen's d*
Performance Restoration Two Days	No	797	13.75	6.04	*t(1122) = 5.346,*	*.218*
	Yes	3300	12.50	5.39	*p = .000*	
Performance Restoration Four Weeks	No	120	15.67	6.24	*t(126) = 4.839,*	*.476*
	Yes	3231	12.87	5.51	*p = .000*	
Retention Within the Organization	No	130	15.76	5.89	*t(138) = 5.413,*	*.499*
	Yes	3294	12.91	5.53	*p = .000*	
Retention within the Affected Workgroup	No	95	15.38	6.40	*t(98) = 3.660,*	*.407*
	Yes	3327	12.95	5.53	*p = .000*	
Sustained Attendance	No	186	14.24	6.41	*t(201) = 2.845,*	*.226*
	Yes	3192	12.88	5.51	*p = .005*	
Service Helpfulness to Employees	No	39	13.44	5.31	*t(39) = .713,*	
	Yes	1869	12.82	5.74	*p = .480*	
Service Helpfulness to Management	No	76	13.71	5.25	*t(78) = 1.799,*	
	Yes	3569	12.61	5.66	*p = .076*	
Adequacy of Organizational Response	Low/Moderate	967	13.57	5.63	*t(1935) = 3.076.*	*.121*
	High	1890	12.89	5.59	*p = .002*	

Findings. The effect of incident severity is significant on performance at two days, *t(1122) = 5.346, p = .000, d = .218;* performance at four weeks *t(126) = 4.839. p = .000, d = .476*; retention within the organization, *t(138) = 5.413, p = .000*, *d = .499*; retention within the affected workgroup, *t(98) = 3.660, p = .000, d = .407*; sustained attendance, *t(201) = 2.845, p = .005, d = .226*; and adequacy of organizational response, *t(1935) = 3.076, p = .002, d = .121*.

Discussion. Results indicate that for more severe incidents employees are more likely to underperform at the two time frames, leave the organization, transfer out of the affected workgroup and have extended leaves of absence. Results also indicate that the more severe is the incident, the less positively the organization's response is perceived. Among these significant findings, a large, and the strongest effect is seen for retention within the organization vs. resignations where 50% of the variance in retention is explained by incident severity. Moderate effect sizes are observed for performance at four weeks (48%) followed by retention within the affected workgroup (41%), attendance (23%) and performance at two days (22%). A small effect is seen for adequacy of organizational response (12%).

Whether employees experiencing more severe incidents have difficulty adjusting post-incident and/or are no longer as committed to the organization or workgroup is an important question that merits further consideration.

Service Delivery Phase Analysis

Initial Organizational Decision for Implementing On-Site Services. When faced with a potentially traumatic event, organizations contacting the unit are immediately provided telephonic consultation and supportive educational materials. A response strategy is then designed which normally includes deploying various resources already available within the organization supplemented by on-site services provided through a network of community trauma providers. However, during the three years under study, 681 organizations (13.1%) declined on-site services. This section explores whether this decision may influence organizational outcomes. Table 58: Organizational Outcomes by Initial Intention for On-Site Services presents cross tabulation percents for initial acceptance and declination of on-site services and each organizational outcome, χ^2 values, levels of significance and Kendall's tau.

Table 58: Organizational Outcomes by Initial Intention for On-Site Services

		Cross Tabulation %		X^2 Results	Kendall's tau
		Accepted N = 4500	Declined N = 618		
a.	Performance Restoration at Two Days Post Incident	79.6%	87.4%	$X^2(1,4097) = 17.704$, $p = .000$	tau c = .035, $p = .000$
b.	Performance Restoration at Four Weeks Post Incident	96.3%	97.5%	$X^2(1,3351) = 1.453$, $p = .228$	
c.	Employee Retention within the Organization	96.1%	97.1%	$X^2(1,3424) = .823$, $p = .364$	
d.	Employee Retention within Affected Workgroup	97.0%	98.9%	$X^2(1, 3422) = 4,502$, $p = .034$	tau c = .007, $p = .002$
e.	Affected Employees Sustain Attendance	94.7%	93.0%	$X^2(1,3378) = 1.728$, $p = .189$	
f.	Positive Perception of Service Helpfulness for Employees	97.9%	100.0%	Invalid Test	
g.	Positive Perception of Service Helpfulness for Management	98.0%	94.1%	Invalid Test	
h.	Perception of a Highly Adequate Organizational Response	68.0%	48.9%	$X^2(1,2857) = 40.844$, $p = .000$	tau c = .067, $p = .000$

Findings. Whether the affected organization initially accepted on-site services is significant for whether workgroups restored to previous performance by two days, $\chi^2(1, 4097) = 17.704, p = .000$ (performance restored: 87.4% for *declined*, 76.9% for accepted), whether the workgroups retained employees within the affected workgroup, $\chi^2 (1, 3422) = 4.502, p= .034$ (retained: 98.9% for *declined*, 97% for accepted), and whether an organization responded highly adequately to a workgroup's traumatic event, $\chi^2 (1, 2857) = 40.844, p= .000$ (highly adequate response: 68% for accepted, 48.9% for declined). Despite the significance of these relationships, Kendall's tau consistently indicates the strengths of association are extremely weak (*035, .007 and .067).* Whether

an organization initially accepted the offer to provide on-site services had no impact on workgroup performance at four weeks, χ^2 *(1, 3351) = 1.453, p = .228*, whether employees remained within the organization post-incident, χ^2 *(1, 3424) = .823, p = .364* or whether employees sustained attendance, χ^2 *(1, 3378) = 1.728, p = .189*.

Discussion. While no associations are meaningfully significant, counter to expectations, performance restoration at two days and retention within the affected workgroup are better when the organization *declined* on-site services. However, the limitation of a bivariate analysis is that it does not take into consideration that when organizations decline services, there may be factors present that mitigate the negative impact on performance and retention. For example, such situation may involve less severe incidents. If a workgroup truly does not need on-site services, such a workgroup whose organization declines services may restore performance and achieve retention better than a severely impacted workgroup, whose organization accepts them. Controlling for these influences may produce different findings

While acceptance of on-site services is not significant for performance restoration at four weeks or for retention within the organization, the percents for those outcomes are again better for organizations that declined on-site services. In contrast, the initial decision regarding on-site services associates positively with the perception of whether an organization responded highly adequately to a workgroup's traumatic event. Among organizations perceived as responding highly adequately, organizations accepting on-site services outnumber those who declined them by nearly 20%. This again suggests different ways to think about outcomes. While intention to provide on-site services might

associate with a positive perception of organizational response (image oriented) it may not associate with some functional adaptations (such as performance or retention).

Implementation of On-Site Groups. On-site groups are often part of an organization's incident response strategy. As reported in chapter two, 3048 organizations (59%) implemented groups. Table 59: Organizational Outcomes by Implementation of Groups presents cross tabulation percents for group implementation and each organizational outcome, χ^2 values, levels of significance and Kendall's tau.

Table 59: Organizational Outcomes by Implementation of Groups

		Cross Tabulation %		X^2 Results	Kendall's tau
		Groups Provided N = 3048	No Groups Provided N = 2133		
a.	Performance Restoration at Two Days Post Incident	79.3%	82.3%	$X^2(1,4097) = 5.730$, $p = .017$	tau c = .029, $p = .015$
b.	Performance Restoration at Four Weeks Post Incident	95.8%	97.4%	$X^2(1,3351) = 6.129$, $p = .013$	tau c = .015, $p = .009$
c.	Employee Retention within the Organization	95.9%	96.7%	$X^2(1,3434) = 1.388$, $p = .239$	
d.	Employee Retention within Affected Workgroup	96.8%	97.9%	$X^2(1, 3422) = 3,820$, $p = .051$	tau c = .011, $p = .040$
e.	Affected Employees Sustain Attendance	94.4%	94.7%	$X^2(1,3378) = .122$, $p = .727$	
f.	Positive Perception of Service Helpfulness for Employees	97.9%	98.1%	$X^2(1,1908) = .061$, $p = .806$	
g.	Positive Perception of Service Helpfulness for Management	97.7%	98.3%	$X^2(1,3645) = 1.411$, $p = .235$	
h.	Perception of a Highly Adequate Organizational Response	67.1%	64.6%	$X^2(1, 2857) = 1.964$, $p = .161$	

Findings. Whether workgroups restored to previous performance by two days post-incident differed significantly by whether an organization implemented on-site groups, $\chi^2(1,4097) = 5.730, p = .017$ (performance restored: 82% for no groups, 79% for groups). Whether workgroups restored to previous performance by four weeks also differed significantly by whether an organization implemented groups, $\chi^2(1, 3351) = 6.129, p = .013$ (performance restored: 97% for no groups, 96 % for groups). Whether workgroups retained employees within the affected workgroup differed significantly by whether an organization implemented groups, $\chi^2(1, 3422) = 3.820, p = .051$ (retained: 98% for no groups, 97% for groups). For all three associations, Kendall's tau c is very weak *(.015, .009 and .040).*

Whether workgroups retained employees within the organization did *not* differ significantly by whether an organization implements on-site group intervention $\chi^2(1, 3424) = 1.388, p = .239,$ whether workgroups sustained attendance, $\chi^2(1, 3378) = .122, p = .727,$ whether services were helpful for employees, $\chi^2(1, 1908) = .061, p = .806,$ whether services were helpful for management, $\chi^2(1, 3645) = 1.411, p = .235$ or perception of whether the organization responded highly adequately to the workgroup's traumatic event, $\chi^2(1, 2857) = 1.964, p= .161.$

Discussion. While no significant and strong associations are found, counter to expectation, for performance restored at two days and four weeks and for retention within the affected workgroup, percents are slightly higher for organizations *not* implementing groups. This observation, coupled with findings of non-significance between groups and all other outcomes are as puzzling as they are profound for program theory, which asserts the benefits of groups to organizational recovery. However, while empirically, findings

suggest no association with organizational outcomes, as noted above, conclusions drawn from a bivariate analysis not controlling for other variables must be tentative. Organizations that implement groups may have less severe incidents or may associate with other factors that mitigate negative impacts.

Implementation of On-Site Individual Counseling. During the researched period, 2942 organizations (57%) implemented on-site individual counseling sessions to further support specific employees in acute distress. Table 60: Organizational Outcomes by Implementation of Individual Sessions presents cross tabulation percents for session implementation and each organizational outcome, χ^2 values, levels of significance and Kendall's tau.

Table 60: Organizational Outcomes by Implementation of Individual Sessions

		Cross Tabulation %		X^2 Results	Kendall's tau
		Sessions Implemented N = 2942	No Sessions Implemented N = 2239		
a	Performance Restoration at Two Days	79.6%	81.8%	$X^2(1,4097) = 3.009$, $p = .078$	
b	Performance Restoration at Four Weeks	96.5%	96.3%	$X^2(1,3351) = .053$, $p = .817$	
c	Employee Retention within the Organization	96.0%	96.5%	$X^2(1,3434) = .457$, $p = .499$	
d	Employee Retention within Affected Workgroup	97.0%	97.5%	$X^2(1, 3422) = .819$, $p = .366$	
e	Affected Employees Sustain Attendance	94.1%	95.0%	$X^2(1,3378) = 1.251$, $p = .263$	
f	Positive Perception of Service Helpfulness for Employees	98.5%	97.0%	$X^2(1,1908) = 5.013$, $p = .025$	tau c = .014, $p = .040$
g	Positive Perception of Service Helpfulness for Management	98.4%	97.0%	$X^2(1,3645) = 8.664$, $p = .003$	tau c = .013 $p = .007$
h	Perception of a Highly Adequate Organizational Response	67.4%	64.4%	$X^2(1, 2857) = 2.655$, $p = .103$	

Findings. Whether an organization implemented on-site individual counseling sessions significantly associates with whether services were helpful for employees, $\chi^2(1, 1908) = 5.013, p = .025$ (helpful: 98.5% with sessions, 97% without) and whether services were helpful for management, $\chi^2(1, 3645) = 8.664, p = .003$ (helpful: 98.4% with sessions, 97% without). Despite the significance for both, Kendall's tau c indicates the strengths of association are weak *(.040, .007).* Whether an organization implements counseling sessions had no impact on whether workgroups restored to previous performance by two days post-incident, $\chi^2(1, 4097) = 3.099, p = .078,$ whether workgroups restored to previous performance by four weeks, $\chi^2(1, 3351) = .053, p =$

.817, whether there was retention within the organization*,* χ^2*(1, 3424) = .457, p = .499,* whether there was retention within the affected workgroup, χ^2*(1, 3422) = .819, p = .366* or whether workgroups sustained attendance, χ^2*(1, 3378) = 1.251, p = .263.* Whether the organization was perceived to a have responded highly adequately also did not differ significantly by whether an organization implements individual counseling, χ^2*(1, 2857) = 2.655, p = .103.*

Discussion. The lack of significance and significance combined with weak effect sizes suggest that individual counseling contributes very little or not at all to organizational outcomes.

Implementation of On-Site Management Consultations. As noted in the literature review, how managers respond to employees exposed to a critical incident is considered an important determinant for recovery of both the workgroup and the organization. Managing performance in the aftermath of an incident requires a delicate balance between ensuring continued operations and supporting employees who may have acute stress symptoms. Workplace trauma professionals, skilled in assisting managers with understanding post-incident stress and the process of recovery, aim to facilitate achieving this balance. In the study period, 2980 organizations (57%) received management consultation as part of the organizational response strategy. Table 61: Organizational Outcomes by Implementation of Management Consultations presents cross tabulation percents for consultation implementation and each organizational outcome, χ^2 values, levels of significance and Kendall's tau.

