

Summer 8-2016

Trauma Exposure and Health Outcomes in College Students: The Mediating Role of Experiential Avoidance

Kathryn L. Sowder

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TRAUMA EXPOSURE AND HEALTH OUTCOMES IN COLLEGE STUDENTS:
THE MEDIATING ROLE OF EXPERIENTIAL AVOIDANCE

A Dissertation

Submitted to the School of Graduate Studies and Research

in Partial Fulfillment of the

Requirements for the Degree

Doctor of Psychology

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August 2016

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The question of how trauma affects health is highly salient, given the alarming prevalence of trauma in the United States. The negative impact of trauma on mental health has been well documented, and a growing body of literature establishes robust relations between trauma and adverse physical health outcomes. In the present study, experiential avoidance (EA) was examined as a potential mediator of trauma and physical health outcomes in college students. EA is the process that occurs when an individual is unwilling to access unwanted private events (e.g., thoughts, emotions, and sensations), and makes attempts to control their form or frequency even when doing so is unnecessary or causes harm. Undergraduate college students at a university in Western Pennsylvania with a history of trauma exposure were invited to complete several questionnaires regarding trauma exposure and emotional reactions, other stressful life events, EA, health behaviors, physical health outcomes, and basic demographic information. Data were analyzed with regression and bootstrap methods to evaluate the hypothesized relations between trauma, EA, and health outcomes. Results indicate that, consistent with past research, frequency of trauma exposure, severity of PTSD symptoms, and EA relate to poorer health outcomes. However, EA did not significantly mediate the relation between trauma and health outcomes when controlling for recent life experiences, whether or not PTSD symptoms were also controlled. Possible explanations of these findings and suggestions for future research are discussed.

TABLE OF CONTENTS

Chapter		Page
ONE	INTRODUCTION.....	1
TWO	REVIEW OF LITERATURE.....	4
	Trauma and Health Outcomes	4
	Pain	4
	Gastrointestinal Disorders	10
	Cardiovascular Disease	14
	Obesity.....	18
	Pathways Linking Trauma and Health Outcomes	21
	Biological Pathway.....	21
	Psychological Pathway	28
	Behavioral Pathway.....	32
	Experiential Avoidance	37
THREE	THE PRESENT STUDY.....	47
FOUR	METHOD	49
	Participants	49
	Measures.....	50
	Demographics.....	50
	Trauma Exposure.....	50
	Traumatic Life Events Questionnaire.....	50
	PTSD Symptoms	52
	PTSD Checklist-Civilian Version	52
	Recent Life Experiences.....	53
	Inventory of College Students' Recent Life Experiences	53
	Experiential Avoidance	54
	Acceptance and Action Questionnaire-II	54
	Overall Health	54
	RAND 36-Item Short Form Health Survey.....	54
	Physical Health Symptoms and Conditions	55
	Health Behaviors	57
	National College Health Risk Behavior Survey.....	57
	Smoking.....	57
	Illicit Substance Use	58
	Sexual Behavior.....	58
	Diet	58
	Exercise	58
	Alcohol Use Disorders Identification Test	59

Chapter		Page
	Body Mass Index	60
	Procedures	60
	Data Analyses	61
FIVE	RESULTS	64
	Preliminary Analyses	64
	Missing Data	64
	Multivariate Assumptions	64
	Descriptive Analyses	65
	Trauma Exposure	65
	Medical Conditions	65
	Multiple Regression Analyses	67
	Bootstrapping Analyses	72
	Exploratory Analyses	73
SIX	DISCUSSION	76
	Limitations	83
	Implications of Findings	84
	Suggestions for Future Research	85
	REFERENCES	87
	APPENDICES	108
	Appendix A – Traumatic Life Events Questionnaire	108
	Appendix B – PTSD Checklist – Civilian Version	112
	Appendix C – Inventory of College Students’ Recent Life Experiences	113
	Appendix D – Acceptance and Action Questionnaire-II	115
	Appendix E – RAND 36-Item Short Form Health Survey	116
	Appendix F – Physical Health Symptoms and Conditions	118
	Appendix G – National College Health Risk Behavior Survey	122
	Appendix H – Alcohol Use Disorders Identification Test	128
	Appendix I – Demographics Questionnaire	131
	Appendix J – Informed Consent Form	134
	Appendix K – Debriefing Form	136

LIST OF TABLES

Table	Page
1	Zero-Order Correlations of All Scales 66
2	Frequency and Percentage of Participants Reporting Each Event on the TLEQ 67
3	Frequency and Percentage of Participants Reporting Medical Conditions..... 68
4	Relation of Frequency of Trauma Exposure to Health Outcomes 69
5	Relation of PTSD Symptom Severity to Health Outcomes..... 70
6	Relation of EA to Health Outcomes 72
7	Means and Standard Deviations for Interpersonal vs. Non-Interpersonal Trauma Groups 74

LIST OF FIGURES

Figure		Page
1	Hypothesized mediation model	48

CHAPTER ONE

INTRODUCTION

The question of how trauma influences health is relevant and important, given the alarming prevalence of exposure to trauma in the United States. Prevalence rates vary, but the most systematic and comprehensive nationally representative study to date indicated that at least 50% of women and 60% of men in the general population report exposure to one or more traumatic events (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). A more recent replication of this groundbreaking study placed estimates at over 80% (Sledjeski, Speisman, & Dierker, 2008). The most common traumatic events reported in Kessler and colleagues' study were witnessing someone being badly injured or killed; being involved in a fire, flood, or natural disaster; and being involved in a life-threatening accident. In addition to acute trauma or single incidences of exposure, chronic trauma exposure is highly frequent in U.S. society. Exposure to childhood adversity, including sexual abuse, physical abuse, or neglect, is estimated at nearly 20% (Finkelhor, 2009). Further, an overwhelming majority of individuals (65%-93%) exposed to one type of childhood adversity are exposed to multiple types (Felitti et al., 1998).

The negative impact of traumatic events on mental health has been well documented (e.g., Breslau et al., 1998; Fledderus, Bohlmeijer, & Pieterse, 2010; Galea et al., 2002; Kessler et al., 2010; Kessler et al., 1995). Further, a growing body of literature establishes robust relations between trauma and adverse physical health outcomes. Adult trauma survivors report more physical symptoms, perceive their overall health as poorer, and report lower health-related quality of life compared to adults without trauma exposure (Edwards, Anda, Felitti, & Dube, 2004; Gómez-Pérez & López-Martínez, 2013; Springer, 2007; Ullman & Siegel, 1996). Significantly higher annual health care costs and greater health care utilization, including primary care, emergency department, hospital outpatient, and specialty

TRAUMA EXPOSURE AND HEALTH

clinic visits, are observed among persons with trauma histories (Arnow, 2000; Bonomi et al., 2008; Chartier, 2010; Fergusson, McLeod, & Horwood, 2013). Trauma has been related to a wide variety of diseases and conditions, including chronic pain, cancer, stroke, diabetes, hepatitis, ischemic heart disease, chronic bronchitis, and emphysema (Felitti et al., 1998; Irish, Kobayashi, & Delahanty, 2010; Kendall-Tackett & Marshall, 1999; Wegman & Stetler, 2009). Further, dose-response relations are repeatedly observed: the greater the number and severity of traumatic events, the more unfavorable the health outcomes (Felitti et al., 1998; Scott-Storey, 2011; Sledjeski et al., 2008). The negative health effects of trauma are fairly well established. What are not yet known are the mechanisms by which these outcomes occur. Answers have important prevention and treatment implications for public health.

Three primary pathways have been hypothesized as contributing to the relation between trauma and physical health (Friedman & Schnurr, 1995; Schnurr & Green, 2004). First, the biological pathway largely implicates severe or overwhelming stress and subsequent dysregulations in central stress response systems. Traumatic experiences have been linked to heightened neuroendocrine stress reactivity and suppressed immune functioning, which may lead to health problems (Hulme, 2011; Kendall-Tackett, 2009; Neigh, Gillespie, & Nemeroff, 2009). Second, the psychological pathway relates psychiatric problems to increased risk for poor health. Psychiatric disorders are consistently observed at higher rates among trauma-exposed individuals (Kessler et al., 2010), and research connects many of these disorders and associated problems to illness and other negative health outcomes. Third, the behavioral pathway suggests that health risk behaviors are largely responsible for the relations between trauma and health. Individuals exposed to trauma are found to exhibit higher rates of health risk behaviors that may contribute to poor health, such as increased use of alcohol and other drugs, driving while intoxicated, early onset of smoking, decreased physical activity, obesity, and risky sexual behavior (Davis, Combs-

Lane, & Smith, 2004). Many of these behaviors are related to the leading causes of morbidity and mortality in the United States (Eaton et al., 2012).

Although factors among the biological, psychological, and behavioral pathways have been proposed, further research is needed to identify mediating variables in order to form a more complete understanding of the relations between traumatic experiences and adverse health outcomes. In the present study, experiential avoidance (EA), defined most explicitly in the Acceptance and Commitment Therapy (ACT) model, is proposed as one such factor. EA is the process that ensues when an individual is resistant to accessing unwanted private events (e.g., emotions, thoughts, sensations), and makes attempts to control their form, frequency, or situational sensitivity, even when doing so is unnecessary or causes harm (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Because of the distressing nature of trauma and post-traumatic reactions, individuals may engage in EA in an attempt to reduce painful internal states. However, private events are unresponsive to and frequently increase as a result of deliberate control efforts. Behavioral repertoires narrow as individuals expend great effort avoiding unwanted internal experiences, and behavior in the service of a meaningful life decreases. EA can effectively reduce some discomfort in the short-term, but can have negative long-term effects (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996).

Indeed, higher levels of EA are related to greater general psychological symptoms, depression, anxiety, trauma, decreased functioning, and a lower quality of life (e.g., Hayes et al., 2004; Kashdan, Barrios, Forsyth, & Steger, 2006; Tull, Gratz, Salters, & Roemer, 2004). Further, traumatic exposure has been associated with greater EA and poorer psychological and behavioral outcomes (e.g., Batten, Follette, & Aban, 2002; Gratz, Bornova, Delany-Brumsey, Nick, & Lejuez, 2007; Marx & Sloan, 2002; Palm & Follette, 2011). The present study investigated experiential avoidance as a mediator of traumatic event exposure and health outcomes in a sample of male and female undergraduate students.

CHAPTER TWO

REVIEW OF LITERATURE

Trauma and Health Outcomes

Pain

Pain is perhaps the most widely studied physical health outcome in the trauma literature. Researchers from a variety of medical specialties have discerned that a large proportion of their patients who have chronic pain also report a history of childhood abuse (Kendall-Tackett, 2001). Data from epidemiological studies lend further support to a relation, illustrating that pain-related conditions are more common in individuals with a history of childhood abuse than in those without a history of childhood abuse.

In a series of meta-analyses, several relations between retrospective reports of childhood sexual abuse (CSA), childhood physical abuse (CPA), or neglect, and the experience of chronic pain in adulthood were found (Davis, 2005). First, individuals with a history of abuse or neglect in childhood reported more pain symptoms in adulthood than did individuals with no history of abuse or neglect (mean effect size $[ES] = 0.41$). Second, patients with chronic pain were more likely to report histories of abuse or neglect in childhood compared to healthy controls (mean $ES = 0.22$). Third, patients with chronic pain who sought treatment were more likely to report histories of abuse or neglect than were non-patients who reported chronic pain but did not seek treatment (mean $ES = 0.15$). Fourth, in population-derived samples, individuals who reported pain were more likely to report histories of abuse or neglect in childhood than were those who did not report pain (mean $ES = 0.12$). Together, results support a modest relation between retrospective reports of abuse or neglect in childhood and chronic pain in adulthood. In another meta-analysis examining only CSA, a significant association was found between CSA and a lifetime diagnosis of nonspecific chronic pain and chronic pelvic pain (Paras et al., 2009). Conversely, no

TRAUMA EXPOSURE AND HEALTH

significant association was found between CSA and a lifetime diagnosis of fibromyalgia or headache.

In the examination of headache, specifically, several other studies do, in fact, reveal an association between childhood trauma and specific types of headache. Peterlin, Ward, Lidicker, and Levin (2007) investigated the frequency of CSA or CPA in headache patients. At an outpatient headache clinic, charts of 161 patients were reviewed for headache diagnosis and history of self-reported abuse. A significantly higher percentage of patients with chronic daily headache diagnoses reported CSA and/or CPA (40.0%) compared to patients with migraine diagnoses (27.3%).

Even so, patients with migraine appear to report childhood trauma with high frequency, as well. Tietjen et al. (2010) examined prevalence rates of CPA, CSA, emotional abuse, and neglect specifically in migraine patients. In this large, multicenter study, 1,348 headache clinic patients who were diagnosed with migraine completed surveys assessing abuse. Childhood trauma was reported by 58% of the study population. Emotional abuse and emotional neglect were reported most commonly (38% each). Moreover, 74% of those reporting emotional abuse also reported emotional neglect, indicating that these two types of maltreatment, in particular, co-occur at high rates. Those who recounted CSA (25%) and CPA (21%) commonly reported the co-occurrence of emotional abuse (61% for CSA; 80% for CPA) and emotional neglect (62% for CSA; 78% for CPA). Forms of childhood maltreatment appear to rarely occur in isolation. Of the 58% who reported some type of childhood maltreatment, 40% reported experiencing at least two types of maltreatment.

Of note, far more women (88%) than men (12%) were included in this study (Tietjen et al., 2010), perhaps due to the significantly greater proportion of women diagnosed with migraine, which is up to three times more common in adult women than men (Merikangas, 2013). Women are also more likely to experience childhood sexual and emotional abuse and

TRAUMA EXPOSURE AND HEALTH

are more likely to report a greater number of different types of abuse (Tietjen & Peterlin, 2011). Tietjen and colleagues theorized that although hormones likely have a substantive role in sex differences in migraine prevalence rates, childhood maltreatment might also play a role.

Because different types of childhood maltreatment appear to more commonly occur together rather than alone, combined effects are important to consider. Arnow, Hart, Hayward, Dea, and Taylor (2000) examined the potentially additive effects of CSA and CPA. Participants were members of Kaiser Permanente, a large health maintenance organization (HMO) in California. Two groups who reported CSA histories and psychological distress were compared: those with and without CPA histories. Medical service utilization and medical complaints associated with visits were gathered from the HMO electronic database, providing objective measures of physical health status. Those who reported both CSA and CPA made significantly more visits to the emergency room (ER) for both chronic and acute pain than those who reported CSA only. Furthermore, migraine and non-migraine headaches were the most common diagnoses at these ER visits. Thirty-three percent of participants with both CSA and CPA histories were physician-diagnosed with headache on at least one ER visit, compared to 3% of CSA-only participants. In addition to higher ER utilization, individuals with both CSA and CPA histories exhibited significantly greater non-psychiatric outpatient utilization for chronic pain complaints compared to CSA-only individuals. Results indicate that sexual and physical abuse show additive effects. Among a group of individuals who were psychologically distressed and reported CSA histories, those who additionally reported CPA histories comprise a discrete subgroup, characterized by higher pain complaints associated with both outpatient service and ER visits, as well as greater frequency of ER visits specifically for headaches.