Table 61: Organizational Outcomes by Implementation of Management Consultations

		Cross Tabulation %		X^2 Results	Kendall's tau
		Consults Implemented N = 2980	No Consults Implemented N = 2201		
a	Performance Restoration at Two Days	79.6%	81.8%	$X^2(1,4097) = 3.084$, $p = .079$	
b	Performance Restoration at Four Weeks	96.4%	96.5%	$X^2(1,3351) = .023$, $p = .878$	
c	Employee Retention within the Organization	96.1%	96.4%	$X^2(1,3434) = .283$, $p = .595$	
d	Employee Retention within Affected Workgroup	97.0%	97.6%	$X^2(1, 3422) = 1,186$, $p = .276$	
e	Affected Employees Sustain Attendance	93.9%	95.3%	$X^2(1,3378) = 2.285$, $p = .093$	
f	Positive Perception of Service Helpfulness for Employees	98.2%	97.5%	$X^2(1,1908) = 1.363$, $p = .243$	
g	Positive Perception of Service Helpfulness for Management	98.3%	97.3%	$X^2(1, 3645) = 4.336$, $p = .037$	$tau\ c = -.009$, $p = .050$
h	Perception of a Highly Adequate Organizational Response	67.3%	64.6%	$X^2(1, 2857) = 2.201$, $p = .138$	

Findings. Whether an organization implements management consultation had no impact on whether workgroups restored to previous performance by two days post-incident, $\chi^2(1, 4097) = 3.084, p = .079,$ whether workgroups restored to previous performance by four weeks, $\chi^2(1, 3351) = .023, p = .878$, whether employees were retained within the organization, $\chi^2(1, 3424) = .283, p = .595$, whether employees were retained within the affected workgroup, $\chi^2(1, 3422) = 1.186, p = .276$ or whether employees sustained attendance, $\chi^2(1, 3378) = 2.825, p = .093.$ Consultations were also

not significant for whether services were helpful for employees, $\chi^2(1, 1908) = 1.363, p = .243$ or for whether the organization was perceived as responding adequately to the workgroup's traumatic event, $\chi^2(1, 2857) = 2.201, p = .138.$ Perception of whether services were helpful for management did differ significantly by whether an organization implemented management consultation, $\chi^2(1, 3645) = 4.336, p = .037$ (helpful: 98.3% with consultations, 97.3% without). However, despite the significance, Kendall's tau c is very weak *(.050).*

Discussion. While logic suggests that management consultations contribute to a perception of services as helpful *to* management, the negligible effect size precludes confirming an association. While many practitioners assume management consultations assist organizations in recovering their functionality in the aftermath of an incident, findings here do not support such an assumption.

Implementation of At Least One On-Site Service. All organizations in the database utilized telephonic support, educational materials and employee referral to individual services. Following the incidents, 4337 organizations (83.7%) also utilized at least one of the on-site services (groups, individual sessions or management consultations) while 844 organizations (16.3%) elected to utilize only the initial telephonic services. Table 62: Organizational Outcomes by Implementation of Any On-Site Service presents cross tabulation percents for on-site service and each organizational outcome, χ^2 values, levels of significance and Kendall's tau.

Table 62: Organizational Outcomes by Implementation of Any On-site Service

		Cross Tabulation %		X^2 Results	Kendall's tau
		On-Site Service N = 4337	No On-Site Service N = 844		
a	Performance Restoration at Two Days	83.1%	80.1%	$X^2 (1,4097) = 3.238, p = .072$	
b	Performance Restoration at Four Weeks	97.8%	96.2%	$X^2 (1,3351) = 2.940, p = .086$	
c	Employee Retention within the Organization	97.2%	96.0%	$X^2 (1,3434) = 1.528, p = .216$	
d	Employee Retention within Affected Workgroup	98.4%	97.0%	$X^2 (1, 3422) = 2.931, p = .087$	
e	Affected Employees Sustain Attendance	94.0%	94.6%	$X^2 (1,3378) = .301, p = .583$	
f	Positive Perception of Service Helpfulness for Employees	98.6%	97.9%	$X^2 (1,1908) = .322, p = .571$	
g	Positive Perception of Service Helpfulness for Management	98.5%	97.9%	$X^2 (1, 3645) = .442, p = .506$	
h	Perception of a Highly Adequate Organizational Response	59.5%	67.2%	$X^2 (1, 2857) = 8.964, p = .003$	tau c = .036, p = .004

Findings. Whether an organization implements at least one of the on-site services had no impact on performance restoration at two days, $\chi^2(1,4097) = 3.238, p = .072,$) or whether workgroups restored performance by four weeks, $\chi^2(1, 3351) = 2.940, p = .086.$ Nor was any association found for whether employees remained within the organization, $\chi^2(1, 3424) = 1.528, p = .216$), remained within the affected workgroup, $\chi^2(1, 3422) = 2.931, p = .087$ or whether workgroups sustained attendance, $\chi^2(1\ 3378) = .301, p = .583.$ Further, on-site service is not significant for whether services were helpful for employees, $\chi^2(1, 1908) = .322, p = .571$ or for management, $\chi^2(1,3645) = .442, p = .506.$

The only relationship found is between on-site service and perception of whether the organization responded highly adequately to the workgroup's traumatic event, $\chi^2(1, 2857) = 8.964, p = .003$. For 67.2% of workgroups, the organizational response was perceived as highly adequate when the organization implemented at least one of the on-site services, compared to 59.5% when it did not. Despite the significance, Kendall's tau c indicates the strength of association is negligible *(.004).*

Discussion. The finding that implementation of at least one of the on-site services contributes not at all to most organizational outcomes and negligibly one is surprising and counters the thinking that the presence of counselors on-site post incident is important to organizational recovery.

Implementation of Follow-Up Two Days Post Services. Follow-up service seeks to indentify how the workgroup and organization are adjusting to the event over time and determine if further services are indicated. Of the 5181 organizations agreeing to follow-up services, the clear majority (4434, 85.6%) completed follow-up at two days post services. Table 63: Organizational Outcomes by Completion of Follow-Up Services at Two days presents cross tabulation percents for follow-up and each organizational outcome, χ^2 values and levels of significance.

Table 63: Organizational Outcomes by Completion of Follow-Up Services Two Days

		Cross Tabulation %		X^2 Results
		Folow-Up Completed N = 4434	Folow-Up Not Completed N = 747	
a	Performance Restoration at Two Days	80.5%	89.5%	Invalid Test
b	Performance Restoration at Four Weeks	96.4%	97.1%	$X^2 (1,3351) = .351, p = .554$
c	Employee Retention within the Organization	96.1%	97.5%	$X^2 (1,3434) = 1.429, p = .232$
d	Employee Retention within Affected Workgroup	97.1%	98.2%	$X^2 (1, 3422) = 1.127, p = .288$
e	Affected Employees Sustain Attendance	94.4%	95.7%	$X^2 (1,3378) = .824, p = .364$
f	Positive Perception of Service Helpfulness for Employees	98.0%	93.8%	Invalid Test
g	Positive Perception of Service Helpfulness for Management	97.9%	96.8%	Invalid Test
h	Perception of a Highly Adequate Organizational Response	66.2%	65.6%	$X^2 (1, 2857) = .029, p = .864$

Findings. Whether an organization receives follow-up services at two days post-incident had no impact on whether workgroups restored to previous performance by four weeks, $\chi^2(1, 3351) = .351, p = .554$, whether employees remained within the organization, $\chi^2(1, 3424) = 1.429, p = .232,$ remained within the affected workgroup, $\chi^2(1\ 3422) = 1.127, p = .288$ or whether workgroups sustained attendance, $\chi^2(1, 3378) = .824, p = .364.$ Further, perception of whether the organization responded adequately to the workgroup's traumatic event did not differ significantly by whether an

organization receives follow-up services at two days post-incident, $\chi^2(1, 2857) = .029, p = .864$.

Discussion. While follow-up enables collection of organizational outcome data, the processes and activities of follow-up itself is not shown to associate with any outcomes.

Implementation of Follow-Up Four Weeks Post Services. Fewer organizations completed follow-up at four weeks (3442, 66%) than at two days (86%). Table 64: Organizational Outcomes by Completion of Follow-Up Services at Four Weeks presents cross tabulation percents for on-site service and each organizational outcome, χ^2 values, levels of significance and Kendall's tau.

Table 64: Organizational Outcomes by Completion of Follow-Up Services Four Weeks

		Cross Tabulation %		X^2 Results	Kendall's tau
		Folow-Up Completed N = 3442	Folow-Up Not Completed N = 1739		
a	Performance Restoration at Two Days	79.9%	82.3%	$X^2 (1,4097) = 3.072, p = .086$	
b	Performance Restoration at Four Weeks	96.4%	93.8%	Invalid Test	
c	Employee Retention within the Organization	96.4%	98.6%	Invalid Test	
d	Employee Retention within Affected Workgroup	97.4%	88.5%	Invalid Test	
e	Affected Employees Sustain Attendance	94.6%	76.5%	Invalid Test	
f	Positive Perception of Service Helpfulness for Employees	98.1%	97.7%	$X^2 (1, 1908) = .288, p = .591$	
g	Positive Perception of Service Helpfulness for Management	98.2%	97.1%	$X^2 (1, 3645) = 4.520, p = .034$	$tau\ c = .009, p = .058$
h	Perception of a Highly Adequate Organizational Response	66.1%	80.0%	Invalid Test	

Findings. Whether an organization receives follow-up services at four weeks post-incident does not associate with whether workgroups had restored performance at two days, $\chi^2(1, 4097) = 3.072, p = .086$ or whether services were seen as helpful for employees, $\chi^2(1,1908) = .288, p = .591.$ Follow-up at four weeks does associate with whether services were seen as helpful for management, $\chi^2(1,3645) = 4.520, p = .034,$ but the percent difference is minimal (helpful: 98.2% with follow-up, 97.1% without) and Kendall's tau indicates the strength of association is weak *(.058).*

Discussion. Consistent with findings for follow-up at two days and outcomes, there are no strong and significant associations with outcomes observed with follow-up at four weeks. This suggests that while serving important functions - to assess for continued needs, offer additional services and obtain outcome data - the completion of follow-up calls to affected organizations does not itself contribute to organizational outcomes. A question emerges from this observation. To what degree do follow-up calls focus on data collection versus further assessment and support?

Bivariate Analysis: Summary of Overall Findings

For several outcomes, valid tests of association with independent variables could not be obtained. For performance at four weeks, retention within the organization, retention within the affected workgroup and sustained attendance, invalid χ^2 tests precluded analysis for associations with incident type and follow-up at four weeks. The associations of service helpfulness for both employees and management with effects from industry type, incident type, intention to implement on-site services and follow-up at two days are also not analyzed. An invalid χ^2 test result also occurred for the association of adequacy of organizational response with follow-up at four weeks. Given that clinical data mining relies on data designed to support practice rather than research and is often vulnerable to missing information and violations of statistical requirements, this complication is not unexpected.

For those tests of relationships between independent variables and outcomes that *are* valid, many are either not significant or significant with small effect sizes, rendering

them non-meaningful, a result also expected given the large sample size (5181 incidents). Independent variables with small affects on outcomes include prior workgroup trauma, incident subtype, whether organizations intended to implement on-site services and whether they subsequently implemented specific services.

Beyond the above limitations, there are some significant and meaningful findings. Incident severity associates significantly and with moderate to large effect sizes for several outcome variables. A large effect is seen for severity and retention within the organization and moderate effect sizes are observed for severity and performance at four weeks, performance at two days, retention within the affected workgroup and sustained attendance. Two outcomes, performance restoration at two days and perception of whether the organization responded highly adequately to the workgroup's traumatic event differed significantly by both industry type and incident type.

For the association of severity scores with other *independent* variables, several significant findings with at least moderate effect sizes are observed. Severity scores differed meaningfully by whether a workgroup experienced prior trauma, industry type, incident type, incident subtype, whether groups were implemented and whether follow-up occurred at two days and four weeks.

While results initially suggest which variables might contribute to a model that predicts for the outcomes, such zero order correlations do not control for intervening variables. Therefore, these conclusions were considered tentative, pending the results of a multivariate analysis controlling for interaction between variables and their combined affect on outcomes. The next chapter reviews results of logistic regression for selected outcomes.

Chapter Five

Multivariate Analysis

Traumatic Workplace Incident Characteristics, Services and Outcomes

Chapter two thoroughly explored descriptively all valid and reliable variables available within the CISM database. Chapter three reported a series of bivariate chi-square, t-test and ANOVA analyses, conducted to see if each organizational outcome differed by a pre-incident variable (prior workgroup trauma), incident characteristics (industry setting, incident type and incident severity) and service-related factors (groups, individual sessions and management consultations). Eight organizational outcomes explored included whether performance restores at two days and four weeks, whether employees are retained within the organization and within the affected workgroup, whether consistent attendance is sustained, whether services are helpful to employees or management and finally, whether the organization is perceived as responding highly adequately to events. Variables independently predicting organizational outcomes were noted.

This chapter now analyzes at the multivariate level those independent variables significantly associated with two selected organizational outcomes. The two selected outcomes are performance restoration at two days and perception of the adequacy of organizational outcome. Limiting the multivariate analysis to these two outcomes offers several advantages. First, these outcomes are poorly correlated on the bivariate level. Second, bivariate findings showed five diverse, independent variables that significantly associate with each outcome, four of which are the same. Alternatively, the number of

variables significantly associated with the remaining outcome variables is much more limited (one or two for most). Therefore, selection of performance at two days and adequacy of organizational response allows for a richer multivariate analysis. Third, these outcomes represent different lenses on organizational resilience. Employee performance post-incident represents an instrumental, functional aspect of organizational recovery, while perceived adequacy of organizational response relates more to the image an organization generates regarding its handling of an incident. Finally, running both analyses allows for a comparison of predictors. Exploration of the remaining outcomes will be subjects of future research and/or publications.

Given this study's purpose to explore the predictive ability of combinations of independent variables for organizational outcomes measured by dichotomous dependent variables, binary logistic regression, which will specify the probability that certain independent variables jointly influence outcomes, is the preferred statistical test. First, data screening results follow.

Data Screening

Outliers. Outliers were defined as incidents with a severity score plus or minus two standard deviations from the mean. Since logistic regression models can be sensitive to outliers for continuous independent variables, resulting in incorrect prediction of outcomes, this section analyses them. Table 65: Outlier Severity Score Distribution shows the incidence of outlier scores.

Table 65: Outlier Severity Score Distribution N = 119; M = 12.2; SD - 5.64; Range = 27;		
Score	Number of Incidents	Percent
1	76	63.9%
24	25	21.0%
25	10	8.4%
26	6	5.0%
27	2	1.7%
Total	119	100%

Table 66: Severity Score - Outliers, presents the frequency of outliers relative to two standard deviations from the mean.