TRAUMA EXPOSURE AND HEALTH

Studies such as those previously described that document abuse in clinical populations are worthwhile, but the established relations between medical utilization and self-reported abuse may conflate results (Raphael, 2004). Treatment-seeking abuse victims may not be representative of abuse victims in the general population; therefore, it is important to supplement these studies with epidemiological data. In one such study, Goodwin, Hoven, Murison, and Hotopf (2003) found that 15.8% of 3,032 participants in a nationally representative sample reported CPA. Those reporting frequent CPA were significantly more likely to report migraine (odds ratio [OR] = 2.7), even after adjusting for sociodemographic factors and psychological disorder.

In another nationwide epidemiological study, 10.6% of 5,877 men and women aged 15-54 years reported histories of CPA and/or CSA (Sachs-Ericsson, Kendall-Tackett, & Hernandez, 2007). Those who reported childhood abuse were significantly more likely to report a health problem in the past year than those who reported no childhood abuse (37.0% vs. 22.5%). Among participants who reported a significant medical problem ($n = 1,727$), those who reported an abuse history had, on average, significantly more medical problems than participants who reported no abuse history. Controlling for the number and type of medical problems, childhood abuse was associated with significantly greater self-reported pain. Because depression has been shown to relate independently to both abuse and to pain, depression was controlled to determine if the relation would continue to hold. Although depressed individuals did indeed report more pain than nondepressed individuals, the relation between abuse and pain remained significant after controlling for depression. Therefore, childhood abuse appears to relate to greater pain in individuals with medical conditions, independent of the effects of depression.

Findings from other large epidemiological studies have similarly lent support to the premise that pain is more common in abuse survivors. Chronic pain, painful gynecologic and

TRAUMA EXPOSURE AND HEALTH

gastrointestinal problems, headaches, arthritis, chronic pelvic pain, fibromyalgia, facial pain, back pain, chronic fatigue syndrome, unexplained chest pain, and tender-point pain all have been found to occur with greater frequency among those who report histories of childhood maltreatment than those who report no history of childhood maltreatment (Brown, Berenson, & Cohen, 2005; Eslick, 2011; Golding, 1994, 1999; Gonzalez et al., 2012; Goodwin et al., 2003; McBeth, 1999; Romans, Belaise, Martin, Morris, & Raffi, 2002; Walsh, 2007).

The vast majority of studies to date, including those previously described, have employed case-control or cross-sectional designs, in which pain patients are compared to non-pain patients, or abused participants are compared to non-abused participants. These studies yield important information, but they are subject to confounding factors. Abuse is related to an array of lifestyle factors, including socioeconomic (SES) status, income, parental education level, and parental substance abuse, among others. Therefore, it is possible that abuse serves as a correlate for pain symptoms and conditions, rather than as a causal factor. Prospective designs offer the advantage of measuring abuse first, and then following participants over time to help clarify the relation between abuse and the development of pain. Although prospective designs are rare in this type of research, they are beginning to emerge.

In one study employing such a design, participants were 422 females, 35-45 years old, randomly selected from three communities in Sweden (Linton, 2002). At baseline, the women reported either no pain ($n = 194$) or some pain ($n = 228$). At one-year follow-up, 419 women completed questionnaires assessing musculoskeletal pain and disability. For the no-pain group, CPA significantly increased the risk of developing back pain one year later ($OR = 2.65$), and both CSA and CPA increased the risk for problems in functioning due to pain. On the other hand, for the pain group, neither worsening pain nor decreased functioning one year later was significantly related to abuse. The results for the no-pain group, particularly given the prospective design, give credence to the hypothesis that childhood abuse is related to

TRAUMA EXPOSURE AND HEALTH

future development of pain or pain-related problems in functioning. However, the results for the pain group suggest that abuse may affect the initial onset of pain, but not its progression. On the other hand, methodological issues could have contributed to the nonsignificant findings for the pain group. In particular, one year may not have been long enough to detect significant changes in pain or functioning for those who already reported spinal pain.

In another prospective study spanning a significantly longer time period, participants were identified and selected in childhood and interviewed 20 and 30 years later to examine long-term consequences of abuse (Raphael, 2001, 2011). Initially, court-substantiated cases of abuse and neglect were identified. A control group was established by matching child participants with non-abused and non-neglected counterparts on the basis of age, sex, race, and approximate family social class. Among the sample of 1,575 participants, 1,196 (73%) of participants, now in young adulthood ($M = 29.1$ years), were located and interviewed at 20-year follow-up (Raphael, 2001). Results revealed no significant relation between early CSA, CPA, or neglect, and pain complaints. However, a different pattern emerged for participants in middle adulthood. Of the 1,196 participants interviewed in young adulthood, 807 (67%) were interviewed at 30-year follow-up, at a mean age of 41.2 years (Raphael, 2011). Any form of childhood victimization significantly predicted pain complaints, including the number of pain symptoms, the number of pain problems leading to care seeking or activity interference, and the number of pain symptoms attributed to illness or injury, though the relations were very modest (i.e., 1% of variability due to childhood abuse or neglect). However, a significant and robust pattern emerged when the combined effects of childhood victimization and lifetime posttraumatic stress disorder (PTSD) were examined. Participants with a combination of any type of childhood victimization and lifetime PTSD reported a marked increase in number of pain symptoms, pain problems, and pain attributed to illness or injury compared to those without this combined history. In a supplementary reanalysis of the

TRAUMA EXPOSURE AND HEALTH

young adulthood sample, similar findings emerged, in which the combination of childhood abuse or neglect and lifetime PTSD robustly predicted pain symptoms. These results suggest that the reaction to traumatic events may be equally or more important than mere exposure.

Two prospective studies examined adverse or traumatic childhood events and adult-onset arthritis. In a large, cross-national sample, Von Korff et al. (2009) found that participants who reported two or more childhood adversities were at significantly increased risk of developing adult-onset arthritis compared to those reporting one or no childhood adversities, controlling for age, sex, and country. Those reporting three or more childhood adversities were at still higher risk. The relations held even after controlling for current mood and anxiety disorders and early-onset psychological disorder. Similar findings were revealed in a large sample of Canadian men and women (Kopec & Sayre, 2004). Participants who reported two or more childhood traumatic events were more likely to have been diagnosed with arthritis at four-year follow-up than those who reported no traumatic events. Findings from both studies reveal a dose-response relation between number of traumatic events and arthritis.

In sum, the literature relating trauma, specifically childhood maltreatment, to pain is large and diverse. Adult survivors of childhood abuse or neglect have more symptoms of pain, decreased pain-related functioning, and greater pain-related conditions, including chronic pain, headache, fibromyalgia, gynecological and gastrointestinal pain, arthritis and musculoskeletal pain. These associations hold in both clinical and community samples, with self-reported or court-substantiated abuse, with self-reported or physician-diagnosed symptoms or conditions, and in both retrospective and prospective designs.

Gastrointestinal Disorders

Functional gastrointestinal disorders (FGIDs) include chronic or recurrent gastrointestinal symptoms that are not explained by structural or organic abnormalities. These

TRAUMA EXPOSURE AND HEALTH

disorders are among the most common medical disorders seen in primary care clinics and gastroenterology specialty clinics (Leserman & Drossman, 2007). Irritable bowel syndrome (IBS) is the most common FGID, with prevalence estimates in the range of 5-26% in the general population. Other common FGIDs include functional dyspepsia and chronic constipation. Health-related quality of life has been found to be lower in persons with FGIDs than healthy controls, and similar to that in persons with other chronic diseases, such as diabetes or end-stage renal disease. A variety of psychosocial stressors have been shown to precede the onset of FGIDs or exacerbate current symptoms. Childhood trauma, predominantly childhood abuse or neglect, has been implicated in these disorders, particularly in IBS. In a recent position statement on IBS by the American Gastroenterology Association (2002), childhood abuse, among other psychosocial factors, was identified as strongly influencing clinical outcomes.

In a landmark study, Drossman (1990) surveyed 206 female patients of a university-based gastroenterology clinic after noting that a high frequency of his own patients in this clinic reported some type of abuse history. Forty-four percent of the participants reported physical or sexual abuse in childhood or adulthood. The risk for abuse, in particular frequent physical abuse, was greater for patients with FGIDs ($OR = 11.39$) than for those with organic gastrointestinal disorders. Of the organic diseases, Crohn's disease and peptic disease co-occurred with abuse most often. Regardless if problems were functional or organic, patients who reported abuse had a fourfold greater risk for pelvic pain, were more likely to report non-abdominal symptoms, and had more lifetime surgery than did patients who denied abuse. In addition, there was a trend for abused patients to see their physicians more often. Notably, gastroenterologists who were seeing these patients were aware of abuse in only 17% of cases. A history of abuse appears to be a common, but invisible, experience among patients in a gastroenterology clinic and may lead to adverse health consequences.

TRAUMA EXPOSURE AND HEALTH

Clinicians have additionally noted that patients with FGIDs appear to have high rates of psychiatric disorders. In a population-based study, Koloski, Talley, and Boyce (2005) examined psychosocial factors, including psychiatric disorders, related to abuse and FGIDs. Three hundred and seven participants aged 18 years and over met criteria for IBS or functional dyspepsia based on structured interviews. The majority of participants who met criteria for one or both of these disorders were female, consistent with evidence suggesting that these disorders are more common in women than men. To parallel gender differences in the GI disordered group, 30 males and 70 females were randomly selected to comprise the healthy control group. A computerized structured interview was utilized to assess present and past depression, anxiety, and somatization diagnoses. Standardized self-report questionnaires were additionally collected to assess other psychosocial variables.

Unlike previous studies, results revealed that rates of childhood abuse were not significantly different for those with FGIDs than for healthy controls (Koloski et al., 2005). Even so, CSA, CPA, or emotional/verbal abuse in childhood was common for those with IBS (52.9%) and for those with functional dyspepsia (66.7%). On the other hand, abuse in adulthood, particularly physical and/or emotional/verbal abuse, was significantly more common for those with IBS, functional dyspepsia, and IBS and functional dyspepsia compared to controls. Although there were no significant differences between groups in rates of anxiety or somatization disorders, depressive disorders were significantly more common in abused participants with IBS and/or functional dyspepsia. Further, abused participants with IBS and/or functional dyspepsia were significantly more neurotic, and more likely to have an external locus of control, compared to non-abused participants. Abused persons also reported perceiving less care in interpersonal relationships, being less satisfied with levels of social support, and using more ineffectual coping styles. Finally, higher levels of depression, a self-controlling style of coping with a stressor (i.e., attempts to regulate one's feelings and

actions), and being female were independent predictors of reporting a history of abuse in participants with FGIDs. Self-controlling coping is considered an avoidant strategy and can be contrasted with approach strategies considered more adaptive, such as seeking social support or planful problem solving. Findings highlight the importance of examining more proximal stressors, such as abuse in adulthood. Moreover, results indicate that the relation between abuse, IBS, and functional dyspepsia may be largely explained by psychological factors. Further mediation analyses are needed to examine potential mechanisms.

Using a prospective study design, van Tilburg et al. (2010) followed children who were at risk for abuse and neglect from childhood into early adolescence. Data on gastrointestinal symptoms were gathered from surveys completed by caregivers when children were 4, 6, 8, and 12 years old and self-reports from the youth at 12 years old. Data on childhood maltreatment, including emotional abuse, sexual abuse, physical abuse, or neglect, were derived from allegations reported to Child Protective Services (CPS). In addition, at 12 years, youth were asked to retrospectively report abuse. Findings indicated that maltreated youth were more likely to experience unexplained gastrointestinal symptoms than non-maltreated youth. Self-reports of all types of childhood abuse were significantly associated with both abdominal pain and nausea/vomiting. In contrast to self-reports, CPS-recorded sexual abuse, but not other types of maltreatment, was significantly associated with abdominal pain, but not with nausea/vomiting. Moreover, sexual abuse allegations were significantly more likely to precede or coincide with abdominal pain than to follow it, suggesting that this type of pain may, in fact, be a consequence of childhood abuse. Psychological distress (i.e., anxiety or depression) was revealed to significantly mediate this relation. It is possible that the disparate findings for self-report compared to CPS-recorded abuse reflect the fact that many children who are maltreated are not reported to CPS (Theodore et al., 2005). When classifying children based on CPS data, maltreated children

TRAUMA EXPOSURE AND HEALTH

are likely to be misclassified, attenuating the relation between abuse and gastrointestinal symptoms. It is also possible that sexual abuse is a particularly potent contributor to poor health status.

Results from other studies have provided similar support for the relation between trauma and gastrointestinal symptoms. In addition to gastrointestinal disorder diagnoses, recurring stomach problems, nausea, heartburn, chronic pelvic pain, and ulcer have been found to occur with significantly greater frequency in persons with abuse or neglect histories (Goodwin et al., 2003; Heitkemper, Cain, Burr, Jun, & Jarrett, 2011; Randolph & Reddy, 2006; Ross, 2005).

Cardiovascular Disease

Cardiovascular disease is the leading cause of death in the United States. Approximately 600,000 people die of heart disease each year, equating to one in every four deaths (Centers for Disease Control and Prevention, 2013). Established risk factors include the male sex, dyslipidemia, hypertension, diabetes mellitus, and smoking, and underlying causes include lifestyle factors such as poor dietary habits, inadequate physical activity, and obesity (Mozaffarian, Wilson, & Kannel, 2008). Although these proximal risk factors are well established, emerging research is underscoring the importance of more distal risk factors, such as early family environments, in the development of cardiovascular disease.

Several large, population-based studies examined cardiovascular events in those with histories of childhood abuse. Reports from the Adverse Childhood Experiences (ACE) Study linked childhood abuse, neglect, and household dysfunction to ischemic heart disease (IHD; Dong et al., 2004). This study, a collaboration between Kaiser Permanente's Health Appraisal Center in San Diego, California, and the Centers for Disease Control and Prevention (CDC), included two survey waves among a total of 9,367 female and 7,970 male HMO members. Eleven percent of participants reported a history of IHD. Ten ACEs were

TRAUMA EXPOSURE AND HEALTH

examined, including CPA, CSA, emotional abuse, emotional or physical neglect, and household exposure to substance abuse, mental illness, domestic violence, a criminal household member, or parental marital discord. The likelihood of IHD increased with exposure to any individual ACE, except for parental marital discord. Further, there was a graded relation between number of ACEs and risk of IHD, with every increase in ACE score increasing reports of IHD by 20%. Traditional and psychological risk factors associated with ACEs, including smoking, physical inactivity, severe obesity, depressed affect, and anger, substantially mediated the relation between ACEs and IHD. However, the graded relation between number of ACEs and risk of IHD remained significant even after controlling for these variables, indicating that there may be yet unidentified pathways by which ACEs affect IHD risk.