Table 66: Severity Score - Outliers		
Distance from Mean	Number of Incidents	Percent
> 2 SD Above	43	1%
Within 2 SD	5062	98%
> 2 - SD Below	76	1%
Total	5181	100%
Outliers +/- 2 SD	119	2%

Outlier Descriptive Analysis. As expected, most high severity score outlier incidents are either a criminal act (assault, robbery, and homicide) or a disaster (natural or industrial). Since bank robberies are a frequent incident type in the database, also anticipated is that high score outliers tend to occur in the financial industry. Outliers also tend to involve a prior workgroup trauma (76%) and predominantly result in implementation of on-site services (93%).

In contrast, low severity score outlier incidents are distributed among several different industries (construction, financial, health care and wholesale and retail trade).

Common low outlier incident types are organizational change and natural death, which resulted in implementation of on-site services less often (63%) than for high scores, while low outliers involve prior trauma more frequently (96%).

Since preliminary regressions for both outcomes including outliers showed extremely large – 2 Log Likelihood (-2LL) measures, indicating a questionable model fit, regressions were re-run excluding outliers. However, there was no meaningful difference between model fits, variables included or excluded in the equation or significance levels for independent variables. This was the result for both performance restoration and adequacy of organizational response. Therefore, the decision was made to report regression results including all outliers.

Of interest is whether a predictive model of independent variables correctly classifies workgroups by performance restoration and adequacy of organizational response.

Performance Restoration Two Days Post Incident

The restoration of workgroup performance post incident is central to organizational resilience. In the database, performance restored at two days for 3,300 workgroups (81%, N = 4097) and did not restore for 797 workgroups (19%).

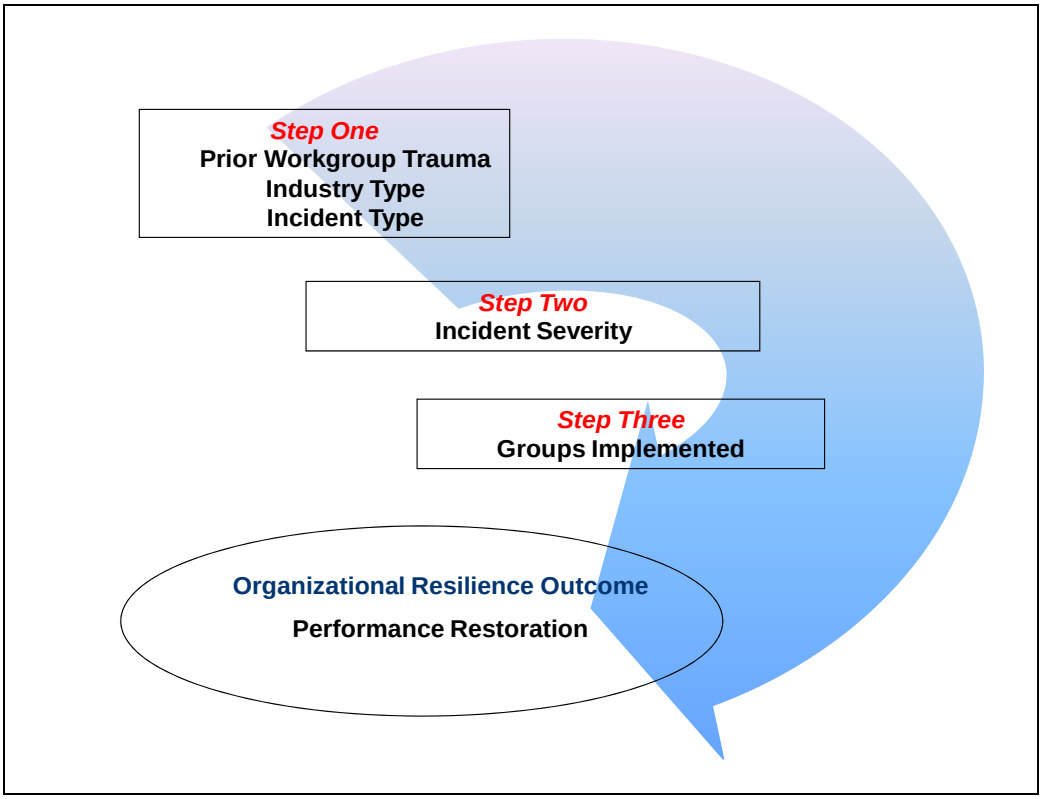
Missing Data

Of the 5181 incidents in the database, the regression analyzed 3967 incidents. While incidents with missing data numbered 1214, the incident to variable ratio requirement for a logistic regression is still easily satisfied.

Variables Entered in the Equation

Variables significantly associated with performance restoration in the bivariate analysis *($p < .05$),* were entered into the model, including whether prior workgroup trauma occurred, $X^2(1,3967) = 11.613, p = .001;$ industry type, $X^2(9, 4097) = 48.128, p = .000$, incident type, $X^2(6, 4097) = 34.399, p= .000,$ aggregate incident severity score, $t(1220) = 5.346, p = .000$ and whether on-site groups were implemented, $X^2(1,4097) = 5.730, p = .017$. Figure 7 illustrates the research proposition for projected multivariate influences on performance restoration. (While interactive influences among various independent variables and their indirect influences on dependent variables are assumed, for efficiency, the model is presented in a straightforward manner).

Figure 7: Multivariate Research Proposition for Performance Restoration



Collinearity

An initial linear regression was run to assess for possible collinearity between independent variables. Table 67: Collinearity Statistics – Performance Restoration at Two Days, presents the tolerance and variance inflation factors for each independent variable included.

Table 67: Collinearity Statistics - Performance Restoration at Two Days

Model	Tolerance	VIF
Prior Workgroup Trauma	.986	1.014
Industry Type	.946	1.057
Incident Type	.856	1.168
Aggregate Severity Score	.823	1.216
Provision of On-Site Group Sessions	.983	1.017

Dependent Variable: Performance Restoration At Two Days

Tolerance values among the predictor variables are all higher than .1 and all variance inflation factors (VIF) are less than 10.0, indicating the absence of collinearity, a measure of linear association among predictors.

Hierarchical Logistic Regression

To test the proposition that variables significant at the bivariate level also predict for performance restoration at two days at the multivariate level, I entered variables by steps into a hierarchical logistic regression. The first step included prior workgroup trauma, industry type and incident type. These serve as initial descriptors for any incident – the type of incident, the setting where it occurred and whether the workgroup had experienced a prior incident. Due to the bivariate finding of the central significance of incident severity, it is entered alone in the second step to assess its impact on other relationships thought to be significant. Finally, a significant service-related variable, whether the organization implemented on-site groups is entered in the third step.

Model Fit

Statistics utilized to test the ability of variables in the model to predict accurately performance restoration are the Omnibus Tests of Model Coefficients, the Hosmer-Lemeshow Test, the – 2LL and a Classification Table. Table 68: Full Model Goodness of Fit Tests – Performance Restoration at Two Days details the results of the first three.

Table 68: Full Model Goodness of Fit Tests
Performance Restoration at Two Days

	X^2	*df*	*p*
Omnibus Tests of Model Coefficients	170.997	18	.000
Hosmer-Lemeshow Test	8.288	8	.406
-2LL = 3744.811			

The Omnibus Tests of Model Coefficients show the model is statistically reliable in predicting performance restored vs. performance not restored at two days, $X^2 (18) = 170.997, p = .000$. The Hosmer-Lemeshow test indicates non-significance $X^2 (8) = 8.288, p = .406$, also indicating a well-fitting model (failure to reject the null hypothesis that there is no difference between observed and model-predicted outcomes). However, the – 2LL (3744.811) is extremely high, indicating a questionable model fit.

Another measure of model fit is the Classification Table, which compares the model's prediction for performance restoration with observed performance restoration and reports it as percentage correct. Table 69: Full Model Classification Table for Performance Restoration at Two Days displays the results.

Table 69: Full Model Classification Table for Performance Restoration at Two Days

Observed		Predicted		
		Performance at Two Days		
		Not Restored	Restored	Percentage Correct
Performance at Two Days	Not Restored	16	758	2.1%
	Restored	18	3175	99.4%
	Overall Percentage			80.4%

Cut Value = .500

Overall, the model correctly classified the performance outcomes of 80.4% of workgroups. While the accuracy of correctly predicting the observed performance restoration is nearly perfect at 99.4%, the model was extremely inaccurate in predicting performance *not* restored (2.1%).

Regression Coefficients: Variables in the Equation (Step One)

Table 70: Regression Coefficients - Variables in the Equation for Performance Restoration (Step One), presents the regression coefficients (weights), Wald statistics (with degrees of freedom and levels of significance) and Exp(B) - the odds ratios, for step one - entering prior workgroup trauma, industry type and incident type.

Table 70: Regression Coefficients - Variables in the Equation for Performance Restoration at Two Days (Step One)

	B	*Wald*	*df*	*Sig.*	*Exp(B)*
Prior Workgroup Trauma	-.398	16.055	1	.000	.671
Industry Type[1, 2]		24.650	9	.003	
Construction, Manufacturing and Mining (1)	.664	8.940	1	.003	1.943
Finance and Insurance (2)	.852	16.207	1	.000	2.344
Health, Education and Social Services (3)	.808	9.950	1	.002	2.243
Other Services (4)	.827	10.177	1	.001	2.286
Professional, Scientific and Technical (5)	.650	6.014	1	.014	1.916
Public Administration (6)	.278	1.192	1	.275	1.320
Real Estate and Rental and Leasing (7)	.850	4.308	1	.038	2.339
Trade - Wholesale and Retail (8)	.552	7.256	1	.007	1.737
Travel and Liesure (9)	.761	7.681	1	.006	2.140
Incident Type[1, 3]		14.597	6	.024	
Accident (1)	.829	5.679	1	.017	2.291
Criminal Act (2)	.946	14.093	1	.000	2.576
Death (3)	.773	10.533	1	.001	2.166
Employee Stressor (4)	.767	5.552	1	.018	2.153
Illness (5)	.629	2.932	1	.087	1.877
Organizational Change (6)	.805	8.346	1	.004	2.236
Constant	-.017	.004	1	.952	.983

1. Reference category selected as the category least likely to result in restored performance.
2. Industry Reference Category: Utilities
3. Incident Reference Category: Disaster

Findings. Wald statistics for step one indicate that nearly all but two predictors contribute significantly to performance restoration. For these significant predictors, the Odds Ratio (OR), the effect size or magnitude of the predictors are as follows. Workgroups who had experienced prior trauma were 49% less likely to restore to previous performance, compared to groups without prior trauma. For industry type, due to the bivariate finding that a utility is the industry setting where performance restoration is least likely, utility is selected as the industry reference category. In comparison to utilities, performance is more likely to restore within the majority of industry types. Performance is more than two times more likely to restore in several industry settings. These industries include finance and insurance (OR = 2.34), health, education and social

services (OR = 2.24), real estate rental and leasing (OR = 2.33) and travel and leisure (OR = 2.14). Performance is likely to restore in other industries as follows: construction, manufacturing and mining (94% more likely), professional, scientific and technical (91% more likely) and wholesale and retail trades (74% more likely). In comparison to utilities, public administration workgroups were not significantly more or less likely to restore performance.

For incident type, due to the bivariate finding that performance restoration is least likely to occur following a disaster, disaster is selected as the incident reference category. In comparison to disaster, performance is more likely to restore following the occurrence of a majority of incident types. Performance is more than two times more likely to restore following several incidents. These include accidents (OR = 2.29), criminal acts (OR = 2.57), employee deaths (OR = 2.16), other employee stressors (OR = 2.15) and organizational change (OR = 2.23). In comparison to a disaster, workgroups were not significantly more or less likely to restore performance following an illness.

Regression Coefficients: Variables in the Equation (Step Two)

Table 71: Regression Coefficients - Variables in the Equation for Performance Restoration at Two Days (Step Two), presents the regression coefficients (weights), Wald statistics and the odds ratios for step two - the addition of aggregate severity score.

Table 71: Regression Coefficients - Variables in the Equation for Performance Restoration at Two Days (Step Two)

	B	*Wald*	*df*	*Sig.*	*Exp(B)*
Prior Workgroup Trauma	-.390	14.981	1	.000	.677
Industry Type[1, 2]		27.167	9	.001	
Construction, Manufacturing and Mining (1)	.630	7.743	1	.005	1.878
Finance and Insurance (2)	.950	19.348	1	.000	2.586
Health, Education and Social Services (3)	.805	9.554	1	.002	2.237
Other Services (4)	.786	8.871	1	.003	2.194
Professional, Scientific and Technical (5)	.659	5.950	1	.015	1.934
Public Administration (6)	.312	1.445	1	.229	1.366
Real Estate and Rental and Leasing (7)	.967	5.377	1	.020	2.630
Trade - Wholesale and Retail (8)	.576	7.600	1	.006	1.779
Travel and Liesure (9)	.727	6.786	1	.009	2.069
Incident Type[1, 3]		48.273	6	.000	
Accident (1)	.512	2.060	1	.151	1.669
Criminal Act (2)	.796	9.472	1	.002	2.217
Death (3)	-.094	.132	1	.717	.910
Employee Stressor (4)	-.037	.011	1	.915	.964
Illness (5)	-.318	.674	1	.412	.728
Organizational Change (6)	-.183	.369	1	.543	.833
Aggregate Incident Severity Score	-.103	95.900	1	.000	.902
Constant	1.848	28.958	1	.000	6.348

1. Reference category selected as the category least likely to result in restored performance.
2. Industry Reference Category: Utilities
3. Incident Reference Category: Disaster

Findings. Wald statistics for step two indicate that when controlling for the severity of an incident, prior workgroup trauma and the same industry settings continue to predict significantly for performance with similar effect size. Workgroups who had experienced prior trauma were 48% less likely to restore to previous performance than workgroups with no prior trauma and, again in comparison to utilities, performance is more than two times more likely to restore in the same industry settings - finance and insurance (OR = 2.58), health, education and social services (OR = 2.23), real estate rental and leasing (OR = 2.63) and travel and leisure (OR = 2.06). Performance remains likely to restore in other industries as follows: construction, manufacturing and mining

(88% more likely), professional, scientific and technical (93% more likely) and wholesale and retail trades (78% more likely). In comparison to utilities, public administration workgroups remain not significantly more or less likely to restore performance.

However, controlling for severity dramatically alters which *incident* types predict for performance. Four incident types, accidents, employee deaths, other employee stressors and organizational change, which appeared to contribute significantly to performance restoration in step one, no longer significantly predict for restoration. This suggests that their contribution to restoration is due more to the severity of the incident, rather then the specific type of incident. The exception is criminal acts, which remain a significant predictor for restoration. Despite controlling for severity, in comparison to disasters, following a criminal act workgroups are still more than two times more likely to restore performance (OR = 2.21).

In addition to its important impact on the overall predictive model, the severity of an incident is also itself a predictor for performance, albeit only to a mild degree. As incident severity increases, workgroups are 10% *less* likely to restore their performance.

Regression Coefficients: Variables in the Equation (Step Three)

Table 72: Regression Coefficients - Variables in the Equation for Performance Restoration at Two Days (Step Three), presents the regression coefficients (weights), Wald statistics and the odds ratios for step three - the addition of whether organizations implemented on-site groups.

Table 72: Regression Coefficients - Variables in the Equation for Performance Restoration at Two Days (Step Three)

	B	*Wald*	*df*	*Sig.*	*Exp(B)*
Prior Workgroup Trauma	-.385	14.613	1	.000	.680
Industry Type[1, 2]		27.000	9	.001	
Construction, Manufacturing and Mining (1)	.629	7.707	1	.006	1.876
Finance and Insurance (2)	.943	19.040	1	.000	2.568
Health, Education and Social Services (3)	.804	9.524	1	.002	2.234
Other Services (4)	.783	8.803	1	.003	2.188
Professional, Scientific and Technical (5)	.643	5.650	1	.017	1.903
Public Administration (6)	.315	1.470	1	.225	1.370
Real Estate and Rental and Leasing (7)	.950	5.188	1	.023	2.585
Trade - Wholesale and Retail (8)	.560	7.163	1	.007	1.751
Travel and Liesure (9)	.720	6.648	1	.010	2.054
Incident Type[1, 3]		48.340	6	.000	
Accident (1)	.507	2.017	1	.156	1.660
Criminal Act (2)	.807	9.696	1	.002	2.240
Death (3)	-.081	.097	1	.755	.922
Employee Stressor (4)	-.027	.006	1	.938	.974
Illness (5)	-.314	.658	1	.417	.730
Organizational Change (6)	-.200	.439	1	.507	.819
Aggregate Incident Severity Score	-.102	92.932	1	.000	.903
Groups Implemented	.148	2.939	1	.086	1.159
Constant	1.772	26.125	1	.000	5.882

1. Reference category selected as the category least likely to result in restored performance.
2. Industry Reference Category: Utilities
3. Incident Reference Category: Disaster

Findings. For the full model, including the addition of whether groups are implemented, Wald statistics identified that step two predictors and non-predictors remain the same; suggesting incident severity continues to have the largest impact on the predictive model. Within the context of the full model, workgroups experiencing a prior trauma were 47% *less* likely to restore performance, compared to groups without prior trauma. As in step two, in comparison to utilities, performance continues to be more than two times more likely to restore in the following industry settings - finance and insurance (OR = 2.56), health, education and social services (OR = 2.23), real estate rental and leasing (OR = 2.58) and travel and leisure (OR = 2.05). Performance remains likely to

restore in other industries as follows: construction, manufacturing and mining (87% more likely), professional, scientific and technical (90% more likely) and wholesale and retail trades (75% more likely). In comparison to utilities, public administration workgroups are still not significantly more or less likely to restore performance.

The addition of groups to the model did not alter which incidents significantly predict for restoration in step two. The only incident type continuing to predict for restoration is criminal act. In comparison to disasters, workgroups are still more than two times more likely to restore performance following a criminal act (OR = 2.24). Aggregate incident severity continues to predict significantly for performance. As incident severity increases, workgroups remain 10% *less* likely to restore their performance. Whether workgroups participated in on-site groups does not itself significantly predict whether workgroups are more or less likely to restore performance.

Discussion. As noted in the literature cited in chapter one, given the central importance of employee performance to all organizations, several authors cite various types of compromised performance post trauma such as reduced productivity and neglecting job responsibilities (Burke, 1999; Farrell & Cubit, 2005; McCullough, 2005; Schouten et al., 2004) and diminished intrinsic work motivation (Janssen et al., 1999). This exploratory analysis sought to identify variables that may predict for whether performance impairment persists at two days post incident. In the full model, prior workgroup trauma, most industry types, incident severity score and the single incident type of criminal act exert a moderate influence on performance.

Industry types of finance/insurance, health/education/social services and rental/leasing exert the strongest influence. Due to the high frequency of robberies in

banks, they devote comprehensive resources to resilience training and providing state-of-the art, post incident support. The finding that this industry better restores performance suggests its strategy is effective. The finding that health/education/social service settings also better restore performance possibly relates to the health focus of such organizations and their inherent supportive orientation to those in need. Why the rental/leasing industry better restores performance is not clear. Results may be skewed by the small number of workgroups from this industry in the sample (1.3%).

Exerting less influence are the remaining industry types – wholesale/retail trade, construction/manufacturing/mining, travel/leisure and professional/scientific/technical. Since trade settings (predominantly retail stores, fast food chains, etc.), represent 19% of workgroups and experience the second highest incidence of criminal acts (robberies), it is noteworthy that they do not restore performance as well as the finance/insurance industry. Construction/manufacturing/mining comprises 10.8% of workgroups and is also less effective in restoring performance. Future studies might investigate possible differences in preventive and intervention services in these settings.

The incident type of criminal act is also a relatively strong predictor, interestingly, the only significant incident predictor. Since criminal acts occur significantly more often in the finance/insurance industry, the explanation for better restoration is similar – a greater focus and more resources on resilience and interventions.

Prior workgroup trauma and incident severity score exert less of an influence but in the same direction. The presence of prior trauma or a higher severity score predicts for less likely performance restoration. There may be a cumulative effect of multiple traumas in a workgroup, making it harder to restore performance and very severe incidents may

exhaust employee coping resources. Despite the low to moderate effect size for these variables, they do predict for compromised performance. Since, on the bivariate level, most of the same variables are significant for perception of adequacy of organizational response, a logistic regression for that outcome, reviewed next, incorporates them as well.

Perceived Adequacy of Organizational Response

Organizations, especially those at higher risk for workplace trauma, strive to be perceived as very supportive of employees and having responded highly adequately to a traumatic incident. In the database, the organization's on-site observer perceived a highly adequate response for 1890 workgroups (66%, N = 2857) and a low to moderately adequate response for 967 workgroups (34%).

Missing Data

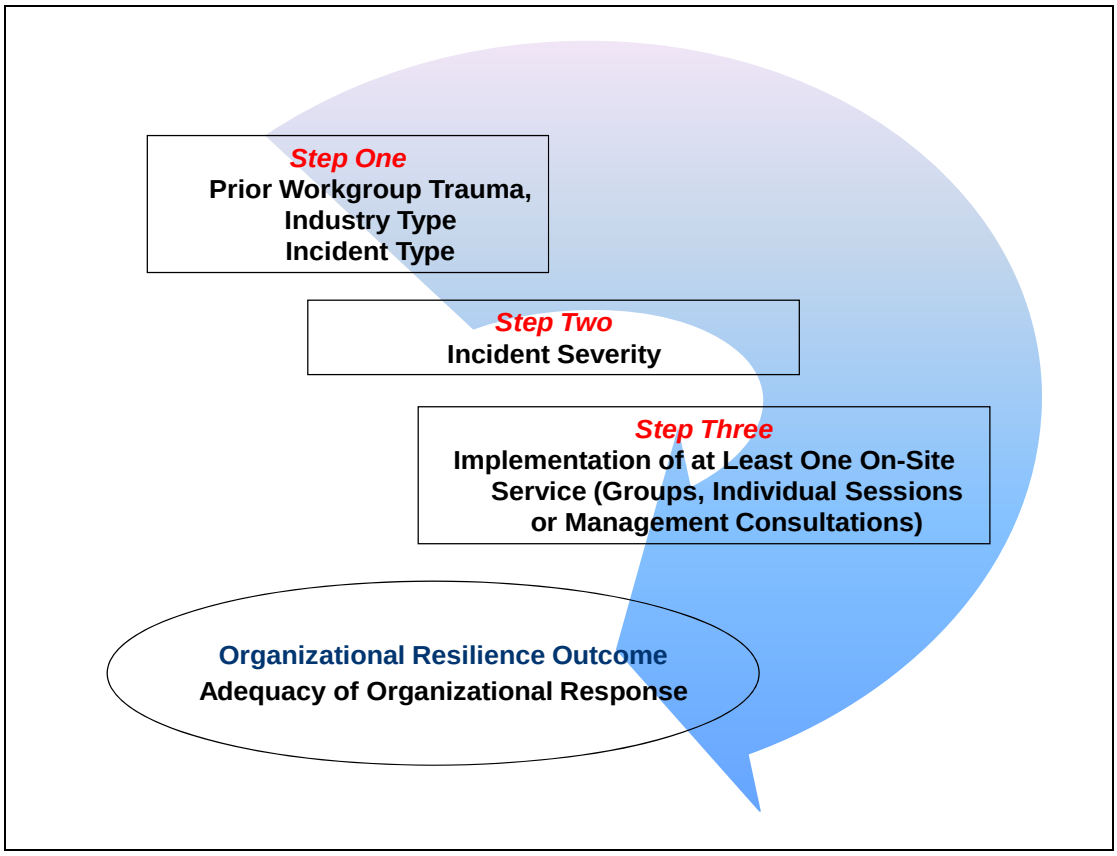
Of the 5181 incidents in the database, the regression analyzed 2601 incidents. While incidents with missing data numbered 2580, the incident to variable ratio requirement is still easily satisfied.

Variables Entered in the Equation

Variables significantly associated with perceived adequacy of organizational response in the bivariate analysis *($p < .05$),* were entered into the model, including

whether prior workgroup trauma occurred, $X^2(1,2601) = 9.549, p = .002;$ industry type, $X^2(9,2857) = 17.123, p = .047$, incident type, $X^2(6, 2857) = 28.544, p= .000,$ the aggregate incident severity score, $t(1935) = 3.076, p = .002$ and whether at least one on-site service was implemented, $X^2(1,2857) = 8.964, p = .003$. Note that variables entered for organizational response are the same as for performance restoration - with one exception. The service factor entered for adequacy of organizational response is whether the organization implemented at least one on-site service, while the service factor entered for performance restoration is group implementation. Figure 8 presents the research proposition, illustrating the projected multivariate influences on perceived adequacy of organizational response.

Figure 8: Multivariate Research Proposition for Adequacy of Organizational Response



Collinearity

An initial linear regression was run to assess for possible collinearity between independent variables. Table 73: Collinearity Statistics – Adequacy of Organizational Response, presents the tolerance and variance inflation factors for each independent variable.

Table 73: Collinearity Statistics - Adequacy of Organizational Response

Model	Tolerance	VIF
Prior Workgroup Trauma	.979	1.021
Industry Type	.695	1.438
Incident Type	.582	1.719
Aggregate Incident Severity Score	.622	1.607
Implementation of On-Site Services	.989	1.011

a. Dependent Variable: Adequacy of Organizational Response

Tolerance values among the predictor variables included are all higher than .1 and variance inflation factors (VIF) with all values less than 10.0 indicates the absence of collinearity.

Hierarchical Logistic Regression

To test the proposition that variables significant at the bivariate level also predict for organizational response at the multivariate level, a hierarchical logistic regression was run, entering variables in three steps. The first step (entering prior workgroup trauma, industry type and incident type) and step two (adding aggregate incident severity score) include the same variables as for performance restoration. Step three however, adds whether an organization implemented at least one on-site service (groups, individual sessions or management consultations). Interestingly, implementation of groups, while significantly associating with performance restoration does not significantly associate with perceived adequacy of organizational response.

Model Fit

Table 74: Full Model Goodness of Fit Tests – Adequacy of Organizational Response, details the results for the Omnibus Tests of Model Coefficients, the Hosmer-Lemeshow Test and – 2 LL.

Table 74: Full Model Goodness of Fit Tests
Adequacy of Organizational Response

	X^2	*df*	*p*
Omnibus Tests of Model Coefficients	52.313	18	.000
Hosmer-Lemeshow Test	6.787	8	.560
-2LL = 3281.903			

The Omnibus Tests of Model Coefficients, $X^2 (18) = 52.313, p = .000$ and the Hosmer-Lemeshow test, $X^2 (8) = 6.787, p = .560$ show the model is statistically reliable in predicting perception of adequacy of organizational response. However, as found with performance restoration, the – 2LL (3281.903) is extremely high, indicating a questionable model fit.

Table 75: Full Model Classification Table for Perception of Adequacy of Organizational Response displays the comparison of the model's prediction for response adequacy with empirically observed response adequacy.

Table 75: Full Model Classification Table for Perception of Adequacy of Organizational Response

		Predicted		
		Organizational Response		
	Observed	Low/Moderately Adequate	Highly Adequate	Percentage Correct
Organizational Response	Low/Moderately Adequate	17	867	1.9%
	Highly Adequate	17	1700	99.0%
	Overall Percentage			66.0%

Cut Value = .500

Overall, the model correctly classified response adequacy for 66% of workgroups. While the accuracy of correctly predicting a highly adequate response is nearly perfect at 99%, the model was extremely inaccurate in predicting a low to moderate response (1.9%).

Regression Coefficients: Variables in the Equation (Step One)

Table 76: Regression Coefficients - Variables in the Equation for Adequacy of Organizational Response (Step One), presents the regression coefficients, Wald statistics and the odds ratios for step one - entering prior workgroup trauma, industry type and incident type.