Data from the National Comorbidity Survey provide further support for the association between trauma and cardiovascular disease. In this nationally representative sample, 5,308 men and women aged 15 to 54 years were surveyed (Batten, Aslan, Maciejewski, & Mazure, 2004). Women with a history of childhood maltreatment reported a ninefold increase in cardiovascular disorders compared to women reporting no such history, but no significant differences were found for men. However, a history of childhood maltreatment was associated with significantly increased odds of depressive disorders in both women and men. After controlling for depressive disorders, women with a history of childhood maltreatment continued to have significantly higher odds of cardiovascular disorder compared to women reporting no history of childhood maltreatment. In fact, depressive disorders represented no additional risk factor for cardiovascular disorders in women. In the general population, the female sex represents a protective factor for cardiovascular disorders, but this protection may be compromised after the experience of childhood maltreatment and does not appear to be mediated by depressive disorders.

TRAUMA EXPOSURE AND HEALTH

However, results of another large, population-based study provided contradictory results regarding sex differences (Fuller-Thomson, Bejan, Hunter, Grundland, & Brennenstuhl, 2012). Data on 5,095 men and 7,768 women derived from the CDC's 2010 Behavioral Risk Surveillance System were analyzed. Only penetrative CSA was examined, with few males (1.3%) or females (2.0%) reporting a history of such abuse in this sample. Nonetheless, for males, penetrative CSA was associated with an almost threefold increase in odds of heart attack ($OR = 2.96$), even after adjusting for age, race, adult SES, health behaviors, social support, mental health, diabetes, and health care use. Moreover, in this sample, the magnitude of this odds ratio for males exceeded that of other more traditional risk factors, such as diabetes ($OR = 2.91$) and smoking ($OR = 1.56$). In females, the association between penetrative CSA and myocardial infarction was not significant. Results of this study may diverge from those of the previous study (Batten et al., 2004) for a couple of reasons. First, the outcome of interest in this study was myocardial infarction, specifically, whereas Batten and colleagues focused on cardiovascular problems, generally. Second, this study focused on penetrative CSA, whereas Batten and colleagues combined different types of sexual abuse (i.e., penetrative CSA and sexual molestation) with physical abuse. In any case, results from this study suggest that females may learn to cope better with the consequences of CSA, perhaps due to greater help-seeking. On the other hand, CSA may lead to particularly negative consequences for men because the experience could potentially emasculate men, especially because these are likely to have been same-sex encounters, as the majority of perpetrators are men (Banyard, Williams, & Siegel, 2004). However, future studies are needed to disentangle sex differences regarding the relation between childhood abuse and cardiovascular disorders in adulthood.

In a prospective study of 23,916 men and women representative of the Finnish population, Korkeila et al. (2010) examined the relation between childhood adversities

TRAUMA EXPOSURE AND HEALTH

different from those examined in previous studies and adulthood coronary heart disease.

Childhood adversities assessed at baseline included long-term financial difficulties, divorce or separation of parents, serious family conflicts, severe illness of a family member, frequent fear of a family member, and alcohol problems of a family member. At follow-up, a mean of 6.9 years after baseline, hospitalization and mortality data were collected. Of all respondents, 61% reported at least one childhood adversity. Risk of ischemic heart or cerebrovascular events was higher for those who reported exposure to childhood adversity compared to those who reported no exposure; this relation was most consistent among women. Risk was increased twofold in women who had experienced financial difficulties, interpersonal conflicts, or longstanding illness of a family member; highest risk was for those exposed to all three of these adversities. In men, risk was increased 1.4-fold only among those who experienced the longstanding illness of a family member. In both men and women, after adjusting for age, fear of a family member was associated with all-cause mortality.

Adjustment for education, health risk behaviors, depression, hypertension, and diabetes attenuated all relations, suggesting that these factors may be serving as partial mediators.

However, like previous studies, results suggest that there are yet unidentified pathways mediating the relation between childhood adversity and adulthood cardiovascular events.

Although results may be confounded with childhood maltreatment, they appear to support a relation between childhood adversities as a whole, not only childhood maltreatment, and adult health outcomes.

One very recent, prospective study examined metabolic syndrome in mid-life women (Midei, Matthews, Chang, & Bromberger, 2013). Metabolic syndrome is an important preclinical syndrome consisting of several metabolic risk factors, including insulin resistance, central adiposity, hypertension, and dyslipidemia. This syndrome predicts the onset of type 2 diabetes, atherosclerosis, and myocardial infarction. Data came from a multisite, community-

TRAUMA EXPOSURE AND HEALTH

based cohort study of women. At baseline assessment, childhood maltreatment, including CSA, CPA, emotional abuse, or neglect, was reported by 34% of the sample. Results indicated that childhood abuse did not predict incident metabolic syndrome at baseline. However, those without metabolic syndrome at baseline who developed the syndrome by follow-up visits were significantly more likely to report CPA when controlling for age and ethnicity. Moreover, even when controlling for depressive symptoms, cigarette smoking, physical activity, alcohol abuse, childhood SES, and adulthood SES, CPA continued to be significantly associated with incident metabolic syndrome. Emotional abuse, CSA, and neglect were not associated with incident metabolic syndrome. It is unclear why CPA predicted metabolic syndrome, whereas CSA, emotional abuse, and neglect did not. One possibility is that the perpetrator of the abuse matters. Two of the five questions assessing CPA implicated a family member, whereas questions for other types of abuse did not. Future studies should include assessment of perpetrators of abuse to examine which characteristics of abuse are most salient for future health outcomes.

Taken together, there appears to be abundant evidence that traumatic and stressful life events are associated with cardiovascular conditions. Trauma has been related to IHD, cardiovascular disease, myocardial infarction, heart attack, and incident metabolic syndrome, above and beyond the effects of established risk factors. Further, the female sex, typically a protective factor, may be compromised by the greater incidence of childhood abuse, particularly CSA, among women.

Obesity

Currently, more than two-thirds of adults and one-third of children and adolescents in the U.S. are overweight or obese (Wang & Beydoun, 2007). With its well-known morbidity and mortality risks, obesity has become a major public health concern. Obesity is a leading preventable cause of disease and death, second only to tobacco use. Understanding

TRAUMA EXPOSURE AND HEALTH

underlying causes and risk factors is critical in fighting this public health crisis.

Environmental factors are considered to play a critical role in shaping people's lifestyles and fueling the obesity epidemic. Therefore, efforts are underway to understand the environmental and psychosocial antecedents that may predispose someone to obesity.

Analyses of data from the ACE study, previously described, revealed that all types of childhood abuse were related to increased weight in adulthood (Williamson, Thompson, Anda, Dietz, & Felitti, 2002). Frequent physical abuse was related to the largest increase in body weight. Risks of $BMI \geq 30$ and $BMI \geq 40$ each increased with higher numbers of severe types of abuse. Estimations revealed that 8% of cases of $BMI \geq 30$ and 17% of cases of $BMI \geq 40$ were due to childhood abuse. Results may be attenuated because adulthood characteristics were adjusted for in this study, including smoking status, physical activity, alcohol consumption, education, employment status, and number of births. Because these factors also occurred after the abuse, it is possible that they were also directly or indirectly influenced by abuse. It is feasible, then, that variables were over-controlled for in this study, and results may reflect a downward bias.

In a cross-national, population-based sample, 696 female and male adult participants completed a questionnaire to identify childhood exposure to traumatic events (Gunstad et al., 2006). Events included physical abuse, sexual abuse, sustained family conflict, wartime activities, parental divorce, and separation from family, among others. Results indicated that for men, when controlling for age, the total number of early life stressors significantly predicted BMI, with those men reporting a greater number of early life stressors exhibiting a greater likelihood of obesity. In women, no relation was found. Examining prevalence rates of different types of early life stressors revealed that bullying, social rejection, and emotional abuse predict BMI in men beyond the effects of age. In a second study, these gender differences were not found (D'Argenio et al., 2009). In this sample, severity of trauma was a

TRAUMA EXPOSURE AND HEALTH

significant predictor of adult obesity for both men and women. Participants in the first study were screened for significant psychiatric conditions, suggesting that this factor does not account for the relation between early life stress and adulthood obesity, at least in men. Likewise, the second study found that trauma remained a significant predictor of obesity after accounting for psychiatric disorder, but in this case, in both men and women. Both studies indicate that psychiatric disorder does not appear to fully, or even significantly, mediate the relation between abuse and obesity.

The majority of research is cross-sectional and correlational in nature, using retrospective reports of childhood abuse, making causal determination difficult. In one recent prospective study, two groups of female participants were followed for 18 years: (a) those who were referred by CPS and had substantiated accounts of familial sexual abuse, and (b) a demographically matched group of non-abused peers (Noll, Zeller, Trickett, & Putnam, 2007). Differential obesity rates between groups were not evident at baseline, when participants were approximately 11 years old. In childhood/early adolescence, 25.42% of the abused women and 21.88% of the non-abused women were obese ($OR = 1.25$). In later adolescence, 27.87% of the abused women and 15.49% of the non-abused women were obese ($OR = 2.03$). By young adulthood, 42.25% of the abused women and 28.40% of the non-abused women were obese ($OR = 2.85$). Therefore, results indicate that obesity rates were not significantly different across groups until young adulthood, at which time abused women were nearly three times more likely to be obese than were non-abused women after controlling for demographic characteristics. Trajectory analyses revealed that abused women acquired body mass at a steeper rate across development than non-abused counterparts. Moreover, BMI growth trajectories for abused women were significantly steeper than those for the general population, as compared to CDC data. On the other hand, trajectories for non-abused women mirrored those of the general population. These results provide the first

TRAUMA EXPOSURE AND HEALTH

prospective evidence that CSA may predispose women to the development and maintenance of obesity in later life.

In a recent meta-analysis examining the association between childhood maltreatment and obesity across the lifespan, 44 data sets were synthesized from 41 peer-reviewed studies, totaling 190,285 participants (Danese & Tan, 2013). Findings indicate that whether maltreatment was assessed through retrospective or prospective report, questionnaire, interview, or substantiated records, childhood maltreatment is significantly associated with obesity. The association held when obesity was measured by self-report or physical examination. Childhood maltreatment was associated with obesity for sexual abuse ($OR = 1.43$), physical abuse ($OR = 1.29$), physical neglect ($OR = 1.29$), and emotional abuse ($OR = 1.24$), but not for emotional neglect. Potential confounding factors were additionally explored. Childhood maltreatment was associated with obesity even when results were adjusted for childhood SES, adult SES, current physical activity, current smoking, and current alcohol intake. Taken together, findings indicate that childhood maltreatment consistently and robustly predicts obesity.

Pathways Linking Trauma and Health Outcomes

Biological pathway

Negative health outcomes and illness related to trauma may be due to dysregulations in key systems involved in the stress response, altered as a consequence of severe or chronic stress. The normal stress response is adaptive, preserving a person's life in the face of danger. The stress response becomes problematic when the stressor is extreme, flooding the system with stress hormones, or chronic, leading to frequent activation of the system that is meant for acute emergencies. Exposure to traumatic events can produce chronic hyperarousal of the stress response system, leading to damage to the brain and other bodily systems and

TRAUMA EXPOSURE AND HEALTH

ultimately resulting in a wide range of adverse health outcomes (Kendall-Tackett, 2000, 2009; Suls, Davidson, & Kaplan, 2010).

The hypothalamic-pituitary-adrenal (HPA) axis is essential to the stress response in humans. The HPA axis is a complex system in the brain that is designed to mediate the stress response (Motze & Hertig, 2004). Stress or fear is registered in the amygdala, which triggers the HPA axis. Once stress is registered, a group of neurons in the hypothalamus releases corticotropin-releasing factor (CRF) that, in turn, activates the sympathetic nervous system and stimulates release of adrenocorticotropin hormone (ACTH) from the anterior pituitary. ACTH then fuels the adrenal cortex to release glucocorticoids, principally cortisol. Cortisol travels through the bloodstream and inhibits growth and reproduction, increases heart rate, suppresses immune function and inflammatory responses, and decreases appetite and gastrointestinal function. In the short-term, these responses are adaptive because they mobilize physiological systems that promote fight or flight and prepare the body to react to the stressor. Under normal circumstances, once the stressor has passed, cortisol acts to attenuate the stress response via negative feedback inhibition on the hypothalamus, suppressing the HPA axis and restoring basal cortisol levels so that the stress response and its effects on the body are contained. However, chronically high levels of glucocorticoids damage the hippocampus (e.g., cell death), impairing feedback mechanisms and prolonging HPA axis activation. Individuals exposed to extreme stress early in life are theorized to acquire pathophysiological changes in the central nervous system, predominantly in the HPA axis, that may increase vulnerability to stress later in life (Neigh et al., 2009).

Increased activity of CRF circuits may be one such neurobiological consequence of extreme stress early in development, signifying HPA axis dysfunction. In one study, CRF reactivity in four groups of women were compared: (a) those with a history of childhood physical and/or sexual abuse without a current major depression diagnosis, (b) those with a

TRAUMA EXPOSURE AND HEALTH

history of childhood physical and/or sexual abuse with a current major depression diagnosis, (c) those with a current major depression diagnosis but without a history of significant early life stress, and (d) a control group of women without a current major depression diagnosis and without a history of significant early life stress (Heim et al., 2000). Of note, participants taking psychotropic medications were screened out of this study, because these medications may affect HPA axis function. Hormone and heart rate data were analyzed following the induction of an acute laboratory stressor. Abused women with and without current major depression exhibited greater ACTH concentrations than non-abused women following the stress-induction task. Abused women with major depression showed the greatest ACTH response, which was more than six times greater than the ACTH response observed in the control group, indicating substantial HPA axis dysfunction. In addition, abused women with current depression exhibited higher cortisol and heart rate responses than all other groups. Results indicate that severe early life stress results in persistent sensitization or hyperactivity of the HPA and autonomic stress response systems. Further, these changes in stress reactivity may relate to increased risk for adulthood psychopathological conditions, such as major depression.

In another study utilizing different methods to measure HPA axis activity, 70 women with chronic pain provided salivary cortisol data over the course of each day for 30 days (Nicolson, Davis, Kruszewski, & Zautra, 2010). As in the study described previously, participants were screened out for current psychotropic medication use. In this sample, participants reported a wide range of childhood maltreatment, with different types of maltreatment commonly co-occurring. Overall severity of childhood maltreatment was found to relate to higher cortisol levels throughout the day. When different types of abuse were examined separately, significant positive correlations were found between cortisol levels and emotional abuse and sexual abuse. Positive but nonsignificant correlations were found

TRAUMA EXPOSURE AND HEALTH

between cortisol levels and physical abuse, emotional neglect, and physical neglect. Further, women reporting greater severity of childhood maltreatment also exhibited more current depressive symptoms and an increased likelihood of ever being diagnosed with PTSD. However, current depressive symptoms and PTSD diagnosis showed no significant association with cortisol levels, ruling out the mediating role of these types of psychopathology on adult cortisol levels. The findings of this study improve the evidence that childhood maltreatment can lead to long-term HPA axis dysfunction, and seem to indicate that abuse, particularly sexual or emotional, is more potent than neglect in terms of neurophysiological changes. This sample consisted entirely of women with chronic pain, and therefore, results may not apply to other populations.

In an integrative review of the neurobiological consequences of childhood sexual abuse in participants, primarily women, with or without current MDD or PTSD and without serious medical problems, Hulme (2011) examined and synthesized results from ten studies that met strict inclusion criteria for analyses. A variety of approaches were used to estimate HPA axis dysfunction, which can be broadly classified into three categories: (a) circulating hormone levels, (b) HPA axis suppression, and (c) HPA axis stimulation. These measurements served as proxies for (a) hormone exposure at the cellular level, (b) sensitivity of the HPA axis to negative feedback, and (c) reactivity of the HPA axis to stress, respectively. Synthesis of results generally demonstrated HPA axis dysfunction in abused participants with either MDD or PTSD, including alterations in circulating hormone levels, negative feedback regulation, and stress reactivity. In participant groups with MDD but no history of childhood trauma, measures of HPA axis regulation did not significantly differ from controls. These findings support a temporal relation in which childhood abuse precedes HPA axis changes that, in turn, precede negative outcomes in adulthood (in this case, PTSD or MDD). Contrasting findings were found for the abused participants without MDD or

TRAUMA EXPOSURE AND HEALTH

PTSD. These groups generally showed no alterations in circulating hormone levels or negative feedback regulation. Of note, however, compared to controls, abused participants without MDD or PTSD exhibited lower reactivity to HPA axis stimulation, contrary to expectation. In these individuals, lower stress reactivity may serve as a protective factor for MDD and PTSD. Combined with results from Nicholson and colleagues (2010), it is possible that HPA axis dysregulation mediates the relation between childhood abuse and adult depression or PTSD, rather than the other way around. These results also appear to suggest that HPA axis dysfunction may be specific to MDD or PTSD diagnosis, rather than a nonspecific outcome of exposure to childhood abuse. However, this finding contradicts that of other studies (e.g., Carpenter, 2007; Heim et al., 2000), so more research is needed.

Another integral part of the stress response is the immune response, which releases proinflammatory cytokines in response to stress. Cytokines, in turn, increase inflammation, serving to help the body heal wounds and fight infections. Both physical and psychological stress has been found to trigger the inflammatory response (Kendall-Tackett, 2009). Although these responses are adaptive under normal circumstances, cases of severe or chronic stress can cause inflammation levels to remain abnormally high. Through a variety of physiological mechanisms beyond the scope of this review, when proinflammatory cytokines are too high, humans become more vulnerable to disease. Emerging psychoneuroimmunology (PNI) research has found that exposure to trauma leads to increased levels of proinflammatory cytokines. Inflammation is associated with many serious health problems, including coronary heart disease, myocardial infarction, impaired immune function, chronic pain syndromes, and Alzheimer's disease (see Kendall-Tackett, 2009, for review).

In an early PNI study, delayed-type hypersensitivity, an *in vivo* physiological test of cellular immunity, was examined in subjects with PTSD due to childhood sexual and physical abuse (Altemus, Cloitre, & Dhabhar, 2003). PTSD subjects had significantly higher

TRAUMA EXPOSURE AND HEALTH

mean delayed-type hypersensitivity reactions than matched controls, signifying greater inflammatory responses. In a more recent study, nuclear factor (NF)- κ B pathway activity was measured in medically healthy women with or without a history of childhood abuse and current PTSD (Pace et al., 2012). The NF- κ B pathway controls the expression of genes that code for multiple inflammatory cytokines. Compared to controls, higher NF- κ B pathway activity was found in women with childhood abuse-related PTSD, indicating elevated inflammation.

Although delayed-type hypersensitivity and NF- κ B pathway activity are often measured, C-reactive protein (hsCRP) is considered to be one of the most reliable indicators of inflammation. In a longitudinal, prospective study, a birth cohort of 1,037 participants was followed for 32 years (Danese, Pariante, Caspi, Taylor, & Poulton, 2007). Childhood maltreatment was investigated in the first decade of life and hsCRP levels were measured at 32 years. Multiple measures of childhood maltreatment were collected, in addition to prospective reports later in life; 26.7% experienced one indicator of childhood maltreatment, referred to as the probable maltreatment group, and 9.8% experienced two or more indicators of childhood maltreatment, referred to as the definite maltreatment group. Children in the definite maltreatment group were 1.8 times and children in the probable maltreatment group were 1.18 times more likely to have elevated hsCRP levels in adulthood than children in the non-maltreatment group. As found in previous studies, maltreated children were also significantly more likely to experience co-occurring early life risks, including low birth weight, SES, and low IQ in childhood. However, even when controlling for early life risks, the relation between childhood maltreatment and elevated adult hsCRP maintained significance (relative risk [RR] = 1.58; i.e., maltreated group 1.58 times more likely to have elevated hsCRP levels in adulthood). Furthermore, maltreated children were at increased risk of stress in adulthood, including three factors related to inflammation: low SES, major

TRAUMA EXPOSURE AND HEALTH

depression, and high perceived stress. However, consistent with early life stress, the relation of childhood maltreatment to elevated adult hsCRP remained significant after controlling for these factors ($RR = 1.64$). Finally, children who experienced maltreatment were significantly more likely to be in poorer health in adulthood and engage in risky health behaviors, including smoking, low physical activity, and poor diet, factors that have been linked to inflammation in adulthood. Still, after controlling for these factors, the relation between childhood maltreatment and elevated adult hsCRP remained significant ($RR = 1.76$). Moreover, after controlling for all co-occurring childhood and adulthood risk factors concurrently, the relation between childhood maltreatment and elevated adult hsCRP continued to be significant ($RR = 1.61$). Further, the significant association generalized to fibrogen and white blood cells, two other common indicators of inflammation. Notably, the association was dose-responsive, with more severe abuse corresponding with more severe inflammation.

In an effort to determine when the effects of extreme childhood stress on inflammation emerge, Danese et al. (2007) examined a sample of 12-year-old children who were participating in a twin study. Children from 41 homes where there was at least some evidence of physical maltreatment were compared with children from homes where there was no evidence of maltreatment. The children were matched on important factors, including family SES, gender, and zygosity. Depressive symptoms and inflammation at age 12 were assessed. Children who were both maltreated and depressed showed significantly higher levels of hsCRP compared to control children. On the other hand, children who were depressed but not maltreated and children who were maltreated but not depressed showed hsCRP levels comparable to controls. This study provides the first evidence that the beginnings of stress-related abnormalities in inflammatory processes can be traced all the

TRAUMA EXPOSURE AND HEALTH

way back to childhood years, but may be evident only in those children with histories of maltreatment experiencing concurrent depression.

Biological changes are one probable pathway through which trauma effects health. The biological pathway focuses on chronic activation of the stress response system and consequent effects on health. Both the HPA axis and the immune system, key elements of the stress system, have shown alterations in individuals exposed to trauma. Childhood maltreatment may be particularly robust because this type of trauma exposure tends to be ongoing and occurs during a critical developmental period for the brain.

Psychological pathway

Research has highlighted the potential risk that psychological disorders pose for subsequent physical health. Trauma exerts at least a twofold increased risk for different types of psychopathology, including depression, anxiety, and behavior problems (Felitti & Anda, 2010). Further, numerous studies have connected psychopathology to adverse health outcomes. Depression and PTSD, two common mental health consequences of exposure to trauma, have been particularly associated with health conditions (Ford, 2004).

The association between retrospectively reported childhood adversities and first onset psychological disorder across the lifespan was examined in 51,945 adults in a cross-national World Health Organization epidemiological study (Kessler et al., 2010). Samples from 21 countries were included, most being nationally representative household samples. Twelve types of childhood adversities occurring before age 18 were assessed, including three types of interpersonal loss (parental death, parental divorce, other separation from parents), four types of parental maladjustment (mental illness, substance misuse, criminality, violence), three types of maltreatment (sexual abuse, physical abuse, and neglect), and two other childhood adversities (life-threatening respondent physical illness, family economic adversity). Notably, similar proportions of respondents reported any childhood adversity in high- (38.4%), high-

TRAUMA EXPOSURE AND HEALTH

middle- (38.9%), and low-/lower-middle- (39.1%) income countries. Parental death was the most common type of childhood adversity (12.5%), followed by physical abuse (8.0%), parental divorce (6.6%), family violence (6.5%), and parental mental illness (6.2%). Multiple adversities were common, with 38.4% of those reporting any childhood adversity indicating two or more adversities. Results indicated that all 12 types of childhood adversities were associated with increased risk of psychiatric disorders according to *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., *DSM-IV*; American Psychiatric Association, 1994) criteria in all countries, including mood disorders, anxiety disorders, behavior disorders, and substance use disorders. Greatest odds for lifetime mental disorder diagnosis were found for maladaptive family functioning, with parental mental illness conferring the greatest risk ($OR = 2.0$), followed by physical ($OR = 1.8$) and sexual ($OR = 1.8$) abuse. Further, as the number of adversities associated with maladaptive family functioning increased, odds ratios increased, but the increasing odds occurred at a decreasing rate as the numbers of adversities increased. Although of slightly smaller magnitude, other childhood adversities significantly increased risk for mental disorders, as well ($OR = 1.1$ – 1.4). Population-attributable risk proportions suggest that the elimination of childhood adversities would lead to a 41.6% reduction in behavior disorders, 31.0% in anxiety disorders, 27.5% in substance disorders, and 22.9% in mood disorders.

Polyvictimization was examined in two studies of individual samples of female undergraduate students (Richmond, Elliott, Pierce, Aspelmeier, & Alexander, 2009). Thirty-four behaviorally-specific types of victimization were assessed, falling into the categories of peer/sibling abuse, physical assault, witnessed/indirect victimization, sexual victimization, child maltreatment, or property crime. A very high percentage of women in both samples reported at least one type of victimization (97% and 98%), with almost half in each sample reporting at least one type of victimization in five or more of the six categories. Results were

comparable for each study. A significant proportion of the variance in psychological distress was accounted for by polyvictimization, with each category of victimization alone accounting for little additional variance above that accounted for by polyvictimization alone. When the six categories of victimization were considered simultaneously, only the sexual victimization and childhood maltreatment categories in the first study and those two categories in addition to peer/sibling victimization in the second study added unique variance to the prediction of psychological distress. However, when polyvictimization was added into the model alongside the six categories of victimization, it became the only variable whose unique contribution was significant for most outcome measures approximating psychological distress. Similar to previous studies, results indicate that a vast majority of those who experience one type of childhood victimization are likely to experience additional types, as well. These studies also indicate that polyvictimization is common in a non-clinical sample of undergraduate students, and that this experience has a unique impact on psychological distress.

Although the majority of data on trauma and psychological outcomes comes from retrospective reports, it is important to compare such results to findings from studies utilizing prospective designs. One study linked New Zealand national child protection agency records with data from a nationally representative community survey of *DSM-IV* (1994) mental disorders (Scott, McLaughlin, Smith, & Ellis, 2012). Childhood traumatic experiences included sexual abuse, physical abuse, and witnessing intimate partner violence. Maltreatment was prospectively ascertained by identifying participants who would have been children at the time of child protection agency reporting. Odds of mental disorders were compared for three groups of respondents: (a) those with prospectively ascertained maltreatment (i.e., those with child protection agency records regardless if they reported it retrospectively), (b) those with retrospectively ascertained maltreatment (i.e., those without child protection agency records who reported childhood maltreatment in the survey), and (c)

TRAUMA EXPOSURE AND HEALTH

those with no reported maltreatment. Odds of both 12-month and lifetime prevalence for all mental disorders examined (mood, anxiety, and drug use disorders), with the exception of alcohol use disorder, were two- to fourfold greater for both maltreatment groups. Moreover, the magnitude of associations was not significantly different between retrospectively or prospectively-reported maltreatment groups. Studies utilizing retrospective or prospective reports both appear to have merit and likely show converging results.

In addition to increased risk for psychiatric disorders, childhood adversity appears to increase risk for functional impairment associated with psychiatric disorders (McLaughlin et al., 2010). Respondents included 9,282 adults, nationally representative of the U.S. household population, and the same twelve categories of childhood adversity described previously (Kessler et al., 2010) were examined. Disorder-specific role impairment was assessed, focusing on the extent to which their disorder interfered with their roles in their social life, intimate relationships, work, and household maintenance. Results revealed that 85.7% of the childhood adversities related to maladaptive family functioning significantly predicted the likelihood of being categorized in the severe range of impairment in any of the four areas assessed. Further, 60% of the other childhood adversities significantly predicted severe impairment. Results indicate a dose-response relation, with increasing odds ratios with increasing numbers of childhood adversities, from an odds ratio of 1.6 for those with one childhood adversity to odds ratios of 2.7 to 5.3 for those with five or more childhood adversities. Similar to Kessler and colleagues' results, odds of impairment with increasing numbers of childhood adversities occurred at a significantly decreasing rate as the number of childhood adversities increased. It appears that the effects of cumulative childhood adversities show a subadditive pattern of interaction (i.e., combined effects of multiple adversities are less than the product of their individual *ORs*), arguing against simply summing events to examine the effects of trauma. Childhood adversities related to

TRAUMA EXPOSURE AND HEALTH

maladaptive family functioning were observed to be the most potent forms of childhood adversity in both this study and Kessler and colleagues' study. This may be because these types of adversities are more likely to be ongoing, rather than a single event, or because they are more likely to occur with greater frequency than other types of adversities. Regardless, these findings reveal the importance of examining duration, frequency, and type of adversity.

Taken together, a multitude of studies relate exposure to trauma to diverse psychiatric disorders, including mood, anxiety, and drug use disorders. Functional disorder-related impairment is additionally evident for individuals with a history of trauma. Given the relation between psychiatric conditions and adverse health, this is a second probable pathway through which trauma effects health.

Behavioral pathway

Health risk behaviors contribute to the leading causes of morbidity and mortality in the United States (Eaton et al., 2012). Important categories of health risk behaviors include tobacco use, alcohol and other drug use, risky sexual behaviors, unhealthy dietary practices, and physical inactivity. These behaviors are typically established during childhood and adolescence and frequently extend into adulthood. Many are interrelated and preventable. People who are exposed to adverse childhood experiences or trauma appear to exhibit higher rates of involvement in health risk behaviors, increasing risk for a variety of acute and chronic health problems (Rheingold, Acierno, & Resnick, 2004). It is probable that health risk behaviors serve as one mechanism by which trauma contributes to adverse health outcomes.

Data from the ACE study was examined to elucidate the potential connection between childhood adversity and smoking tobacco (Anda et al., 1999). Five smoking behaviors were assessed: early smoking initiation, smoking initiation as an adult, ever smoking, current smoking, and heavy smoking. ACEs included in this analysis were emotional, physical, and

TRAUMA EXPOSURE AND HEALTH

sexual abuse, a battered mother, parental separation or divorce, and growing up with substance-abusing, mentally ill, or incarcerated household members. Included in this analysis were data from 98% of wave I participants (cases with missing data were excluded), which consisted of 4,958 women and 4,527 men. Sixty-three percent of participants reported at least one ACE category, with more women than men reporting all types of adversities with the exception of physical abuse. Prevalence of smoking in the sample was 14.4%. All categories of ACEs were found to be significantly associated with ever smoking and heavy smoking. The relations remained significant after controlling for parental smoking and household substance abuse, decreasing the likelihood that the associations are accounted for by genetic influences or social modeling. Sexual abuse that occurred by the age of 14 years and preceded smoking onset was associated with a fourfold increase in initiating smoking and a nearly threefold increase in current smoking. Further, a dose-response relation was found between the number of categories of ACEs reported and each smoking behavior. For instance, age of smoking onset for those who endorsed ever smoking showed a strong graded relation such that age of smoking onset decreased as the number of adversities increased (from 0 through 8 categories of ACEs, ages of onset were 20.9, 19.3, 19.0, 19.4, 18.6, 18.5, 17.4, 17.5, and 17.3 years, respectively). The clear dose-response relations evident for smoking behaviors support a causal model in which adverse childhood experiences lead to smoking. Unanswered questions remain, however, including why persons exposed to these experiences turn to the use of nicotine. One possibility is that nicotine serves as a psychoactive coping device for distress consequent to childhood adversity. In this study, there was a strong relation between ACEs, current smoking, and depression, providing some support for this hypothesis.