Table 76: Regression Coefficients - Variables in the Equation for Adequacy of Organizational Response (Step One)

	B	*Wald*	*df*	*Sig.*	*Exp(B)*
Prior Workgroup Trauma	-.249	5.522	1	.019	.780
Industry Type[1, 2]		8.713	9	.464	
Construction, Manufacturing and Mining (1)	-.209	1.332	1	.248	.812
Health, Education and Social Services (2)	-.013	.004	1	.951	.987
Other Services (3)	.394	2.710	1	.100	1.484
Professional, Scientific and Technical (4)	.068	.081	1	.776	1.070
Public Administration (5)	.067	.080	1	.777	1.070
Real Estate and Rental and Leasing (6)	.462	1.247	1	.264	1.587
Trade - Wholesale and Retail (7)	.085	.431	1	.512	1.089
Travel and Liesure (8)	.123	.268	1	.605	1.131
Utilities (9)	-.207	.680	1	.409	.813
Incident Type[1, 3]		16.311	6	.012	
Accident (1)	.892	6.036	1	.014	2.439
Death (2)	.316	6.984	1	.008	1.371
Disaster (3)	.002	.000	1	.994	1.002
Employee Stressor (4)	.102	.120	1	.729	1.107
Illness (5)	.934	5.300	1	.021	2.546
Organizational Change (6)	.007	.001	1	.972	1.007
Constant	.531	58.149	1	.000	1.700

1. Reference category selected as the category where responses are least likely to be perceived as highly adequate
2. Industry Reference Category: Finance and Insurance
3. Incident Reference Category: Criminal Act

Findings. Wald statistics for step one indicate that only four variables predict significantly for a highly adequate perception of an organization's overall response to a traumatic event. First, compared to organizations whose workgroups did not experience prior trauma, those with prior trauma were 28% less likely to be perceived as responding in a highly adequate manner.

For industry type, due to the bivariate finding that a highly positive perception of organizational response is least likely in the finance and insurance industry, this industry is selected as the industry reference category. In comparison to finance/insurance, no other industry is significantly more or less likely to earn a highly positive perception of it's response to the incident.

For incident type, due to the bivariate finding that a highly positive perception of organizational response is least likely to occur following a criminal act, a criminal act is selected as the incident reference category. In comparison to criminal acts, highly perceived adequacy of response is more likely following half of the incident types. A perception of highly adequate response is more than two times more likely following accidents (OR = 2.43) and illness (OR = 2.54) and is 37% more likely following an employee death. In comparison to criminal acts, the remaining incident types (disasters, organizational change and other employee stressors) are not significantly more or less likely to result in a highly positive perception of organizational response to the incident.

Regression Coefficients: Variables in the Equation (Step Two)

Table 77: Regression Coefficients - Variables in the Equation for Adequacy of Organizational Response (Step Two), presents the regression coefficients, Wald statistics and odds ratios for step two - the addition of aggregate incident severity score.

Table 77: Regression Coefficients - Variables in the Equation for Adequacy of Organizational Response (Step Two)

	B	*Wald*	*df*	*Sig.*	*Exp(B)*
Prior Workgroup Trauma	-.248	5.494	1	.019	.780
Industry Type[1, 2]		8.681	9	.467	
Construction, Manufacturing and Mining (1)	-.210	1.345	1	.246	.811
Health, Education and Social Services (2)	-.014	.004	1	.950	.986
Other Services (3)	.392	2.665	1	.103	1.480
Professional, Scientific and Technical (4)	.066	.077	1	.781	1.068
Public Administration (5)	.068	.081	1	.776	1.070
Real Estate and Rental and Leasing (6)	.461	1.242	1	.265	1.585
Trade - Wholesale and Retail (7)	.085	.427	1	.514	1.089
Travel and Liesure (8)	.122	.263	1	.608	1.129
Utilities (9)	-.207	.680	1	.410	.813
Incident Type[1, 3]		14.492	6	.025	
Accident (1)	.889	5.983	1	.014	2.433
Death (2)	.305	4.420	1	.036	1.356
Disaster (3)	.003	.000	1	.991	1.003
Employee Stressor (4)	.092	.093	1	.760	1.096
Illness (5)	.922	4.924	1	.026	2.515
Organizational Change (6)	-.007	.001	1	.977	.993
Aggregate Incident Severity Score	-.002	.019	1	.892	.998
Constant	.557	7.421	1	.006	1.745

1. Reference category selected as the category where responses are least likely to be perceived as highly adequate
2. Industry Reference Category: Finance and Insurance
3. Incident Reference Category: Criminal Act

Findings. Wald statistics for step two indicate that when controlling for the severity of an incident, the same four variables predict significantly for a highly adequate perception of an organization's overall response to a traumatic event. Compared to organizations whose affected workgroups did not experience prior trauma, those with prior trauma were again 28% less likely to be perceived as responding in a highly adequate manner. For industry type, in comparison to finance/insurance, again no other industry is significantly more or less likely to earn a highly positive perception of it's response to the incident.

Controlling for incident severity also does not alter which incident types predict for performance. In comparison to criminal acts, highly perceived adequacy of response

is again more than two times more likely following an accident (OR = 2.43) and illness (OR = 2.51) and is 36% more likely following and employee death. In comparison to criminal acts, the remaining incident types (disasters, organizational change and other employee stressors) are again not significantly more or less likely to result in a highly positive perception of organizational response to the incident. The addition of incident severity to the predictive model does not impact other predictors and is not itself a significant predictor for perceived adequacy of organizational response.

Regression Coefficients: Variables in the Equation (Step Three)

Table 78: Regression Coefficients - Variables in the Equation for Adequacy of Organizational Response (Step Three) presents the regression coefficients, Wald statistics and odds ratios for step three - the addition of whether the organization implemented at least one on-site service.

Table 78: Regression Coefficients - Variables in the Equation for Adequacy of Organizational Response (Step Three)

	B	*Wald*	*df*	*Sig.*	*Exp(B)*
Prior Workgroup Trauma	-.261	6.020	1	.014	.771
Industry Type[1, 2]		8.979	9	.439	
Construction, Manufacturing and Mining (1)	-.239	1.736	1	.188	.787
Health, Education and Social Services (2)	-.044	.040	1	.841	.957
Other Services (3)	.363	2.270	1	.132	1.437
Professional, Scientific and Technical (4)	.047	.039	1	.844	1.048
Public Administration (5)	.039	.027	1	.870	1.040
Real Estate and Rental and Leasing (6)	.476	1.321	1	.250	1.609
Trade - Wholesale and Retail (7)	.077	.351	1	.553	1.080
Travel and Liesure (8)	.097	.167	1	.683	1.102
Utilities (9)	-.233	.856	1	.355	.792
Incident Type[1, 3]		14.201	6	.027	
Accident (1)	.867	5.678	1	.017	2.380
Death (2)	.293	4.076	1	.043	1.340
Disaster (3)	-.001	.000	1	.999	.999
Employee Stressor (4)	.089	.086	1	.769	1.093
Illness (5)	.939	5.096	1	.024	2.558
Organizational Change (6)	-.019	.007	1	.933	.981
Aggregate Incident Severity Score	-.004	.140	1	.709	.996
Implementation of at Least One On-Site Service	.363	9.379	1	.002	1.438
Constant	.299	1.840	1	.175	1.349

1. Reference category selected as the category where responses are least likely to be perceived as highly adequate
2. Industry Reference Category: Finance and Insurance
3. Incident Reference Category: Criminal Act

Findings. For the full model, including the addition of whether an organization implemented at least one on-site service, Wald statistics identified the same predictors and non-predictors as in step two; suggesting the delivery of an on-site service does not impact the predictive model. Within the context of the full model, compared to organizations whose affected workgroups did not experience prior trauma, those with prior trauma were 30% less likely to be perceived as responding in a highly adequate manner, similar to the effect observed at the first two steps. For industry type, in comparison to finance/insurance, again no other industry is significantly more or less likely to earn a highly positive perception of it's response to the incident.

Controlling for on-site services does not alter which *incident* types predict for adequacy of response. In comparison to criminal acts, highly perceived adequacy of response is again more than two times more likely following an accident (OR = 2.38) and illness (OR = 2.55) and is 34% more likely following and employee death. In comparison to criminal acts, the remaining incident types (disasters, organizational change and other employee stressors) are again not significantly more or less likely to result in a highly positive perception of organizational response to the incident.

While in the full model, incident severity remains non-significant as a predictor for perceived adequacy of organizational response, whether an organization implemented at least one on-site service is significant. Organizations that implement at least one on-site service are 43% more likely to be perceived as responding in a highly adequate manner.

Discussion. As noted in chapter one, while critical incidents typically impair performance initially, their enduring impact is mediated by the workgroup's perception of organizational response and support (Bishop et al., 2006; Moayed et al., 2006). Snow et al. (2003), Noblet et al. (2006) and Patton (2007) state that *the manner in which organizations respond* to an incident is as or even more important than the nature of the support. If employees do not perceive the organization as highly responsive, it can result in resentment, anger, increased stress-related illness and increasingly negative organizational outcomes.

In the full model, prior workgroup trauma, three incident types (accident, employee death and illness) and whether on-site services were implemented are significant predictors of perception of adequacy of organizational response. Most exerted

a positive influence on perception. Incident types of illness and accident exerted the strongest positive influence, followed by an employee death. Exerting a moderate and positive influence is the service factor of whether on-site services are implemented. Possibly, the visibility of on-site services communicates to employees the organization is committed to a comprehensive response. Prior workgroup trauma exerted low to moderate influence, but in a negative direction. Its presence predicts a less positive perception of the organization. Possibly, the recurrence of traumatic incidents fosters resentment that employment in certain industries exposes workers to such trauma.

Contrary to bivariate results, in each step of the multivariate analysis no industry type predicts for perception of adequacy of response in either direction. Despite how useful industry specific results would be, other variables such as incident type, prior trauma and on-site services appear to account for the variance.

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Chapter Six

Summary and Implications for Practice and Research

While multiple influences contribute to the selection of a dissertation research topic, two in particular shaped this choice – occupational social work experience and the events of September 11, 2001. First, for twenty-five years, I worked in a major employee assistance program with the longest running and largest critical incident stress management unit, dedicated *solely* to supporting organizations in responding to workplace trauma. Since the early 1990s, the unit kept detailed records of critical incident services to affected workgroups. (Their records now include over 60,000 incidents). Aware that no one had systemically analyzed this rich source of data, I suspected it had potential for untapped knowledge. Second, despite having moved into administration many years before the second attack on the World Trade Center, due to the scope of the disaster, the agency placed all clinicians with trauma training into service. Over a two-week period of conducting interventions in lower Manhattan, I formulated beginning questions about organizational context, organizational response, services and their impact on organizational resilience. The eventual result of pursuing these questions is this exploratory CDM research, which is, to my knowledge, the only large-scale, practice-based study of predictors for organizational resilience to workplace trauma.

The research was undertaken to investigate relationships between workgroup history of trauma, settings, incident types, services and organizational outcomes. The study explored influences of antecedent, independent and intervening variables on several aspects of organizational resilience identified in the literature – performance restoration,

employee retention, employee attendance, service helpfulness and the perceived adequacy of organizational response.

Since this CDM study relies on a convenience sample, a pre-existing database from a single program, it precludes a controlled study, which compromises generalizability. This study, however, does make several important contributions. By mining unexplored data on over 5000 workgroups impacted by workplace trauma, it's findings and discoveries are immediately applicable to the program sponsoring the study. In addition, to the extent that the structure and services of other CISM units are similar to the unit in the study, the results achieve some degree of generalizability. Further, this research explored empirically whether anticipated variables predict for various organizational outcomes within a workgroup following trauma. Finally, while several findings have important implications for practice, others set the stage for future research. Various findings suggest new directions for studies that will improve understanding of factors that predict for organizational resilience.

Univariate Findings: Recommendations for Practice and Research

Criminal Acts. The unit frequently assists organizations with criminal acts (37% of incidents). This incident type aligns most often with the setting of financial environments (39%), which include banks and next with retail trade settings (19%), which include fast food and various retail chains. Workers in these industries are especially vulnerable to this workplace trauma (McCullough, 2008). Since this pattern endures year after year, conducting a literature review and accessing its own extensive

experience to identify specialized services for these settings and this incident type could improve practice. Additionally, retail stores, representing 19% of workgroups served do not restore performance as well as the finance/insurance industry. Exploring this difference and designing more target interventions would be valuable additions to practice as well.

Incident Severity Score Patterns. Considering the mean scores for the scale items, a pattern emerges. Most incidents are characterized by a relatively high number of employees involved in the incident with a moderately high level of exposure. Violence level and media exposure were less severe and most incidents did not notably affect attendance or involve high levels of threat. As above, since this is an enduring pattern, the unit could consider if they can assist workgroups with this incident profile with new or specialized services.

Regional Trends and Organizations Requesting Services. The geographical origin of service requests reflects incident-related characteristics. Organizations in states prone to natural disasters (such as California - for wildfires and earthquakes, and Florida – for hurricanes) requested more assistance than states not vulnerable to those disasters. Another finding is that industrialized states requested more assistance than agriculturally oriented states. Given these enduring trends, the unit could consider developing specialized services for these organizations for these specific incident types.

Acceptance or Declination of Telephonic Follow-Up Services. Out of 9,678 organizations seeking assistance from 2006 – 2008, 53.5% (5,181) agreed to follow-up services, while 46.5% (4,497) declined them. While staff collects this decision on every organization, they only collect additional data (incident types, incident severity, industry

types, services, etc.) on organizations accepting follow-up. Therefore, for comparative purposes, no additional integrated data is available on organizations *declining* follow up. Collecting this data will allow for additional research that targets this decision as an *outcome* variable. It would be useful for CISM units to know if factors such as incident severity, industry type and incident type affect it. Researchers could also consider other relevant variables, such as perceived need for assistance or internal resources available to commit to follow-up contacts.

Acceptance or Declination of On-Site Services. Out of 5,181 organizations accepting follow-up, 86.9% (4,500) indicated a willingness to implement on-site services, while 13.1% (681) declined them. While this study treats this decision as an independent variable for organizational outcomes, it would be valuable to research this decision as an outcome as well. In doing so, it would be important to consider the business model (fee arrangements) for services. Some EAPs provide services under an all-inclusive fee while others provide them on a fee-for-service basis and still others offer a combination of both arrangements (a certain number of services under annual fees and additional services at fee-for-service costs). A future question to explore is whether the business model influences an organization's decision for or against implementing on-site services.

Implementation of On-Site Services. Related to the above, while 86.9% of organizations intended to provide on-site services, unit staff actually implemented at least one type of on-site service for somewhat fewer incidents, 84%. Business model may have influenced this lack of follow through as well and there are other possible explanations to explore. As the situation stabilizes, organizations may decide they do not need services

after all or other variables, such as incident severity or incident type may influence this variable as an outcome.