In a second study utilizing the ACE dataset, illicit substance use was examined (Dube et al., 2003); however, only data from wave II participants were included in this analysis

TRAUMA EXPOSURE AND HEALTH

because wave II included questions about illicit substance use that were not included in wave I. All ten categories of ACEs (i.e., sexual, physical, or emotional abuse; physical or emotional neglect; growing up with household substance use, criminality of household members, mental illness among household members, and parental discord and illicit drug use) were examined in this sample of 4,665 women and 3,948 men. Findings indicated that for each category of ACE, early drug initiation increased two- to fourfold and the likelihood of lifetime use significantly increased. The total ACE score increased risk of drug initiation in early adolescence, mid-adolescence, and adulthood in a strong graded fashion, with initiation in early adolescence displaying the strongest graded relation. The relation may be strongest in adolescence due to the close temporal proximity of ACEs at this time period. Evidence that the relation extends into adulthood highlights the long-term effects that ACEs can impose on illicit substance use. Further, the total ACE score increased the likelihood of ever having drug problems, ever experiencing drug addiction, and parenteral drug use in a similar dose-response way. Notably, analysis revealed that approximately one-half to two-thirds of serious illicit substance use is attributable to abuse and adverse experiences (56%, 63%, and 64% for lifetime drug problem, lifetime addiction, and lifetime parenteral drug use, respectively). Because of the serious health, social, and economic burdens associated with serious drug use, understanding, preventing, and treating the effects of ACEs becomes vitally important.

Findings were supported by data from a large, nationally representative sample of adults 20 years of age and older (Afifi, Henriksen, Asmundson, & Sareen, 2012). Participants included 34,653 men and women who completed surveys assessing childhood sexual, physical, or emotional abuse, and childhood emotional or physical neglect and interviews assessing substance use disorders (SUDs). For both men and women, CSA, CPA, and childhood emotional abuse were associated with a higher prevalence of all lifetime SUDs after adjusting for sociodemographic factors. For women, physical neglect was associated

TRAUMA EXPOSURE AND HEALTH

with higher odds of all SUDs; for men, this relation held for all SUDs except for heroin abuse and dependence. Finally, emotional neglect was associated with an increased risk for all SUDs among women, and for all SUDs among men with the exception of amphetamine and cocaine abuse or dependence disorders. There appears to be a robust relation between childhood maltreatment and substance use disorders in adulthood.

Childhood maltreatment and stressful life events are an established risk factor for early alcohol use initiation, alcohol-related problem behaviors, and alcohol use disorders (Enoch, 2011). One recent community study examined the interaction of childhood maltreatment and recent stressful life events on drinking behavior (Young-Wolff, Kendler, & Prescott, 2012). A variety of past-year stressful life events were assessed, including job loss, major financial problems, legal problems, divorce or separation, robbery, or serious illness or injury. Stressful events involving members of participants' social networks were also assessed, including death, serious illness or personal crisis, or serious interpersonal problems with the participant. Events were categorized as being dependent on the participant's behavior or independent of his/her behavior. Results indicated that independent stressful life events were related to greater alcohol consumption among women with histories of childhood maltreatment. On the other hand, dependent stressful life events were not associated with greater risk of stress-related drinking behavior. It appears that childhood maltreatment may predispose individuals to greater vulnerability to stress, particularly stressful events perceived as uncontrollable or unpredictable. Alternatively, childhood maltreatment may increase individual's maladaptive coping efforts in the face of stress. In either case, these findings suggest that it is important to examine both proximal and distal stressful or traumatic life events.

Another health risk behavior linked to childhood maltreatment, particularly CSA, is sexual risk behavior. In a recent integrated review of the literature, 73 studies were identified

TRAUMA EXPOSURE AND HEALTH

that addressed CSA and sexual risk behavior (Senn, Carey, & Venable, 2008). Overall, CSA showed a consistent relation with sexual risk behaviors across studies. The association was substantiated in men and women, adolescents and adults, and in the general population and clinical populations. In particular, most studies found a relation between CSA and more sexual partners, earlier initiation of sexual intercourse, and sex trading. Other sexual risk behaviors found in many studies include more unprotected sex, co-occurrence of sex and substance use, STD diagnosis, and HIV diagnosis. The majority of studies focused on CSA, but it is important to consider that results may be confounded with other forms of abuse or stressful life events. Because childhood maltreatment and other forms of adverse experiences tend to co-occur, it is impossible to determine whether sexual risk behaviors are directly related to CSA, or to the additive effects of additional types of adverse experiences in these studies. Another type of possible confound is between sexual outcomes and CSA itself. For instance, some, but not all, studies ask about age at first consensual intercourse, specifically. In those that do not, it is unclear whether age at first intercourse reflects sexual abuse experience or later purposeful sexual behavior. In spite of these limitations, there appears to be a clearly established link between CSA and greater sexual risk taking. Nonetheless, it will be important for future studies to incorporate various types of stressful life events and to explicitly examine age at first consensual sexual intercourse to eliminate these confounding factors.

In sum, evidence has been found to support a variety of factors as mechanisms through which traumatic event exposure affects physical health outcomes. Most likely, the relation is mediated through a complex interaction of biological, psychological, and behavioral mechanisms. Further research is needed to elucidate further mechanisms, thereby leading to a more complete understanding of how trauma affects physical health.

Experiential Avoidance

Recently, there has been mounting interest in *experiential avoidance* (EA) as a risk factor for psychopathology. EA has been defined most explicitly within the Acceptance and Commitment Therapy (ACT) model, in which EA is described as an unwillingness to “contact” unwanted private experiences (e.g., emotions, thoughts, memories, bodily sensations) and attempts to alter their duration, form, or frequency (Hayes, Strosahl, & Wilson, 2011). In certain contexts, suppressed behavior or subtle avoidance of distressing thoughts or memories can be self-protective and adaptive, such as attempting to inhibit signs of anxiety during a job interview or trying not to show feelings of boredom during a conversation. In these contexts, EA is relatively benign, and negative consequences, including expending excess energy and being less than fully engaged, are minimal. EA becomes a distorted process when it is applied rigidly, such that immense time, energy, and effort are expended to suppress or control unwanted internal experiences. Therefore, in ACT, EA is contextualized, such that EA reflects an inability to commit action in line with values and goals due to unwillingness to experience certain private events. Avoidance outside the framework of the pursuit of valued goals is of little concern in ACT because any self-regulatory strategy, even those that are avoidance-based, is adaptive or maladaptive depending on the needs of the situation (Kashdan & Rottenberg, 2010).

EA can be considered a psychologically-closed, defensive, and rigid approach to the world within. It is contrasted with experiential acceptance or psychological flexibility, which has been defined as “contacting the present moment as a conscious human being, fully and without needless defense—as it is and not as what it says it is—and persisting with or changing a behavior in the service of chosen values” (Hayes et al., 2011, p. 96-97). EA is supported by *fusion*, which refers to excessive regulation of behavior by verbal processes, or the tendency to allow mental events like memories, thoughts, meaning-making, and

TRAUMA EXPOSURE AND HEALTH

narratives about the world to dominate over lived experience (Hayes et al., 2011). For instance, as EA increases, individuals may form inflexible rules about the need to avoid or control experiences evaluated negatively (e.g., “anxiety is bad”). As individuals strengthen their adherence to these verbal rules, attempts to avoid distressing private events increases, which, in turn, increases the functional importance of these distressing events and decreases the individual’s sensitivity to context. If “anxiety is bad,” individuals will become extremely distressed by the experience of anxiety and do everything they can to eliminate it. They lose contact with what they really want in life, besides “feeling good” and avoiding psychological pain. Behavioral repertoires narrow and become increasingly detached from values and goals, decreasing the likelihood of persistence or change in the service of a meaningful life (Hayes et al., 2006). Anxiety in social situations, for instance, becomes a valid reason for social withdrawal, even when relationships are highly valued. Taken together, EA, which has been increasingly referred to as psychological inflexibility, involves maintaining rigid dominance of psychological reactions instead of chosen values in guiding action; this frequently occurs when people “fuse with evaluative and self-descriptive thoughts and attempt to avoid experiencing unwanted internal events... reducing their contact with the present moment, and decreasing their likelihood of taking values-based actions” (Bonds, 2002, p. 678).

The paradox of EA is that attempts to control, suppress, or avoid distressing internal experiences, such as emotions or bodily sensations, appear to increase their accessibility, frequency, intensity, or severity and increase vulnerability to psychological distress (for review, see Hayes et al., 1996). Indeed, EA has been described as a pathological process recognized by most systems of therapy and is considered to be critical to the development and maintenance of psychopathology (Hayes et al., 1996). Research has implicated EA in a wide variety of psychopathology and quality of life problems, including depression, anxiety, PTSD, substance abuse, self-harm, pain, stress, job performance, and negative affectivity (for

TRAUMA EXPOSURE AND HEALTH

reviews, see Chawla & Ostafin, 2007; Hayes et al., 2006). A meta-analysis (Hayes et al., 2006) indicates that EA, as measured by the Acceptance and Action Questionnaire (AAQ), accounted for 16-28% of the variance in behavioral health problems in general. Pertinent to the present discussion, recent theory and research have identified EA as an important process in trauma; EA may, in fact, be a critical factor contributing to negative sequelae of trauma exposure.

Several researchers have conceptualized many of the long-term correlates of childhood maltreatment as forms of tension-reducing behaviors or avoidance (e.g., Briere & Runtz, 1993; Polusny & Follette, 1995). Childhood maltreatment is intensely distressing for victims; prominent emotional responses often include guilt, fear, shame, anger, sadness, and helplessness (Resick, Monson, & Rizvi, 2008). Although behavioral outcomes (e.g., substance abuse, self-mutilation, high risk sexual behaviors) observed in survivors of childhood abuse are quite diverse in form, they may actually serve the same function, allowing victims to avoid the experience of these distressing thoughts and emotions (Hayes et al., 1996). For instance, Briere and Runtz (1993) noted that these kinds of dysfunctional behaviors serve as coping strategies that allow individuals to reduce or circumvent painful internal states rather than fully experience the pain of abuse-specific awareness. Similarly, Polusny and Follette (1995) detailed a theory of emotional avoidance, adapted from a model developed by Hayes (1987) that suggests that behavioral strategies are employed to temporarily escape or mitigate abuse-related internal experiences. Further, emotional avoidance behaviors (e.g., dissociation, self-mutilation, substance abuse) are negatively reinforced by the reduction of the distressing affective responses associated with trauma exposure. In the long term, however, these strategies lead to a variety of adverse consequences, each of which may increase risk of health problems. For instance, difficulties in interpersonal functioning may result from emotional avoidance related to interpersonal

TRAUMA EXPOSURE AND HEALTH

trauma, such as avoidance of intimacy in sexual abuse survivors. Poor relationships and low social support are correlates for negative health outcomes. Emotional avoidance may also lead to behaviors that result in additional stressors, increasing risk of health problems. Adult survivors of childhood sexual abuse are known to be at higher risk of revictimization (for review, see Polusny & Follette, 1995). Dissociation, a common emotionally-avoidant experience after abuse, may impede survivors' abilities to detect and withdraw from potential harm in social situations. In addition, CSA survivors' tendencies to engage in emotionally avoidant risky behaviors, including high-risk sexual behaviors and substance use, may interact to increase vulnerability to revictimization and poor health (Polusny & Follette, 1995).

In support of these conceptual models, research indicates that trauma-exposed individuals tend to rely more heavily on avoidance-focused coping strategies than approach-focused coping strategies (Grasso et al., 2012; Leitenberg, Greenwald, & Cado, 1992; Littleton, Horsley, John, & Nelson, 2007). Approach-focused strategies involve proceeding toward the source of stress or one's reaction to it (e.g., seeking emotional support, planning to resolve the stressor), whereas avoidance-focused strategies involve evading the stressor or one's reaction to it (e.g., emotional suppression, distraction, denial, behavioral and mental disengagement, and alcohol and drug use; Grasso et al., 2012; Karekla & Panayiotou, 2011; Littleton, Horsley, John, & Nelson, 2007). In a meta-analysis of 44 studies assessing trauma coping and distress, avoidant coping was significantly associated with general distress, depression, and posttraumatic stress symptoms (Littleton et al., 2007). Although some factors that are subsumed under avoidant coping (e.g., mental disengagement, denial) can be considered forms of EA, these factors have not been clustered together and considered as a latent construct. Therefore, EA overlaps with avoidant coping, but it is distinct and contributes unique variance in explaining psychological distress and quality of life (Karekla

& Panayiotou, 2011). Ineffective coping strategies (e.g., avoidance, detachment) are component processes of the broader construct of EA. EA is postulated as a tendency or style of responding, rather than as a coping strategy. Indeed, individuals who exhibit higher levels of EA do tend to use coping methods associated with poorer outcomes, including avoidant coping, and may apply these coping strategies in inflexible or indiscriminate ways. The unique variance may relate to greater emphasis in EA on avoidance of internal experiences rather than control of the stressor itself.

Likewise, EA can be differentiated from the avoidance and numbing symptom cluster consistent with PTSD diagnostic criteria. Symptoms characteristic of PTSD are associated with trauma-related cues, such that individuals make deliberate attempts to avoid reminders (e.g., people, situations, thoughts) of the traumatic event (*DSM-IV-TR*, American Psychiatric Association, 2000). In contrast, EA is characterized by a more general tendency to avoid unwanted experiences. EA involves negative evaluations of internal experiences, accompanied by a tendency for emotional and cognitive control. Consequently, individuals engage in unworkable patterns of behavior, inconsistent with valued life directions, so as to avoid these unwanted experiences. Trauma survivors may attempt to avoid experiences unrelated to their trauma history. For example, they may inhibit the experience and expression of positive emotions to maintain a sense of control. Although related and overlapping, EA can be considered a broader construct than avoidance and emotional numbing symptoms characteristic of PTSD (Kashdan & Kane, 2011; Morina, Stangier, & Risch, 2008).

Many studies have found EA, measured by the AAQ, to be a significant predictor and mediator of psychological functioning following trauma exposure (Batten et al., 2002; Gratz et al., 2007; Marx & Sloan, 2002; Palm & Follette, 2011). In one study, EA and emotional expressivity (i.e., extent to which an individual withholds or expresses their current emotional

TRAUMA EXPOSURE AND HEALTH

state) were examined in relation to CSA and psychological distress (Marx & Sloan, 2002) in undergraduate women. Findings indicated that positive CSA status, high EA, and low emotional expressivity were significantly related to greater psychological distress. However, only EA mediated the relation between CSA status and distress. These results provide support for the premise that rigid attempts to avoid aversive private events following trauma exposure predispose some trauma survivors to develop psychopathology.

In a second study, two trauma response styles were investigated in relation to PTSD symptomology (Orcutt, Pickett, & Pope, 2005). These response styles can be conceptualized as representing approach or avoidance styles, respectively: (a) forgiveness, which requires engagement with one's negative emotions and thoughts after an interpersonal offense, and (b) EA, which involves avoidance of negative emotions and thoughts. In this sample of college undergraduate students, both EA and forgiveness were found to partially mediate the relation between interpersonal trauma exposure and PTSD symptoms. Although both constructs accounted for distinct variance, EA accounted for a greater proportion of the variance than forgiveness. Forgiveness may actually require a certain level of experiential acceptance, because true forgiveness cannot occur until an individual has experienced and worked through the painful emotions and memories associated with the trauma (Enright, 2001, as cited in Orcutt et al., 2005).

In another study, peritraumatic dissociation and EA were examined in relation to PTSD symptom severity (Marx & Sloan, 2005). Participants included undergraduate men and women who endorsed having experienced one or more traumatic events (e.g., serious accident, natural disaster, non-sexual assault, sexual assault, torture, life-threatening illness). Marx and Sloan hypothesized that peritraumatic dissociation may serve as a proxy for later EA. Peritraumatic dissociation includes experiencing, at the time of the traumatic event, derealization, depersonalization, amnesia, out-of-body experiences, or altered time

TRAUMA EXPOSURE AND HEALTH

perception. Results indicated that at baseline, both EA and peritraumatic dissociation predicted PTSD symptom severity. However, after baseline levels of PTSD symptoms were controlled, only EA continued to predict PTSD symptom severity at both 4- and 8-weeks later. Contrary to expectations, findings do not support the role of peritraumatic dissociation as a proxy for EA; however, results do suggest that EA plays an important role in the maintenance of PTSD symptoms.

In a three-part study using diverse samples, Plumb, Orsillo, and Luterek (2004) investigated the role of EA in predicting post-event psychological functioning. The first study was prospective in design, assessing 362 undergraduate students at baseline and 8-week follow-up. One hundred eighteen students reported experiencing a stressful life event that had an “extremely negative” impact on their lives during the 8-week period. Results indicated that EA at the first session predicted psychological distress at the second session over and above distress at session one. In a second study expanding on the first, EA was investigated in relation to psychological functioning in 107 female and 52 male undergraduate students who endorsed lifetime exposure to one or more traumatic events. Findings signified that EA was a better predictor of posttraumatic stress symptom severity than trauma severity, accounting for 13% of the unique variance. In addition, EA accounted for 31% of the variance in psychological distress. The third study was a replication of the second study, but with a clinical, treatment-seeking sample of 37 male veterans in inpatient treatment for PTSD from combat exposure. Similar to results in undergraduates, EA predicted symptom severity over and above combat exposure severity, accounting for 13% of the unique variance. Further, EA accounted for 28% of the variance in depression symptoms. In a separate study, Rosenthal, Hall, Palm, Batten, and Follette (2005) examined EA in a sample of female undergraduate students who reported various levels of CSA severity. EA was found to be a more significant predictor of posttraumatic symptoms than CSA severity. In fact, EA fully

TRAUMA EXPOSURE AND HEALTH

mediated the relation between CSA severity and psychological distress. Taken together, these studies provide additional evidence for the important role of EA in the development of psychological distress subsequent to traumatic or stressful life events. Further, findings indicate that EA may be a stronger predictor of distress than either previous symptoms of distress or severity of the traumatic event.

In a recent review of the empirical literature on trauma, EA, and psychological outcomes, 15 studies were identified that specifically utilized assessment measures grounded in the mindfulness and acceptance literature, including the AAQ, the AAQ-II, the Five Facet Mindfulness Questionnaire, and the Kentucky Inventory of Mindfulness Skills (Thompson, Arnkoff, & Glass, 2011). All studies demonstrated associations between EA and negative psychological outcomes. Notably, these associations were found in samples with diverse ethnocultural backgrounds, sexual orientations, trauma histories, and ages at which the traumatic event occurred.

Very little research has extended findings regarding the relation between trauma and EA to the realm of physical health. In a pilot evaluation, participants included 23 HIV-positive gay men who had a history of methamphetamine use and reported experiencing some type of traumatic event in their lifetime (Chartier et al., 2010). Participants reporting greater EA also reported greater current PTSD symptoms, greater past 30-day use of methamphetamine, poorer HIV/AIDS management, and greater medication-related symptoms. In another study examining a small community sample of Kosovar civilian war survivors, somatic complaints were found to relate to higher levels of EA (Morina, Ford, Risch, Morina, & Stangier, 2010). Further, EA partially mediated the relation between somatic distress and both psychological distress and quality of life.

Clearly, given the significant impact of trauma exposure on a variety of physical health outcomes, more research is needed to examine the relation between trauma, EA, and

TRAUMA EXPOSURE AND HEALTH

health. It is possible that EA may serve as an important mechanism by which trauma affects physical health, and may relate to all three of the theoretical pathways: biological, psychological, and behavioral.

As evident in this review, the literature clearly substantiates the relation between traumatic event exposure and poor physical health outcomes. Studies examining various populations, different kinds of traumatic events, and diverse physical health outcomes have all made important contributions. Nonetheless, the majority of research has focused on childhood abuse or neglect, specifically. Further, most studies use dichotomous measures indicating the presence or absence of trauma exposure. However, the severity or frequency of trauma, assessed by a continuous score, is likely to be a better predictor of health outcomes as suggested by the literature on cumulative effects.

Moreover, few studies have examined younger adults or college students. More research is needed to understand how a variety of traumatic events relate to physical health perceptions, status, health-related quality of life, and health-risk behaviors among college students. College students are an important population not only because they report high rates of trauma exposure (i.e., estimates ranging from 50% to 84%; Grasso et al., 2012; Green et al., 2000; Smyth, Hockemeyer, Heron, Wonderlich, & Pennebaker, 2008; Vrana & Lauterbach, 1994), but also because health beliefs and habits are just beginning to form and are more likely to be amenable during these formative years.

The few studies that have explicitly focused on trauma and EA have investigated psychological outcomes. There appear to be very few studies investigating EA with respect to trauma and physical health outcomes, and none utilizing samples generalizable to a larger population (i.e., only HIV-positive gay men who use methamphetamine or Kosovar civilian war survivors). Such a link could identify an important focus for prevention and treatment efforts. Interventions targeting EA processes, such as ACT (Hayes, 2011) or Dialectical

TRAUMA EXPOSURE AND HEALTH

Behavior Therapy (Linehan, 1993), could be successfully used with trauma-exposed persons to both treat and help prevent health-related consequences.

CHAPTER THREE

THE PRESENT STUDY

The purpose of the present study was to investigate experiential avoidance as a mediator of the relation between traumatic event exposure and health outcomes in a sample of undergraduate male and female students. The prevalence of exposure to traumatic events is similar for college students to that of community residents, with estimates ranging from 50% to 84% (Grasso et al., 2012; Green et al., 2000; Smyth et al., 2008; Vrana & Lauterbach, 1994). College students, who are transitioning into young adulthood and becoming increasingly independent, are an important target population because health-related beliefs, values, and lifestyles are often consolidated during this formative period. In fact, the predominant risk behaviors for the leading causes of mortality (e.g., coronary heart disease, cancer, and stroke) are typically established during young adulthood, including smoking, alcohol use, dietary habits, and sedentary lifestyles (Williams, Holmbeck, & Greenley, 2002). Health risk behaviors are highly prevalent among the more than 20 million college students nationwide (Synder & Dillow, 2012), with more than 36% of students engaging in high-risk drinking, 39% falling within the overweight or obese categories, 23% reporting current tobacco use, and 36% reporting past-year illicit drug use (Johnston, O'Malley, Bachman, & Schulenberg, 2012; Lust & Golden, 2013). However, health behaviors and beliefs are more amenable to change during this developmental period, making targeted intervention and prevention efforts all the more important (Brenner & Gowda, 2001).

The present study extended previous research by examining a mechanism by which trauma exposure may lead to poorer health outcomes. The study expanded on questions already addressed in the traumatic stress literature, but also introduced new critical questions about the relation between traumatic event exposure and physical health outcomes. Based on an extensive review of the literature, the following hypotheses were proposed:

TRAUMA EXPOSURE AND HEALTH

1. Students who report greater frequency of trauma exposure will endorse poorer health outcomes compared to students who report less frequency of exposure.
 2. Students who report greater PTSD symptom severity will endorse poorer health outcomes compared to students who report less PTSD symptom severity.
 3. Students who report greater EA will endorse poorer health outcomes compared to students who report less EA.
 4. EA will mediate the relations between frequency of trauma exposure and health outcomes.
- See Figure 1 for a graphic representation of the hypothesized mediation model.
5. EA will mediate the relations between frequency of trauma exposure and health outcomes beyond the effect of PTSD symptom severity.

Exploratory analyses will investigate whether students exposed to interpersonal traumatic events differ from those exposed to non-interpersonal traumatic events in relation to health outcomes.

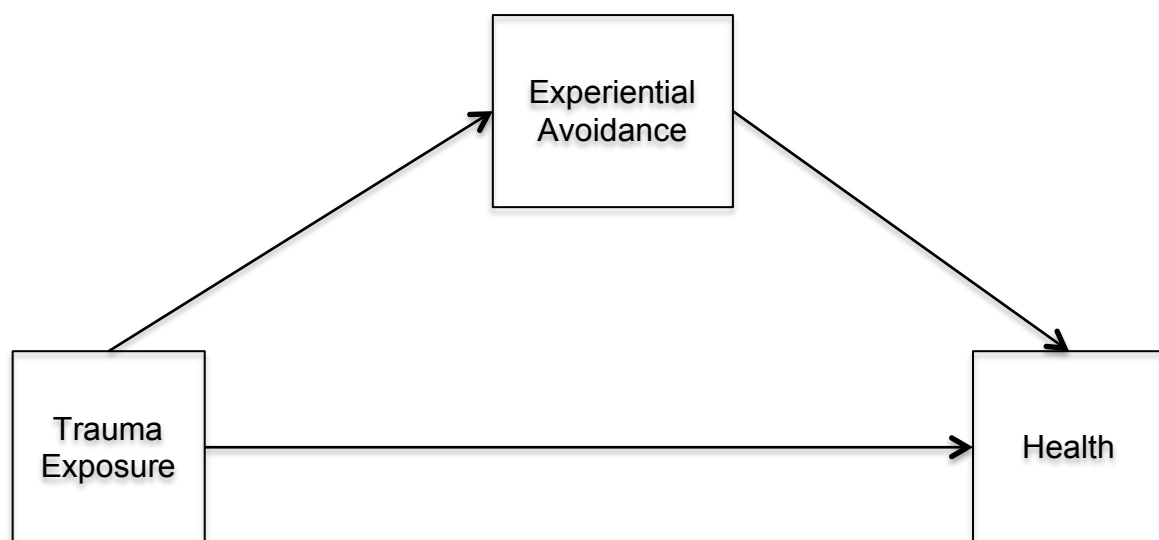


Figure 1. Hypothesized mediation model.

CHAPTER FOUR

METHOD

Participants

Participants included 218 undergraduate students recruited through the General Psychology Subject Pool at a northeastern university in the United States. All participants received credit toward the research requirement for their General Psychology course. Participation in the Psychology Subject Pool is voluntary; all students had the option to review journal articles as an alternative to participation. Based on pre-screening, participants 18 years or older who reported exposure to one or more traumatic events were invited to participate in this study.

Of the 218 participants who completed the study, 12 denied exposure to all traumatic events on the Traumatic Life Events Questionnaire and, as per inclusion criteria, were excluded from analyses. In addition, one participant was excluded due to excessive missing data. Following exclusion of these cases, the final participant sample ($N = 205$) included 121 women (59.0%) and 84 men (41.0%). Ages ranged from 18 to 25 years ($M = 19.09$, $SD = 1.08$). Participants' racial/ethnic background was 77.6% white, 11.2% African American/Black, 4.9% multiracial, 2.9% Hispanic/Latino, 2.0% Asian/Pacific Islander, and 2.0% of another or unspecified background. Majority of participants were full-time (99.5%), freshman (71.2%), and living in a dormitory or residence hall (71.7%). Nearly all (98.5%) were single or never married. Twenty-three participants (11.7%) were social fraternity or sorority members, seven (3.6%) were NCAA athletes, six (3.0%) were international students, and five (2.5%) were veterans. Most (93.5%) had some form of health insurance coverage. A majority of participants (78.5%) reported never having been diagnosed with a mental health disorder, and 67% reported, to the best of their knowledge, that neither of their parents was ever diagnosed with a mental health disorder. Regarding family's yearly income growing up,

TRAUMA EXPOSURE AND HEALTH

41.0% reported over \$50,000, 21.5% reported \$35,001 to \$50,000, 16.6% reported \$25,001 to \$35,000, 14.1% reported \$15,001 to \$25,000, and 6.8% reported \$15,000 or less.

Measures

Demographics

All participants completed a brief form assessing demographic variables, including gender, age, racial/ethnic background, marital status, year in school, school status (i.e., full or part time), residence (e.g., dormitory), family income growing up, health insurance coverage (i.e., *yes/no*), international status, intercollegiate athletic status, sorority/fraternity affiliation status, veteran status, and history of mental illness diagnosis for self and parents.

Sociodemographic variables were used for descriptive purposes and included in analyses as covariates.

Trauma Exposure

Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000). The TLEQ is a 23-item self-report questionnaire that assesses exposure to a broad spectrum of potentially traumatic events as specified in Criterion A1 of the diagnostic criteria for PTSD (i.e., experiencing or witnessing an event(s) that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others) in the *DSM-IV-TR* (American Psychiatric Association, 2000). A comprehensive list of 22 behaviorally-specific potentially traumatic events and a 23rd category of “other events” with examples are included. Example items include, “Were you physically punished in a way that resulted in bruises, burns, cuts, or broken bones?” and “Were you involved in a motor vehicle accident for which you received medical attention or that badly injured or killed someone?” For each event, respondents are asked the number of times it occurred on a 7-point scale (ranging from *never* to *more than 5 times*). Some events ask about the presence of injury (*yes/no*). For victimization questions, characteristics of the perpetrator (e.g., *stranger?* *yes/no*) are assessed. In addition, the TLEQ

TRAUMA EXPOSURE AND HEALTH

assesses Criterion A2 of the diagnostic criteria for PTSD (i.e., the subjective experience of intense fear, helplessness, or horror) for the most serious occurrence of each event type.