Non-Implementation of Groups. For 41.2% of organizations, the unit did not deliver on-site group sessions. Further exploration of reasons might include if attendance is voluntary and whether organizations schedule groups immediately after the incident – overestimating impact, employee's need and employee's willingness to attend. Additionally, if incidents are not severe and employees seem to be adjusting well, the organization may later perceive minimal benefits derive from the costs and organizational resources required to provide the groups and cancel them. Another possibility is whether the relationship between employees and management is problematic and if an incident exacerbates tensions, resulting in employees refusing to attend.

Impact of Telephonic Follow-up Services vs. On-Site Services. Another future research design of interest would be to test for outcomes subsequent to telephonic follow-up services (16% of the sample) versus on-site services (84%). Specifically, is there a difference between outcomes for workgroups that receive telephonic services only and those that receive both?

Follow-Up Service Completion. Initially, at two days post incident, telephonic follow-up completion rates are quite good (85.6%) but decline by the second follow-up at four-weeks (66.4%). What influences the decline at four weeks? It may relate to a lack of response from the client organization contacts, distracting organizational circumstances, an incident of low severity or a perception that organizational recovery progressed to a level where further contact with the unit was deemed unnecessary.

Critical Incidents vs. Organizational Incidents. The incident categories in this study potentially group into two overall categories – critical incidents (which are usually traumatic) vs. organizational incidents (which typically are not). Traumatic critical incidents include deaths, criminal acts, accidents, disasters, etc. Non-traumatic organizational incidents include organizational change (downsizing) and various employee stressors (interpersonal conflicts, job related stress, stress from a peer's crisis). Unlike traumatic critical incidents, which are extreme incidents, severe in nature and often unpredictable, non-traumatic organizational incidents tend to have the reverse characteristics. Such incidents, while non-traumatic, still create significant distress for organizations and workers and warrant intervention and support. However, since this differentiation may be a confounding variable future studies could isolate and compare the two overall incident types and re-run analyses, with possibly different results.

Public Facing vs. Non-Public-Facing Industries. Industry type can also group into two overall categorizes – public-facing and non-public facing settings. Certain industries have significant exposure to the public (banks, retail stores, health, education and social services, public administration, travel and leisure) while others are less exposed (construction sites, utilities, etc.). Future investigators might pursue if public facing and non-public facing settings types yield different results for organizational resilience.

Improvement in Performance Restoration. At two days post-incident, 41% of observers at least agree (strongly agree or agree) that workgroup performance restored to levels observed prior to the incident. At four weeks, agreement increases to 81%. Practice wisdom suggests and results confirm that workgroup performance at four weeks post incident is much less compromised than at two days. This is consistent with the course of

trauma response and recovery, with most symptoms resolving within four weeks for most employees (APA, 2000; Breslau et al., 1998; Harvey & Bryant, 1998).

Social Workers as Organizational Trainers. A review of the prevalence of social work practitioners involved in the program in the study revealed an interesting inconsistency. While social workers comprise 27% of the organization's employees, 43% of counselors in the external short-term EAP counseling network, 35% of providers in the behavioral health network and 75% of providers in the critical incident provider network, social workers comprise only 12% of the EAP's network of workplace trainers. This raises a question about why social workers represent a significantly lesser portion of workplace trainers, compared to their other roles. Possibilities to consider are whether graduate training promotes presentation skills or if social workers (or curriculums) are more oriented towards individual and clinical activities than organizational activities. Since presenting publically and training employees and managers in organizational settings are valued competencies in occupational social work, graduate schools and EAP training programs should consider this question further.

CrISIS Scale Findings

A Cronbach's Alpha, computed for the original nine-item agency scale to measure the severity of an incident, yielded a very low Alpha (.315). Inter-item correlations suggested three items; injury level, group history of trauma and advanced knowledge of events compromised reliability. A series of scale reliability analyses determined empirically that deletion of first, injury level, second, group history of trauma and third,

advanced knowledge of events, increases Cronbach's Alpha, to .68. Further item deletions do not improve Cronbach's Alpha. While this falls short of the desired range of .8 to .9 and limits to some extent, confidence in findings involving incident severity, it represents a significant improvement for a practice-based, inductively informed scale. From this initial improvement, staff will be able to continue to refine the scale empirically by considering the appropriateness of adding other items to the scale. Future factor analysis will also likely yield important results. This scale represents an important contribution to the field of workplace trauma by introducing a measure of incidents, rather than impact of event on individuals.

Bivariate Findings: Recommendations for Practice and Research

Bivariate Results Overview. Only two outcome variables, performance restoration at two days and perceived adequacy of organizational response associated significantly with multiple independent variables. Significant variables for both with small affects were prior workgroup trauma, industry type, incident type and whether organizations intended to implement on-site services. Incident severity was also significant for both with a moderate effect on performance restoration at two days and a small effect on perceived adequacy of organizational response. In terms of the impact of services, implementation of groups was significant for performance while implementation of at least one on-site service was significant for organizational response. Both were small effects, however. Only two independent variables were significant for performance at four weeks - incident severity (moderate effect size) and whether organizations intended

to implement at least one on-site service (small effect). Significant independent variables associating with retention within the organization and retention within the affected workgroup are incident severity (large effect for both) and prior trauma (small effect). Sustained attendance associates significantly with only one variable - incident severity, and the effect was moderate. Service helpfulness for employees also relates significantly to one variable – implementation of individual sessions, with a small effect. Finally, three independent variables were significant for service helpfulness for management - implementation of individual sessions, implementation of management consultations and follow-up completion at four weeks. All effects were again small.

Due to incident severity's potentially critical impact on outcomes, I analyzed its association with several other independent variables. Significant findings with moderate to large effect sizes were found. Severity scores differed significantly by whether a workgroup experienced prior trauma, industry type, incident type, incident subtype, implementation of groups and follow-up services at both two days and four weeks.

Prior Workgroup Trauma. There is an inverse relationship between the experience of a prior organizational trauma and several outcomes. Based on Chi-square results prior trauma is significant for reduced performance restoration at two days (but not at four weeks), for both retention within the organization post incident and retention within the affected workgroup and whether the organization is perceived to have responded highly adequately to the workgroup's traumatic event. The effect sizes, however, are weak in all cases. Since organizations hold themselves (or communities hold them) accountable to adequately responding to workplace trauma, it would be useful for organizations to know whether their critical incident response is viewed more or less

adequately with repetitive workgroup incidents. Further research could further explore both this question and how repetitive incidents affect other organizational outcomes.

Industry Type. Insight into whether certain industries have better resilience for performance at two days and four weeks is an important question. Since the finance/insurance industry ranked significantly higher for performance restoration, a question to pursue is whether its repetitive incidents or specialized prevention programs account for this result. Along the same lines, do health/education/social services' high rank for performance relate to their health orientation towards employees? Why public administration and utilities appear to have less resilience is a critical question for those industries.

For perceived adequacy of organizational response, it is curious that the finance/insurance industry, the most experienced with critical incidents, significantly achieved the *lowest* industry percent for a highly adequate organizational response while the real estate industry, with the fewest incidents achieved the *highest* percent. Whether characteristics of the financial industry (such as its tendency for repetitive incidents) and real estate and rentals (such as its dispersed, small offices) associate with these results could be topics for future research.

Incident Type. The impact of incident type is significant for performance at two days and for perception of adequacy of organization response. It is somewhat surprising that while criminal acts tend to be severe incidents, workgroups experiencing them restore performance at the highest percent. This may be again due to the repetitive nature of criminal acts in the financial industry and its focused attention on employee training and support. The massive devastation of disasters may account for their producing the

least percent of performance restoration observed. For perception of adequacy of organizational response, illnesses and accidents account for the largest percent of high perception of adequacy (in contrast to their accounting for lower percents of performance restoration at two days). This suggests two different lenses through which to view organizational outcomes to workplace trauma – actual functional organizational adaptation vs. positive perception of organizational response. It is also interesting that criminal acts associate with a lower perception of adequacy of organizational response. Perhaps this relates to the repetitive occurrence of robberies in the financial industry and that employees hold financial employers responsible for robbery prevention. Disasters associate with the lowest percent of highly adequate response. This may relate to employer's limited ability to intervene with the large-scale environmental damage typical of disasters. All are viable questions for future research.

Incident Severity. Incident severity score significantly associated with several other independent variables. Severity is higher when a workgroup experienced a prior traumatic incident. This suggests that industries experiencing multiple incidents also tended to experience more severe incidents. This is consistent with the large prevalence of financial organizations (banks) experiencing repetitive criminal acts (robberies). Severity differed significantly among industries with the following ranking from highest to lowest mean severity scores: finance/insurance, wholesale and retail trade, real estate/rental/leasing, utilities, public administration, travel/leisure, health/education/social services, construction/manufacturing/mining and professional/scientific/technical. Mean severity scores also differed significantly among incident types with the following

ranking: disasters, criminal act, accident, employee stressors, death, illness and organizational change.

As anticipated, the more severe an incident, the more likely an organization was to accept on-site services, implement groups, implement at least one of the on-site services and complete follow-up at both two days and four weeks - as part of their response plan. Curiously, the effect for management consultations is *negative*. Slightly *less* severe incidents resulted in *more* organizations implementing on-site manager consultations. Also not anticipated is that severity score is not significant for on-site individual counseling sessions. A possible explanation, warranting further study, is that as counselors conduct on-site groups, they identify individuals in extreme stress and offer counseling after the group ends. Therefore, individual differences (random occurrence of a highly distressed employee), rather than incident differences, may better account for whether individual sessions occur.

For organizational outcomes, more severe incidents associate with underperformance at both timeframes, resignation from the organization, employee transfers out of the affected workgroup and poor attendance. Results also indicate that the more severe is the incident, the less positively the organization's response is perceived. Whether employees experiencing more severe incidents have more difficulty adjusting post-incident or are less committed to the organization or workgroup are important questions that merit further consideration.

Initial Organizational Decision for Implementing On-Site Services. While no associations are strong in effect, counter to expectations, performance restoration at two days and retention within the affected workgroup are *better* when the organization

declined on-site services. Research should target possible intervening factors that mitigate negative impacts on performance and retention. For example, if organizations that decline on-site services experience less severe incidents, that may explain restored performance and retention within the workgroup. Controlling for these influences may produce different findings. The initial decision regarding on-site services, however, associates positively with perception of adequacy of organizational response.

*Implementation of On-Site Individual Counseling***.** Whether an organization implemented on-site individual counseling sessions significantly associates only with whether services were helpful for employees and for management and with weak effect. This finding and the lack of significance for all other outcomes suggests that while individual counseling may be valued by employees and managers, it contributes very little or not at all to organizational resilience. This possibly counterintuitive result requires further study.

Implementation of On-Site Management Consultations. As logic would dictate, management consultations contribute to a perception of services as helpful *to* management. However, these preliminary, exploratory findings do not support practitioners' assumption that management consultations also assist in organizational recovery. This suggests a need for further research investigating whether the activities managers find helpful to them differ from those contributing to organizational resilience.

Implementation of At Least One On-Site Service. The finding that implementation of at least one of the on-site services contributes only to perception of adequacy of organizational response is surprising and counters thinking that the presence of counselors on-site post incident is important to functional organizational recovery.

Completion of Follow-Up Services. There are no meaningful and significant associations with any outcomes and follow-up at two days or four weeks. This suggests that while serving important functions - to assess for continued needs, offer additional services and obtain outcome data - the completion of follow-up calls to affected organizations does not itself contribute to organizational outcomes. A question emerges from this observation. To what degree do follow-up calls focus on data collection versus further assessment and support?

While these bivariate results suggest specific variables associate with certain organizational outcomes, they were considered tentative for two reasons. First, since finding significant associations is a known tendency with large samples (N = 5181), evaluating effect size is essential and many observed effects are indeed, very small, rendering results tentative. Second, single bivariate correlations do not control for intervening variables or for interactions between variables. Therefore, a multivariate analysis was conducted to assess for variables' combined effect on two selected outcomes.

Multivariate Findings

In the full model for predicting *performance restoration at two days*, prior workgroup trauma and incident severity exert influence in the same direction - negatively. The presence of prior trauma and a high severity score predict for less likely performance restoration, possibly related to a cumulative effects of multiple traumas and the fact that very severe incidents may exhaust employee coping resources. Despite the

low to moderate effect size for these two variables, they do predict for compromised performance. Therefore, when staff determines they apply to an incident they, and affected organizations, should consider delivering specialized services or longer-term services. Industry settings of finance/insurance, health/education/social services and rental/leasing, and the sole incident type of criminal act were the strongest positive predictors for performance. Remaining industries were less influential.

Surprisingly not significant at the multivariate level is whether groups were implemented. Groups are a central component of most post-incident response strategies. While this potentially raises questions about the value of on-site groups, group implementation did approach significance (*p = .086).* If an alternate, more complex group-related variable were tested, for example, number of groups provided over time (dosage), specific types of group intervention, counselor's credentials or extent of provider's trauma training, perhaps their influence would be significant.

In the full model for predictors of perception of *adequacy of organizational response*, prior workgroup trauma exerted a low to moderate, negative influence. Its presence predicts a less positive perception of the organization, possibly related to the recurrence of traumatic incidents. The strongest positive predictors were incident types of illness and accident. Exerting less influence but still significant were employee death and implementation of at least one on-site service. Surprisingly, incident severity, which figured prominently in the bivariate analyses and the multivariate findings for performance restoration, is not a significant predictor for perception of organizational response. Additionally, controlling for incident severity had no impact on other variables in the model.

Comparison of Models: Performance vs. Perceived Organizational Response. The sole difference in variables entered in the models for performance and perception of organizational response was the service variable entered. Implementation of groups was entered for performance whereas implementation of at least one on-site service was entered for perception of organizational response. Despite similar models, different predictors emerged. The most striking differences are first, that *industry* is a significant predictor for performance and not at all a predictor for perception of organizational response and second, *incident type* is not a major predictor for performance but is significant for perception of organizational response.

Further, incident severity has a differential impact on the two models. When controlling for incident severity in step two for organizational response, more incident types remain predictors than seen for performance restoration. Additionally, incident severity itself, predicts for performance restoration but not for organizational response. Finally, the service variable, implementation of groups is not a predictor for performance whereas the service variable, implementation of at least one on-site service does predict for perception of organizational response. This suggests that different factors influence a functional versus an image-related outcome.

Most practitioners believe that employee perception of meaningful support and adequate responsiveness on the part of the employer appears to facilitate a climate of recovery or at least, its absence compromises recovery. Results here, while not definitive, justify further inquiry into which factors may influence such perceptions.