However, the TLEQ was adapted for the present study by eliminating these questions to be consistent with the exclusion of this part of the diagnostic criteria in the *DSM-5* (American Psychiatric Association, 2013). Interpersonal events (i.e., involving a traumatic interaction between two people) include childhood sexual and physical abuse, assaults (sexual and nonsexual), robbery, intimate partner violence, stalking, and threat of injury or death. Non-interpersonal events include natural disaster, accidents (motor vehicle and other), sudden death of a close friend or loved one, life-threatening illness, life-threatening or permanently disabling event for a loved one, miscarriage, and abortion.

In this study, traumatic event exposure was defined as endorsement of one or more traumatic events. Exposure to interpersonal trauma was defined as endorsement of one or more traumatic interpersonal events. Trauma exposure scores were generated by summing the values associated with frequency of exposure. The possible range of scores is 1 to 154, with higher scores indicating greater frequency of exposure. In the present study, the mean score was 9.54 ($SD = 9.00$), with a range of 1 to 52.

Two subscales were also generated: an interpersonal trauma exposure frequency score and a non-interpersonal trauma exposure frequency score. Exposure to interpersonal (i.e., involving intentional, personal assaultive acts or violations perpetrated by others) trauma versus non-interpersonal trauma as related to health outcomes was compared. Total trauma exposure frequency, interpersonal trauma exposure frequency, and non-interpersonal trauma exposure frequency were tested in separate analyses.

The TLEQ measures a broader range of potentially traumatic events compared to other trauma inventories. The measure has demonstrated good psychometric properties and high convergent validity with structured clinical interviews (Kubany et al., 2000). Content

validity is considered excellent. Mean test-retest reliability over two weeks is 86%. Similar good psychometric properties are observed when used with college students.

PTSD Symptoms

PTSD Checklist-Civilian Version (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1993). The PCL-C is a 17-item self-report measure that includes the PTSD symptoms that correspond to the *DSM-IV-TR* diagnostic criteria. On a scale from 1 (*not at all*) to 5 (*extremely*), respondents rate the degree to which each symptom has bothered them during the past month. Prior research demonstrates that most respondents endorse multiple traumatic events in multiple categories on the TLEQ. Thus, responses to the PCL-C reflect symptoms from any accessible, intrusive, traumatic events. The total PCL-C score is an indicator of PTSD symptom severity, and is computed by summing the scores for all items. The possible range of scores is 17 to 85, with higher scores indicating greater PTSD symptom severity. In the present study, the mean score was 36.40 ($SD = 15.18$), with a range of 17 to 85. This is similar to the mean score for college students in another study ($M = 29.12$, $SD = 12.31$; (Conybeare, Behar, Solomon, Newman, & Borkovec, 2012). However, unlike in Conybeare and colleagues' study, only those students who reported some kind of trauma were included in the present study, possibly accounting for the slightly higher mean in this sample. Using the recommended cut-off score of 50 (Weathers et al., 1993), 40 participants (19.5%) would be considered probable to meet the criteria for PTSD.

The PCL-C has shown good construct validity when compared with the Clinician Administered PTSD Scale, the gold standard PTSD assessment (Weather et al., 1993). The psychometric properties are also good among non-clinical samples of undergraduate students. In the college student population, favorable levels of internal consistency (Chronbach's $\alpha = .94$, $n = 474$) and test-retest reliability ($r = .66$, $n = 316$) were found. Support for both convergent and divergent validity was reported, with moderate correlations between the PCL-

TRAUMA EXPOSURE AND HEALTH

C and other established self-report measures of PTSD, and low correlations between the PCL-C and measures of social phobia, generalized anxiety disorder, worry, agoraphobia, obsessions and compulsions, and depression (Conybeare et al., 2012).

Recent Life Experiences

Inventory of College Students' Recent Life Experiences (ICSRLE; Kohn, Lafreniere, & Gurevich, 1990). The ICSRLE is a 49-item self-report measure of daily life hassles designed specifically for use with college students. Example items include “struggling to meet the academic standards of others,” “not enough time to meet your obligations,” “conflicts with boyfriend/girlfriend/spouse,” and “loneliness.” Respondents describe the extent of their experience with each item over the past month by rating each item from 1 (*not at all* part of my life) to 4 (*very much* a part of my life). Total scores are the sum of item ratings. The possible range of scores is 49 to 196, with higher scores indicating greater daily hassles. In the present study, the mean was 96.78 ($SD = 23.70$), with a range of 50 to 187. This is similar to mean daily hassles reported in another sample of college students ($M = 95.74$; Kohn et al., 1990). Daily hassles are important to control in analyses because they serve as proximal stressors that relate to adverse health outcomes (see Kohn et al., 1990).

Good psychometric properties for the ICSRLE are evident. Items correlate positively with the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983), a measure of appraised stress. Evidence for good convergent and divergent validity has been found (Osman, Barrios, Longnecker, & Osman, 1994). Internal consistency is excellent (.92).

In the present study, one participant had 10 missing values on the ICSRLE (20.83% of the measure), so this case was deleted from analyses.

Experiential Avoidance

Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011). The AAQ-II is a 7-item self-report measure of EA, or psychological flexibility. Example items include “Emotions cause problems in my life,” and “My painful experiences and memories make it difficult for me to live a life that I would value.” Respondents rate items on a Likert scale from 1 (*Never true*) to 7 (*Always true*). Scores are obtained by summing the seven item scores. The possible range of scores is 7 to 49, with higher scores indicating greater experiential avoidance, and lower scores indicating greater psychological flexibility. In the present study, the mean was 19.82 ($SD = 10.40$), with a range of 7 to 48.

Across six samples ($N = 2,816$), the AAQ-II demonstrated good convergent, discriminant, and incremental validity (Bond et al., 2011). Reliability of the AAQ-II is good, with a mean internal consistency across the six samples of .84, and 3- and 12-month test-retest reliabilities of .81 and .79, respectively.

Overall Health

RAND 36-Item Short Form Health Survey (RAND-36; Hays, Sherbourne, & Mazel, 1993). The RAND-36 is a self-report measure of health-related quality of life (HRQOL) and functional health impairment across multiple domains. The 36 items are identical to the Medical Outcomes Study short-form health survey (SF-36; Ware & Sherbourne, 1992), but the recommended scoring method differs slightly in the pain and general health dimensions. The measure was modified for the current study to include only those 21 items that load onto the following physical health domains: physical functioning, role limitations due to physical health, bodily pain, general health perceptions, and social functioning. The physical functioning scale consists of 10 items that measure an individual’s limitations in physical activities because of health. The role limitations due to physical health scale consists of four items that measure the extent to which physical health interferes with

TRAUMA EXPOSURE AND HEALTH

doing work or other typical daily activities. The pain scale consists of two items that measure pain frequency and the extent of role interference. The general health perceptions scale consists of five items that measure an individual's perceptions of health in general, such as feeling well or ill. The social functioning scale consists of two items that measure the extent to which health interferes with social activities with family, friends, neighbors, or groups. Item scores are various points Likert scales and *yes/no* responses.

The RAND-36 is scored in two steps. First, each item is scored on a scale from 0 to 100, with a higher score reflecting greater HRQOL. Second, items in the same domain are averaged together to create subscale scores. Subscale scores were used in the present study as health outcome variables. The range of possible subscale scores is 0 to 100, with higher scores indicating greater health. In the present study, the mean for general health was 65.51 ($SD = 18.33$; range 15-100), pain was 79.98 ($SD = 17.70$; range 10-100), physical functioning was 91.44 ($SD = 16.73$; range 0-100), social functioning was 85.73 ($SD = 21.24$; range 0-100), and physical role functioning was 82.20 ($SD = 30.92$; range 0-100).

Basic findings regarding the validity and reliability of the RAND-36 are exemplary, and this is a widely utilized measure in both the health and trauma literature (McHorney, Ware, & Lu, 1994; McHorney, Ware, & Raczek, 1993). Reliability estimates for all of the scale scores are .78 or higher.

Physical Health Symptoms and Conditions. A checklist developed for the present study was administered to assess physical health symptoms pertaining to the following areas: cardiovascular, neurological, ear-nose-throat, musculoskeletal, genitourinary, respiratory, and gastrointestinal. This checklist was created by reviewing structured protocols and symptom procedures commonly used among physicians and nurses (Rudy & Gray, 1986). The checklist consisted of 64 health symptoms. Participants were asked to indicate if these symptoms had been a problem for them in the past 6 months, and if so, how frequently these

TRAUMA EXPOSURE AND HEALTH

symptoms had occurred. Frequency was assessed on a 5-point Likert scale from *less than once/month* to *daily or almost daily*. Similarly, participants were given a list of 39 physical health conditions and asked to indicate if they have ever had the condition, if it had been a problem for them during the past 6 months, and if it was self- or physician-diagnosed.

For health symptoms, 17 participants (8.5%) did not check *yes* to experiencing any of the health symptoms in the past 6 months, but indicated a frequency for each symptom (vs. indicating a frequency only for those items endorsed as *yes* to having experienced). Because it was difficult to determine if these cases meant *yes* or *no* to experiencing the symptom, the variable signifying total health symptoms endorsed (i.e., total *yeses* to having experienced the symptom in the past 6 months) was dropped from analyses. This variable was not critical to study hypotheses because frequency of symptoms could be used to assess the same construct. All missing data for frequencies were changed to a value of 1 (vs. missing data = 0), so that a value of 1 for frequency came to signify *never/less than once per month* (vs. 0 being *never* and 1 being *less than once per month*). After this imputation, only frequency variables were computed and analyzed for health symptoms. In summary, frequency scores were calculated for each participant for each health symptom and ranged from *never/less than once per month* to *daily or almost daily*.

The range of possible scores for total health symptoms was 64 to 320, with higher scores indicating greater frequency of health symptoms. In the present study, the mean for total health symptoms was 85.54 ($SD = 19.15$), with a range of 64 to 160. The range of possible scores for past 6-month and lifetime medical conditions was 0 to 39, with higher scores indicating greater medical conditions. In the present study, the mean for past 6-month medical conditions was 1.94 ($SD = 2.23$; range 0-13), and the mean for lifetime medical conditions was 2.65 ($SD = 2.52$; range 0-14).

TRAUMA EXPOSURE AND HEALTH

Two participants had missing data for all items on both the health symptoms and conditions questionnaires, and four participants had missing data for all items on the health conditions questionnaire only. Results of independent samples T-tests confirmed that these cases significantly differed from cases with complete data on several variables (i.e., PTSD symptoms, physical role functioning, pain, social role functioning, and general health). Therefore, case deletion would be biased because cases with complete data on these questionnaires are likely to be unrepresentative of the population (Schafer & Graham, 2002). Instead, a conservative approach was taken and health symptoms and conditions for these cases were assumed to be negative (i.e., never experienced).

Health Behaviors

National College Health Risk Behavior Survey (NCHRBS; CDC, 1997). The NCHRBS, developed by the CDC in collaboration with representatives from colleges and universities, relevant national organizations, and other federal agencies, was adapted from the Youth Risk Behavior Surveillance System (YRBS) to monitor priority health-risk behaviors among college students nationwide. Selected items from the NCHRBS, designed for self-administration, were used to assess cigarette smoking, illicit substance use, sexual behavior, diet, and exercise. In the present study, sixteen health risk items and eight preventive health items were used. Responses are provided via various Likert-type scales and *yes/no* options. Psychometric properties for the NCHRBS are unavailable, but the YRBS is considered to have good reliability and validity (Brener, Collins, Kann, Warren, & Williams, 1995). Two-week test-retest reliability was adequate to good, with estimates ranging from .61 to 1.0 for individual items.

Smoking. Two items assess smoking patterns: “During the past 30 days, on how many days did you smoke cigarettes?” with responses ranging from *0 days* to *All 30 days*, and “During the past 30 days, on the days that you smoked, how many cigarettes did you smoke

TRAUMA EXPOSURE AND HEALTH

per day?” with responses ranging from *I did not smoke cigarettes during the past 30 days* to *More than 20 cigarettes per day*.

Illicit substance use. One item assesses marijuana use: “During the past 30 days, how many times did you use marijuana?” with responses ranging from *0 times* to *40 or more times*. Four items assess lifetime use of cocaine (including powder, crack, or freebase), inhalants, steroids, and other illegal drugs (e.g., LSD, PCP, ecstasy, mushrooms, speed, ice, or heroin). One item assesses past 30-day illicit drug use in combination with alcohol.

Sexual behavior. Eight items assess sexual behavior. Sample items include “During the past 3 months, with how many people did you have sexual intercourse?” “During the past 30 days, did you or your partner use a condom?” and “Did you drink alcohol or use drugs before you had sexual intercourse last time?”

Diet. Four items assess diet, including frequency of consumption (from *0 times* to *3 or more times*) on the previous day of fruit, fruit juice, green salad, or cooked vegetables.

Exercise. Four items assess exercise. Sample items include “On how many of the past 7 days did you exercise or participate in sports activities for at least 20 minutes that made you sweat and breathe hard, such as basketball, jogging, swimming laps, tennis, fast bicycling, or similar aerobic activities?” and “On how many of the past 7 days did you do exercise to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?” Responses are on a 7-point scale from *0 days* to *7 days*.

In the present study, a risk behavior index was created based on health risk behavior item responses in the domains of smoking, illicit substance use, and sexual behavior. For each item, responses were coded such that no engagement in a particular risk behavior yielded a score of 0, minimal/experimental engagement scored 1, and more frequent/heavy engagement scored 2. The scores were summed to obtain a total risk score ranging from 0 to

TRAUMA EXPOSURE AND HEALTH

32. Higher scores equal greater total risk. In the present study, the mean risk score was 6.82 ($SD = 4.92$), with a range of 0 to 21.

Likewise, a preventive health behavior index was created based on preventive health behavior item responses in the domains of diet and exercise. All responses to these questions were based on a 4- or 8-point Likert scales. To prevent items from having different weights, 8-point Likert items were recoded to scores 1 through 4. Scores for all items were added together to create a total preventive health score ranging from 8 to 32. Higher scores equal greater total preventive health behaviors. In the present study, the mean preventive health behavior score was 15.51 ($SD = 4.23$), with a range of 8 to 29.

Alcohol Use Disorders Identification Test (AUDIT; Saunders, 1993). The AUDIT is a 10-item self-report measure of alcohol consumption, drinking behavior/dependence, and alcohol-related consequences. Examples include “How often do you have a drink containing alcohol?” and “How often during the last year have you failed to do what was normally expected of you because of drinking?” Based on recommendations for use with college students (Kokotailo et al., 2004), question three (on binge drinking) was reduced to five or more drinks for men and four or more for women, rather than six or more. Responses are scored according to frequency of occurrence (seven items), amount consumed (one item), or using a *no/yes—not in past year/yes—in past year* format (two items). Each item is scored 0 to 4, scores are obtained by summing the values for each item, and total scores range from 0 to 40. Total AUDIT scores were used as a measure of alcohol use, with higher scores reflecting riskier use. In the present study, the mean AUDIT score was 6.96 ($SD = 5.97$), with a range of 0 to 33. This is similar to the mean score in another sample of college student ($M = 7.00$; Kokotailo et al., 2004).