Retention and Attendance. Multivariate analyses for outcomes not conducted here for employee retention, sustained attendance and helpfulness of services are possible future CDM research topics.

Controlled Studies. Finally, researchers should further pursue the relationships studied here in prospective, controlled research designs.

Study Limitations

Unavailable Data on Group Interventions. On-site group interventions implemented by the unit's providers typically include formal critical incident stress debriefing, psychological first aid and crisis management briefing. Further, since the unit does not constrain provider judgment in delivering appropriate interventions, other forms of interventions inevitably occur. The unit staff however, does not capture *which* type of intervention providers deliver to specific workgroups. Further, the unit does not capture whether workgroups receive only a single intervention or a sequence, a measure of dosage, an equally important variable. In addition, relevant variables not available for testing were profession of group practitioners or their extent and type of training. While on-site group services are central variables for organizational outcomes, this study was limited to exploring only whether they occurred, rather than exactly what occurred or how much occurred. If the unit can add this additional information to the data collected, it would allow for a look inside this "black box" (Hanssen, 2003; Hanssen & Epstein, 2006). The result could well be definitive conclusions about whether on-site groups (an intervention many consider central to critical incident response) affect outcomes. More

specifically, further research may reveal which *types* of groups play a role in organizational resilience.

Unusable Service Counts. The unit collects extensive data on the number of on-site services (groups, individual sessions, management consultations) delivered to organizations ranging in size from two hundred employees to two hundred thousand. By virtue of size alone, large organizations may implement more units of service whereas small employers may implement less. Since there was no reliable way to control for the effect of organizational size, any findings of association between the units of service would be problematic. Therefore, these variables were reduced to *whether* an organization implemented a certain service. If the unit can incorporate organizational population into the database, it would allow for computing ratio variables (number of groups, individuals counseled, number of managers consulted and total units of service delivered to population). This data could then be explored for association with outcome variables and may inform organizational resilience in large versus small organizations.

Limited Chi Square Results. In a CDM study relying on available data designed to support practice, as opposed to research, data is not always well suited for statistical analysis. This proved true here where many key bivariate associations of interest were not analyzable due to invalid X^2 tests. A related limitation is that in order to increase the number of valid tests of association, reducing some variables to dichotomous versions resulted in limiting important variance and possibly led to less informative findings.

Logistic Regression and Model Fit. Of the various indicators for model fit, for both regressions, the Omnibus Tests of Model Coefficients and the Hosmer-Lemeshow Tests indicated a very good model fit, while the -2 Log Likelihood values indicated poor

model fits. While the classification tables indicate the models were largely accurate for performance restoration (80%) and perceptions of adequacy of organizational response (66%), false positives occurred. Practitioners are therefore, cautioned against withholding or reducing services until more definitive results are obtained.

Recommendations for Improving Survey Administration

This research evolved through several stages, including investigating program services and procedures, reviewing the unit's post-incident survey, examining the unit-constructed incident severity instrument, screening data and three levels of analysis. In the course of working through these stages, I observed several ways the unit could potentially improve survey administration.

To measure workgroup recovery, the unit continues to include three variables related to workgroup atmosphere and eight covering employee symptoms of post-traumatic stress. Despite procedure calling for staff to use a Likert scale to record responses, only a pre-populated, default response (the scale midpoint) records for most incidents. If this is valuable information, why are staff not collecting or recording it? Perhaps staff perceives the questions interfere with appropriate service delivery or that certain client organization situations post-incident contraindicate this line of inquiry. Another survey issue is the inconsistency with which staff interprets how to enter data for subsequent trauma at four and eight weeks. Better understanding what is occurring in these situations may lead to unit collecting this information more accurately, or if the information is deemed not essential, eliminating these data elements from surveys.

Other improvements to the accuracy of survey data include correcting the database malfunction for resignations, transfers and extended leaves, which involves overwriting four-week data with eight-week data. This results in the loss of potentially useful information on organizational recovery over time. The unit also records the State where the incident occurred and then, based on criteria set long ago (and no longer clear), assigns predetermined states to specific regions (North, South, Mid-West and West). I suggest staff reconsider the assignments. For example, currently Delaware assigns to the "South". Exploring why some states assign to a particular region and considering criteria that reflect certain geographic standards or other guidelines could make collection and interpretation of this variable more meaningful.

Finally, refining record keeping on provider service time to separate out travel from on-site time will allow for capturing valuable information on dosage and more discriminating ways to record profession of providers could provide important information as well.

Conclusion

This study expanded on the well-developed concept of individual resilience and applied them to the less studied concept of organizational resilience. The research confirms that the CISM unit in the study is effective in supporting organizations in several ways that contribute to organizational resilience and suggests that other similarly structured units would be effective as well.

The available CISM database offered a unique opportunity to explore multiple bivariate associations of independent variables with eight organizational outcomes. It further supported conducting multivariate analyses for two central aspects of organizational resilience following workplace trauma in – whether certain independent variables predict if the affected workgroup restored their performance to previous levels and whether the organization responding to the incident is perceived by an internal observer to have responded highly adequately to the event.

In closing, as noted in the introduction, workplace trauma represents an expanding field of practice for social work. Traumatic incidents occur in the workplace at an increasingly alarming rate (Bureau of Labor Statistics, 2010, Federal Bureau of Investigation, 2008, OSHA, 2007) and workers in transportation, emergency services, financial industries, retail settings and health and social services remain particularly vulnerable (Bolton et al., 2004; Rick et al., 2004). The wars in Iraq and Afghanistan, natural disasters and extensive media attention to public violence have contributed to post-traumatic stress emerging as a major public health concern. In response, social workers are instrumental in addressing the consequences of trauma on both individual and organizational levels (Brewin et al., 1999; Kleinberg, 2005). Social workers are particularly well prepared to intervene in pre and post-incident organizational environments in ways critical for improving workgroup functioning and organizational resilience. Through their work in employee assistance programs, critical incident stress units, non-profit agencies and private practice, social workers comprise, by far, the largest portion of mental health professionals responding to workplace trauma (American Red Cross, 2000, Leslie, 2008, Webb, 2000). In view of these trends, in the years to

come, the study of organizational resilience to workplace trauma will remain relevant to the social work profession in general and to occupational social work in particular.

APPENDICIES

Appendix A

Post-Incident Organizational Factors

Contextual Factors

- supportiveness of work atmosphere
- instrumental, practical support
- informational interventions for use in coping
- modeling problem-solving
- provision of adequate information
- visibility of management gestures
- extent of reassuring physical presence by management
- empathetic listening by management
- provision of flexible schedules and work demands
- subsequent workplace trauma
- conflict of interest between organizational vs. employee needs
- nature of manager response
- manager competence in handling emotions triggered by crisis

Employee Perceptions

- perceived job satisfaction
- perceived availability of support
- perceived receipt of support
- perceived helpfulness of interventions
- perceived level of respect from management
- perceived level of management competence
- perceived level of management concern for employee's welfare
- perceived employer fairness
- perceived job security
- perceived relevance of work to one's future
- employee perception of the event
- employee perception of impacts of event on self
- employee perception of impacts of event on organization
- employee perception of effectiveness of overall organizational response
- management perception of the event
- management perception of impacts
- management perception of effectiveness of overall organizational response

Workgroup Symptoms

- reduced employee health
- panicked decision making
- poor concentration
- blaming others and organization
- anxiety, fearfulness of future incidents
- avoidance coping
- post-traumatic stress disorder
- lower morale
- acute stress disorder
- job stress
- irritability
- sadness
- startle response
- avoidance of reminders
- hypervigilance

Appendix B

Organizational Outcomes of Workplace Stress

Performance Impacts
- reduced productivity
- poor work quality
- inability to perform job functions
- engaging in unsafe work behavior
- decreased performance level
- conflict with co-workers
- job neglect, job withdrawal behavior
- negative interaction with co-workers
- negative interaction with management

Legal/Economic Impacts
- worker compensation claims
- disability claims
- lawsuits
- increased grievances filed

Engagement Impacts
- reduced desire to stay in job
- increased absenteeism
- increased sick leave
- burnout – exhaustion
- burnout – disengagement
- declining organizational commitment
- diminished motivation
- decreased organizational assimilation (strength of integration into work life)
- rejection of one's role in the organization
- rejection of leadership, management
- reduced satisfaction with nature of work
- reduced satisfaction with benefits, salary, schedule
- reduced satisfaction with working conditions, environment
- reduced satisfaction with management
- reduced satisfaction with co-workers, team members
- leave of absence
- transfer out of workgroup
- resignation

Organizational Mission Impacts
- negative impact on organization clients
- negative impact on organizational success

Appendix C

Appraisal Theories

Stress Theory

Cannon (1927) theorized employee symptoms and behaviors may operate as adaptive mechanisms of escape (flight), aggression (fight) or freezing, all of which can significantly interfere with work relationships and performance, producing organizational consequences such as low productivity, impaired work relationships or resignation. Selye (1956), defined the general stress response as an adaptive syndrome. Selye identified three stages of stress. First, there is a state of alarm (“fight or flight"). Second, since the alarm level is unsustainable, resistance to the stressor’s effects develops and adaptation ensues. If stress is chronic, a third stage occurs, characterized by a gradual loss of functioning, exhaustion and eventual breakdown. Post-incident, employee behavior, viewed through this lens, is an expression of adaptation or breakdown. Examples of attempts at adaptation include poor concentration, avoidance behavior, blaming others, hyperawareness, job withdrawal behavior or resignation. Examples of breakdown include inability to perform job functions, engaging in unsafe work behavior, decreased performance level and negative interaction with co-workers.

Psychodynamic Theory

The psychodynamic perspective is particularly individualistic, focusing minimally on social, contextual issues. While acknowledging the important role of social environment, it emphasizes intra-psychic phenomenon (M. Payne, 2005). Ego functions, including reality testing, regulation and control, object relations, adaptive regression, defensive functioning and maintenance of mastery and competence, all have relevance for adaptation to stress. While relevant to organizational context, psychodynamic theory is mainly explanatory on an individual level. In contrast, organizational responses to workplace trauma involve mainly contextual modification. Whereas organizational intervention often occurs on a group level and is supportive in nature, psychodynamic approaches require individual and sequential interventions, making them unfeasible for use in most post-incident work settings.

Crisis Intervention Theory

Lindemann identified post-trauma adjustment in terms of severity and timing. He described individuals with mild to extreme reactions and with immediate to delayed reactions. Lindemann proposed specific interventions to assist with coping with the process of recovery. His approach, based largely on psychodynamic principles of loss, was to work with individuals over a multi-session format. Lindemann’s work represents one of the first interventions designed specifically for those exposed to traumatic stress. His work was the beginning of a discourse that eventually led to the adoption of PTSD and later ASD as formal diagnoses. Gerald Caplan (1964), building on the work of Lindemann, developed modern crisis intervention theory, with predictable stages and brief interventions. Several authors (G. Caplan, 1964; G. Caplan et al., 1986; Mitchell, 1983, 1986, 2004; Parad, 1965) see crisis as an obstacle to maintaining a person’s steady state or homeostasis. The obstacle, which cannot be mastered through typical problem solving, signals danger and threat to the person’s fundamental needs. The first stage of crisis is initial anxiety. In the second stage, continuing anxiety disrupts daily living. In the third stage, psychological symptoms occur and in the fourth, either breakdown or adaptation occurs.

Cognitive Behavioral Theory

Based on the concept that all behavior is learned, cognitive behavioral theory assumes that all dysfunctional processes originate with external events. Since individual perceptions and thoughts about experience drive learned behavior, a person can learn new behavior and thinking that resolves presenting problems. Behavior is dependent upon interpretations of environmental events, interpretations that can derive from misperception and distortion, which in turn, foster counterproductive behavior that underlies symptoms. Cognitive behavioral therapy (CBT) consists of therapeutic procedures targeting altering thoughts and feelings alongside changing behavior. CBT is relevant to threatening events (Meichenbaum, 1977). Until employees generate new beliefs, restoring a sense of safety and attachment, the event is likely to remain in active memory and trigger intrusive thought, avoidance, hypervigilance and other symptoms. While CISM incorporates principles of CBT into its various components and elements of CBT are discernable in on-site interventions, CBT is most effective when involving continuous and intermittent reinforcements on an interval schedule. It is therefore not feasible for single-session groups requiring support immediately following workplace trauma.

Triple Vulnerability Model

Barlow (2003) presents the triple vulnerability model (biological vulnerabilities, psychological vulnerabilities and vulnerabilities related to characteristics of events) as a way to predict the degree of resilience or anxiety following an event. Barlow characterizes anxiety as an emotional sense that events are out of one's control. The sense of loss of control then extends to anticipating future threats, resulting in a state of perceived helplessness to influence desired results. Those immediately experiencing workplace trauma experience initial fear and subsequently, anticipatory anxiety about future events. Several employee symptoms and behaviors following workplace trauma are compatible with these processes.

Transactional Model

According to transactional models of stress (Cox, Wilson, & Corlett, 1990; Lazarus & Folkman, 1984; Lazarus, Folkman, & Monat, 1991), an individual’s appraisal and choice of coping response mediate the outcome of a stressful transaction. The transactional model views an individual's responses to extreme situations as a consequence of transactions between the individual, their internal processes and external environment. Stress is the result of an imbalance between perceived demands and a perceived capability to meet demands. This imbalance presents itself as emotional, psychological and physiological responses, which themselves generate additional demands. It is evident that employee stress symptoms following critical incidents fit within this conceptualization

Appendix D: All-Incident Database

Incident Requests by State/Location: 2006 - 2008

Location	# Incidents	%	Location	# Incidents	%
California	943	9.7%	DC	79	0.8%
Texas	787	8.1%	Iowa	76	0.8%
Florida	629	6.5%	Oklahoma	75	0.8%
Georgia	543	5.6%	Nevada	74	0.8%
Pennsylvania	445	4.6%	Wisconsin	67	0.7%
Ohio	381	3.9%	Utah	58	0.6%
New York	374	3.9%	New Mexico	55	0.6%
North Carolina	328	3.4%	Kansas	52	0.5%
Virginia	326	3.4%	Nebraska	50	0.5%
New Jersey	297	3.1%	West Virginia	44	0.5%
Illinois	283	2.9%	Delaware	40	0.4%
Missouri	270	2.8%	Idaho	37	0.4%
Tennessee	263	2.7%	Rhode Island	35	0.4%
Maryland	252	2.6%	Hawaii	34	0.4%
Washington	247	2.6%	Arkansas	32	0.3%
Alabama	200	2.1%	Maine	30	0.3%
Louisiana	196	2.0%	New Hampshire	26	0.3%
Massachusetts	188	1.9%	South Dakota	22	0.2%
Colorado	186	1.9%	Vermont	18	0.2%
Arizona	178	1.8%	North Dakota	17	0.2%
Michigan	175	1.8%	Wyoming	13	0.1%
Alaska	166	1.7%	Montana	8	0.1%
Indiana	135	1.4%	Outside Continental Unites States		
Oregon	132	1.4%	US Virgin Islands	33	0.3%
Kentucky	130	1.3%	Canada	7	0.1%
South Carolina	98	1.0%	Puerto Rico	5	0.1%
Connecticut	98	1.0%	Other International	10	0.1%
Mississippi	92	1.0%	Missing	248	2.7%
Minnesota	91	0.9%	Total Incidents	9,678	100%

Appendix D: All-Incident Database, cont.

Number of Incidents by Incidents Type: 2006 - 2008

	# Incidents	%
Death	3,676	38.0%
Criminal Act	2,513	26.0%
Organizational Change	1,353	14.0%
Accident	717	7.4%
Illness	202	2.1%
Disaster - Natural & Industrial	231	2.4%
Other Employee Stressor	135	1.4%
Terrorism	17	1.1%
Missing	834	8.6%
Total Incidents	9,678	100.0%

Requests for Assistance with a Critical Incident and Requestor Decision Regarding Follow-up Services: 2006 - 2008

	# Incidents	%
Organizations Accepting Follow-Up Services	5,181	46.5%
Organizations Declining Follow-Up Services	4,497	53.5%
Total Incidents	9,678	100.0%

Appendix E: Data Extraction Template

General Incident Information

- Year Reference Number: This number indicates the incident year and which number a specific incident represents within that year (i.e. “6-0052” represents the fifty-second incident occurring in 2006, “8-0689” represents incident number 689, occurring in 2008)
- Incident Identifier: This is a unique, sequential incident identifier automatically assigned by the units tracking application (i.e. incident number “22536”)
- Incident date

Next, the template organizes variables according to the unit team that collects the data.

Intake Phase Fields:

- State
- Region
- Type of industry
- Type of incident
- Type of incident
- Mix employee direct/indirect involvement
- Extent of violence
- Extent of illness or injury
- Shared history of trauma
- Impact on productivity
- Level of exposure
- Advance knowledge of event
- Level of threat
- Media involvement
- Aggregate severity score
- Severity category
- Initial decision for on-site services

Service Phase Fields:

- Follow-up services acceptance or decline
- Number of groups provided
- Number of employees attending groups
- Number of individual sessions
- Number of management consultations
- Total Reported on-site services

Follow-Up Phase One Fields:

- Prior workgroup trauma
- Prior trauma Comments
- Whether follow up services implemented T1
- Intervention helpfulness for employees
- Intervention helpfulness for managers
- Restored performance T1

Follow-Up Phase Two Fields:

- Whether follow up services implemented T2
- Observer satisfaction with organization
- Comments on organizational satisfaction
- Restored performance T2
- Extended Leave T1

Follow-Up Phase Three Fields:

- Whether follow up services implemented T3
- Subsequent workgroup trauma
- Subsequent trauma comments
- Restored performance T3
- Resignations
- Transfers
- Extended Leave T2

Additional Template Information

- Variable identifier number
- Variable data label
- Descriptive notes about each variable
- Timeframe for variable data collection (T1, T2, T3)
- Source of data (Access database or CISM AS400 server)
- Pre-set SPSS codes for each variable
- Incident phase with which the variable aligns
- Method of data entry
    - Staff manual entry
    - Staff selection from pre-set drop-down menu
    - Auto population as linked with another database
    - Auto calculation based on other data elements

Appendix F

Critical Incident Severity Index Scale (CrISIS) Scoring Key - Part 1

Index		Overall Guidelines
1	Employees DIRECTLY impacted + Employees INDIRECTLY impacted divided by TOTAL POPULATION	This will include the employees most immediately involved in the critical incident (i.e., teller who received the robbery note; employee injured/killed in an accident). This will include those employees impacted by the critical incident but possibly to a lesser extent due to their more peripheral involvement (i.e., bank employees who may not have received the robbery note, but were at the bank during the robbery; coworkers of an employee who has died offsite). Overall score is based on total % affected on site – whether directly impacted or indirectly. Total % impacted determines score.
2	Extent of Violence	This index measures the amount of violence in the nature of the event. Some events score a "0" due to no level of violence (i.e., organizational crisis, natural death). Others involving violence by external force can include motor vehicles, weapons, physical attacks and homicides.
3	Extent of Injury	Measures the level of physical injures incurred as a result of the critical incident
4	Shared History of Trauma	This index focuses on the group history with prior incidents with the score contingent upon the length of time between this incident and the previous one. For, example, this might be the second robbery for a bank branch in the past 7 months.
5	Impact on Productivity	In scoring this index, consider time away from duties (i.e., attending funeral/wake/memorial service, site closing due to criminal investigation or storm damage.
6	Level of exposure to critical incident	The key factors in scoring this index are determining whether or not the incident was witnessed by employees and/or occurred on or off the worksite.
7	Advanced Knowledge	Measures the level of perception of prior indication or warning of a critical incident. Scoring is based on the employees' perception (i.e., management may be aware of impending organizational crisis but employees may be completely unaware).
8	Threat	Measures level of perceived threat and the level of hyper-arousal observed in employees. Threat may be present post incident as well, as in the case of a robber not apprehended and fear of the perpetrator returning due to getting a dye pack. A qualifier: When employees are robbed so often and are "hardened" to threats, even though the incident by nature is threatening to most, it can be rated lower.
9	Media and public knowledge of event	Measures level of internal and external awareness of critical incident. Will need to research news sources and query company contacts further in order to properly score this index.

Appendix F

Critical Incident Severity Index Scale (CrISIS) Scoring Key – Part 2

	Index	Value=0	Value=1	Value=2	Value=3	Value=4	Value=5
1	Employees Directly and indirectly impacted	None	≤ 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
2	Extent of Violence	None	Verbal attack	Verbal, attack with weapon implied	Physical attack	Physical attack with weapon shown	Physical attack with weapon
3	Extent of Injury	None	Minimal injuries with no medical care	Minor injuries with brief medical care	Injury with more medical care	Serious injury or disability	Serious injury with extensive medical care
4	Shared History of Trauma	None	More than 5 years	3-5 years	1-2 years	6-12 months	Less than 6 months
5	Impact on Productivity	None	Minimal time away from work duties	Time away from work is less than ½ day	Time away from work is less than 1 day	Time away from work is 1-2 days	Time away from work is 3 or more days
6	Level of exposure to critical incident	N/A	Occurred off site and not witnessed	Witnessed off site	Occurred on-site but not witnessed.	Witnessed onsite	Employees involved on onsite
7	Advanced knowledge	None	Very little notice	Some anticipation	Planned with notice	Less notice	Completely unexpected
8	Threat	None	Only vague possibility perceived	Some perceived with beginning arousal	Definite perception of risk and hyper-arousal	Preoccupation with risk and hyper-arousal	Overwhelmed by threat and severely symptomatic
9	Media involvement	None	Department or small group awareness only	Site-wide attention	Local media attention	State media attention	National media attention

Appendix G

Incident Severity: CrISIS Scale Aggregate Scores: 2006 - 2008

Aggregate Score	# Incidents	%	Cumulative %	Aggregate Score	# Incidents	%	Cumulative %
1	73	1.4%	1.4%	24	320	6.2%	77.8%
2	8	0.2%	1.6%	25	272	5.2%	83.0%
3	8	0.2%	1.7%	26	247	4.8%	87.8%
4	5	0.1%	1.8%	27	179	3.5%	91.3%
5	8	0.2%	2.0%	28	163	3.1%	3.1%
6	13	0.3%	2.2%	29	111	2.1%	5.3%
7	51	1.0%	3.2%	30	59	1.1%	6.4%
8	31	0.6%	3.8%	31	38	0.7%	7.2%
9	22	0.4%	4.2%	32	33	0.6%	7.8%
10	31	0.6%	4.8%	33	21	0.4%	8.2%
11	46	0.9%	5.7%	34	15	0.3%	8.5%
12	116	2.2%	8.0%	35	7	0.1%	8.6%
13	156	3.0%	11.0%	36	2	0.0%	8.7%
14	239	4.6%	15.6%	37	3	0.1%	8.7%
15	246	4.7%	20.3%	38	1	0.0%	8.7%
16	196	3.8%	24.1%	39	0	0.0%	8.7%
17	309	6.0%	30.1%	40	0	0.0%	8.7%
18	297	5.7%	35.8%	41	0	0.0%	8.7%
19	325	6.3%	42.1%	42	0	0.0%	8.7%
20	371	7.2%	49.2%	43	0	0.0%	8.7%
21	396	7.6%	56.9%	44	0	0.0%	8.7%
22	353	6.8%	63.7%	45	0	0.0%	8.7%
23	410	7.9%	71.6%	**Total**	**5181**	**100%**	

Appendix H: Data Collection Procedures

Region

During intake, staff records the region based on preset groupings of states as follows.

Region	**States Included**
Northeast	Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont
South	Alabama, Arkansas, District of Columbia, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia
Midwest	Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin
West	Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming
Canada	Canada
Us Virgin Islands	US Virgin Islands
Puerto Rico	Puerto Rico
International	Other International

Type of Industry

Industry categories used derive from on a national industry classification system (NAISC, 2007). The intake staff codes the type of industry as follows (categorical):

Industry	**Code**	**Industry**	**Code**
Accommodation and Food Services	72	Manufacturing	31
Administrative, Support	56	Mining	21
Agriculture, Forestry, Fishing, and Hunting	11	Other	81
Arts, Entertainment and Recreation	71	Professional, Scientific	54
Construction	23	Public Administration	92
Educational Services	61	Real Estate, Rental, Leasing	53
Finance and Insurance	52	Retail Trade	44
Health Care and Social Assistance	62	Transportation, Warehousing	48
Information	51	Utilities	22
Management & Consulting	55	Wholesale Trade	42

Type and Subtype of Incident

The intake staff codes the incident type and sub-type as follows (categorical):

Incident Types and Subtypes	Code
Accident	**AC**
Accidental Fire	12
Injury	11
Motor Vehicle Accident	10
Other Accident	13
Criminal Act	**CR**
Abuse/Neglect	15
Arson	16
Assault	14
Other Criminal Act	18
Robbery	1
Threat of Violence	17
Death	**DE**
Accidental Death	3
Homicide	7
Natural Death	2
Suicide	4
Industrial Disaster	**ID**
Biochemical Disaster	26
Electrocution	27
Explosion	25
Industrial Fire	24
Other Industrial Disaster	28

Incident Types and Subtypes	Code
Illness	**IL**
Illness - Other	22
Terminal illness	23
Natural Disaster	**ND**
Earthquake	33
Natural Fire	29
Flood	30
Hurricane	31, 43, 44, 45
Other Natural Disaster	34
Tornado	32
Organization Issue	**OI**
Reduction in Force	5
Reorganization	21
Site Closing	20
Termination	19
Employee Support	**OI-ES**
Other Employee Support	36
Individual sessions	41
Conflict Resolution	38
Job-Related Stress	42
Multiple Stressors	37
Peer Impact	39
Terrorism	**TA**
Terrorist Act	35

Prior Workgroup Trauma

"Has the same group of employees experienced any other traumatic events in the past 12 months?"

No Prior Workgroup Trauma
Prior Workgroup Trauma
Unknown

Follow-Up Services Completion

Unit staff attempt to follow up with site observers post service to offer additional services and collect outcomes data. They record the outcome of follow up as one of the following.

Completed
Not Completed

On-Site Services Acceptance

During initial call to the intake staff, staff also offers on-site support for the incident and records the response.

On-Site Services Accepted
On-Site Services Declined

Helpfulness of Services for Employees

“How helpful were on-site services to employees?” Optional answers (ordinal) include:

Very helpful
Helpful
Somewhat helpful
Not very helpful
Not helpful
N/A
Unsure

Helpfulness of Services for Management

“How helpful were on-site services to management?”

Very helpful
Helpful
Somewhat helpful
Not very helpful
Not helpful
N/A
Unsure

Participant Observer’s Satisfaction Organizational Response

“How satisfied are you with your organization’s response to this event? Please comment on the reason if poor or unacceptable”.

Excellent response
Very good response
Satisfactory response
Poor response
Unacceptable response
Not asked

Subsequent Workgroup Trauma

“Since the original event, have these employees experienced any other traumatic events?

Subsequent Workgroup Trauma
No Subsequent Workgroup Trauma
Unknown

Restoration of Employee Performance

"Would you agree or disagree that these employees have returned to the same level of functioning as before the critical incident?"

Strongly agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree
N/A
Unsure

Employee Resignations

"Have any employees resigned because of the critical incident?"

Resignation
Return to Work
Unknown

Employee Transfers

"Have any employees transferred because of the critical incident?"

Transfer
Return to Work
Unknown

Extended Leaves/Employee Absences

Have all other employees returned to work? Optional answers (binary, categorical variable):

Extended Leave
Return to Work
Unknown

Workgroup Atmosphere

"Sometimes change occurs following a crisis. I would like to ask you about common changes employees may experience. Please tell me if you have noticed a change, whether positive or negative, in the employees affected by this event in the following ways: Interaction with coworkers? Interaction with management? Morale?

Generally positive at the group level
Specifically positive at the individual level
No change
Generally negative at the group level
Specifically negative at the individual level
Not applicable

Employee Symptoms

"Sometimes change occurs following a crisis. I would like to ask you about common changes employees may experience. Please tell me if you have noticed a change, whether positive or negative, in the employees affected by this event in the following ways: Irritability or Anger? Anxiety? Sadness? Concentration? Startle Response? Avoidance of Reminders? Hyperawareness of Surroundings? Ability to Perform Routine Functions?

Generally positive at the group level
Specifically positive at the individual level
No change
Generally negative at the group level
Specifically negative at the individual level
Not applicable

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