Research has indicated that scores from the AUDIT are reliable and valid among a sample of college students (Kokotailo et al., 2004). When using the recommended cut-off

TRAUMA EXPOSURE AND HEALTH

score of 8, the instrument correctly identified 82% of high-risk drinkers and 78% of normal drinkers. Across 18 studies, the median internal consistency estimate was .80 (Reinert & Allen, 2002). Among a sample of university students, two-week test-retest reliability was .92 (Lennings, 1999).

Body Mass Index (BMI). BMI provides an indicator of body fatness for most people. It can be used as a screening tool for weight categories that have the potential to lead to health problems. Height (inches) and weight (pounds) were assessed to calculate BMI. BMI is computed as weight in kilograms divided by the square of height in meters. A BMI between 25 and 29.9 is overweight, and a BMI of 30 or more is considered obese. In the present study, the mean BMI was 24.66 ($SD = 4.78$), with a range of 16.27 to 44.93.

Procedures

During the first week of classes of the spring semester, all students in General Psychology who elected to participate in the Subject Pool were given a pretest to identify students who report exposure to at least one traumatic event. Students were invited to participate in the study if they endorsed exposure to one or more traumatic events. Participants were informed that the study was examining the relation between stressful life events, lifestyle choices, and health, and that their participation was voluntary.

Participants completed questionnaires in approximately 60-minute sessions in groups of 20 or fewer students. All measures were administered through the secure, internet-based survey program “Qualtrics” in a Psychology Department computer lab. Before beginning participation, the researcher explained informed consent to the participants, asked participants to read the informed consent form, and provided an opportunity for participants to ask questions. Participants were assured of confidentiality and anonymity. Students indicated their agreement to take part in the study digitally by checking an “agree” button to start the Qualtrics program. Questionnaires were administered such that individual measures

TRAUMA EXPOSURE AND HEALTH

(but not items) were presented in a random order. No personal identifiers were included in the database. Upon completion of the study, each participant was thanked and provided with a debriefing form that included information about the purposes of the study and a list of campus and community mental health resources in the event that the testing session caused any distress or discomfort. Due to the sensitive nature of these questionnaires, a licensed psychologist, Dr. Laura Knight, was available to speak with any participants who experienced distress during their participation; no students reported experiencing any distress.

Data Analyses

Only data from participants reporting trauma exposure, defined as endorsement of at least one item on the TLEQ, were used. All statistical procedures were performed using the Statistical Package for Social Sciences (SPSS), Version 22.

Multiple regression analyses were used to test the first three hypotheses and the exploratory hypotheses. First, demographic variables, frequency of traumatic event exposure (TLEQ scores), daily hassles (ICSLRE scores), and each health outcome (e.g., BMI, total health conditions, in separate analyses) were entered into an equation. Second, demographic variables, daily hassles, PTSD symptom severity (PCL-C scores), and each health outcome were entered into an equation. Third, demographic variables, daily hassles, EA (AAQ-II scores), and each health outcome were entered into an equation. Finally, in exploratory analyses, frequency of interpersonal traumatic event exposure was regressed on each health outcome, and frequency of non-interpersonal traumatic event exposure was regressed on each health outcome.

Bootstrapping analyses were used to test the fourth and fifth hypotheses. In the following description, M signifies the mediator, a relates the independent variable (X) to the mediator, and b relates the mediator to the dependent variable (Y). The indirect effect of X on Y through M is the product of the a and b path (ab).

The most widely used method to assess mediation is Baron and Kenny's (1986) causal steps approach; however, contemporary perspectives highlight problems with this approach (MacKinnon, Fairchild, & Fritz, 2007; Preacher & Hayes, 2004; Rucker, Preacher, Tormala, & Petty, 2011). Importantly, the power to detect mediated effects using this method is very low. The Baron and Kenny causal steps approach requires that there be a significant relation between the independent and dependent variables. However, research demonstrates many cases in which significant mediation exists, but the requirement of a significant relation between X and Y is not obtained (MacKinnon et al., 2007). Requiring the X and Y relation substantially reduces power to detect real mediation effects. Further, particularly in small samples, it is possible that the a and/or b coefficient is nonsignificant due to low statistical power, resulting in failure to meet two critical criteria for mediation identified by Baron and Kenny.

Contemporary researchers recommend an alternative, more powerful, strategy for testing mediation in which the focus is on examining the magnitude of indirect effects (MacKinnon et al., 2007). Focusing on the presence and size of the indirect effect precludes reliance on significance of the $X \rightarrow Y$ relation. Emphasis is instead placed on (1) whether there is evidence of an indirect effect (i.e., statistical significance), and (2) the size of the indirect effect.

Bootstrapping is also recommended because it is a nonparametric approach to effect-size approximation and hypothesis testing that makes no distributional assumptions (Preacher & Hayes, 2004). It produces a test that can be applied to small samples with confidence because it is not based on large-sample theory. Therefore, regardless of the significance of the $X \rightarrow Y$ relation, bootstrapping is a preferred alternative to the Baron and Kenny approach. This method involves bootstrapping the sampling distribution of ab and deriving a confidence interval with the bootstrapped sampling distribution. In bootstrapping analyses, a

TRAUMA EXPOSURE AND HEALTH

large number of samples of size n (n is the original sample size) are gathered from the data and sampled with replacement. The indirect effect, ab , is derived in each sample. Macros for SPSS are available that provide a test of the indirect effect relying on this nonparametric bootstrapping procedure. The macros provide a bootstrap estimate of ab , an estimated standard error, and 95% and 99% confidence intervals for population value of ab . In the present analysis, a 95% confidence interval will be used. If zero is not in the 95% confidence interval, the conclusion can be drawn that the indirect effect is significantly different than zero at $p < .05$ (two-tailed).

CHAPTER FIVE

RESULTS

Preliminary Analyses

Missing Data

All cases in the present study were examined for missing data. Missing data handling methods were selected based on the extent of missing data points per variable and suspected reasons for missingness. Literature on missing data procedures was consulted.

Excluding health symptoms and conditions, described previously, item-level missing data (i.e., item nonresponse) was extremely low across measures. All measures had less than 0.5% of total observations missing. Generally, missing data points were spread across participants. Except as described in the measures section, item-level missing data were handled by imputing the person-level mean of the nonmissing items for that factor. In other words, the average of the participant's non-missing values for a particular factor were substituted for the missing value. Schafer and Graham (2002) recommend person-level mean imputation instead of item-level mean imputation.

Multivariate Assumptions

Assumptions of multivariate linear regression including linearity, normality, homoscedasticity, and lack of multicollinearity were examined using visual inspection of P-P plots, histograms, residual plots, and review of collinearity diagnostics. Substantial skewness and kurtosis were evident for many outcome variables. Transformations using Tukey's Ladder of Powers were computed and assumptions were re-evaluated until adequate transformations were found. Data that were negatively skewed were first reflected (i.e., $[\text{Largest value } n_L + 1] - [\text{original value } n_X]$), and then transformed. The following variables were transformed prior to regression analyses: physical functioning (logarithmic), pain (square root), physical role functioning (logarithmic), social functioning (square root), past 6-

TRAUMA EXPOSURE AND HEALTH

month medication conditions (square root), lifetime medical conditions (square root), ear/nose/throat symptoms (inverse square root), musculoskeletal symptoms (square root), neurological symptoms (square root), cardiovascular symptoms (inverse square root), gastrointestinal symptoms (inverse square root), genitourinary symptoms (inverse squared), total health symptoms (logarithmic), and alcohol use (square root). General health, the health risk behavior index, and the preventive health behavior index met assumptions without transformation.

Bootstrapping analyses do not depend on statistical assumptions. Original, untransformed variables were used for mediation analyses.

Descriptive Analyses

Zero-order correlation coefficients for all scales are reported in Table 1.

Trauma Exposure

The range of traumatic events experienced was one to 14 events, with four (20.5%), and three (18.5%) events most commonly reported. Table 2 reports the frequency and percentage of participants reporting each traumatic event on the TLEQ. The most frequently reported traumatic events in this sample were sudden unexpected loss of a loved one ($n = 137$; 66.8%), life threat to a loved one ($n = 115$; 56.1%), natural disaster ($n = 75$; 36.6%), personal life threat ($n = 64$; 31.2%), being stalked ($n = 48$; 23.4%), witnessing family violence ($n = 47$; 22.9%), unspecified unwanted sexual attention ($n = 46$; 22.4%), serious motor vehicle accident ($n = 45$; 22.0%), and “other” life threatening or highly disturbing events ($n = 43$; 21.0%).

Medical Conditions

For lifetime medical conditions, zero conditions were most frequently reported (22.0%), followed by one (17.6%), two (16.6%), and three (14.1%) conditions. A similar pattern emerged for past 6-month medical conditions, with zero conditions most frequently

TRAUMA EXPOSURE AND HEALTH

Table 1

Zero-order Correlations of All Scales

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. Trauma exposure	—																						
2. PTSD symptoms	.312 **	—																					
3. EA	.254 **	.707 **	—																				
4. Daily hassles	.300 *	.590 **	.570 **	—																			
5. General health	-.010	-.331 **	-.458 **	-.401 **	—																		
6. Physical functioning	-.123	-.170 *	-.170 *	-.163 *	.162 *	—																	
7. Pain	-.252 **	-.299 **	-.350 **	-.332 **	.414 **	.330 **	—																
8. Role physical functioning	-.162 **	-.280 **	-.295 **	-.239 **	.346 **	.294 **	.385 **	—															
9. Social functioning	-.220 **	-.246 **	-.262 **	-.193 **	.257 **	.284 **	.409 **	.376 **	—														
10. Alcohol use	-.003	.054	-.002	.025	-.064	.181 **	.105	.014	.084	—													
11. Past 6 month medical conditions	.246 **	.237 **	.314 **	.266 **	-.336 **	-.108	-.334 **	-.155 *	-.112	-.015	—												
12. Lifetime medical conditions	.251 **	.245 **	.285 **	.274 **	-.331 **	-.116	-.303 **	-.186 **	-.083	-.019	.864 **	—											
13. Total health symptoms	.268 **	.490 **	.491 **	.447 **	-.473 **	-.033	-.292 **	-.140 *	-.063	-.065	.414 **	.602 **	—										
14. Ear/nose/throat	.126	.253 **	.305 **	.281 **	-.359 **	-.177 *	-.503 **	-.194 **	-.169 *	.018	.494 **	.429 **	.664 **	—									
15. Musculoskeletal	.293 **	.381 **	.422 **	.358 **	-.350 **	-.151 *	-.382 **	-.272 **	-.142 *	.002	.431 **	.468 **	.791 **	.423 **	—								
16. Neurological	.197 **	.404 **	.413 **	.404 **	-.426 **	-.233 **	-.370 **	-.268 **	-.219 **	.042	.349 **	.457 **	.832 **	.514 **	.582 **	—							
17. Cardiovascular	.197 **	.460 **	.373 **	.290 **	-.249 **	-.041	-.285 **	-.201 **	-.142 *	.039	.395 **	.353 **	.710 **	.280 **	.513 **	.498 **	—						
18. Respiratory	.026	.147 *	.193 **	.108	-.329 **	-.182 **	-.393 **	-.313 **	-.216 **	.050	.403 **	.349 **	.545 **	.484 **	.290 **	.346 **	.289 **	—					
19. Gastrointestinal	.221 **	.368 **	.292 **	.380 **	-.323 **	-.123	-.256 **	-.175 *	-.168 *	-.137	.455 **	.464 **	.732 **	.290 **	.461 **	.589 **	.485 **	.279 **	—				
20. Genitourinary	.201 **	.362 **	.408 **	.333 **	-.332 **	-.198 **	-.515 **	-.316 **	-.223 **	-.002	.586 **	.499 **	.627 **	.284 **	.451 **	.477 **	.327 **	.282 **	.503 **	—			
21. Risk behaviors	.193 **	.064	.083	.061	-.056	.053	.005	-.086	-.030	.481 **	.044	.028	.148 *	.015	.147 *	.156 *	.127	.133	.082	.065	—		
22. Preventive behaviors	.162 *	-.033	-.129	-.012	.219 **	-.102	-.047	-.095	-.077	.058	-.102	-.072	-.056	-.007	-.038	-.090	-.025	-.034	-.017	-.078	.071	—	
23. BMI	.029	-.088	-.059	.039	-.084	-.114	.064	.023	.123	.035	.086	.101	-.081	-.011	-.093	-.012	-.095	-.086	-.088	-.010	-.099	.050	—

Note: * = $p < .05$, ** = $p < .01$. $N = 205$ for all analyses.

TRAUMA EXPOSURE AND HEALTH

reported (36.1%), followed by one (16.1%), two (13.7), and three (13.2%) conditions. The most frequently reported medical conditions can be seen in Table 3, with only those conditions endorsed by greater than 10% of participants reported.

Table 2

Frequency and Percentage of Participants Reporting Each Event on the TLEQ (N = 205)

Traumatic event	Frequency	Percent
Sudden death of close friend or loved one	137	66.8
Life-threatening or permanently disabling event for loved one	115	56.1
Natural disasters	75	36.6
Threat of death or serious bodily harm	64	31.2
Stalking	48	23.4
Witness to family violence	47	22.9
Unspecified unwanted sexual attention or contact	46	22.4
Motor vehicle accidents	45	22.0
Other event	43	21.0
Other accidents	39	19.0
Witness to severe assault of acquaintance or stranger	39	19.0
Physical abuse by an intimate partner	33	16.1
Childhood physical abuse	29	14.1
Severe assault by acquaintance or stranger	23	11.2
Robbery with weapon	22	10.7
Sexual abuse during adolescence	22	10.7
Sexual abuse before age 13 by someone at least 5 years older	13	6.3
Life-threatening illness	12	5.9
Sexual abuse before age 13 by someone close in age	11	5.4
Sexual abuse as an adult	10	4.9
Abortion	6	2.9
Miscarriage	5	2.4
Warfare or combat	1	0.5

Note: Numbers represent frequency and percentage of participants reporting exposure to each event (i.e., yes/no) rather than the number of times exposed to each event.

Multiple Regression Analyses

Hierarchical multiple regression analyses were conducted using each measure of health outcome as the criterion variables (transformed, if applicable): SF-36 general health, physical functioning, pain, physical role functioning, and social functioning; ear/nose/throat, musculoskeletal, neurological, cardiovascular, respiratory, gastrointestinal, genitourinary, and total health symptoms; lifetime and past 6-month medical conditions; AUDIT alcohol use; BMI; health risk behavior index; and preventive health behavior index. Based on prior

TRAUMA EXPOSURE AND HEALTH

research, theoretical knowledge, and demonstrated correlations with outcome variables in the present study, gender, race/ethnicity, mental health diagnosis, and family income were entered into step 1 and proximal stressors (i.e., Inventory of College Students' Recent Life Experiences) into step 2 of the regressions to serve as controls. No other demographic variables in the present study correlated with outcome variables.

Table 3

Frequency and Percentage of Participants Reporting Medical Conditions (N = 205)

Medical condition	Lifetime frequency (percentage)	Past 6-month frequency (percentage)
Asthma	55 (26.8)	26 (12.7)
Problems with blood circulation in arms, legs, or elsewhere	22 (10.7)	21 (10.2)
Chronic rash or skin condition (eczema, psoriasis, chloracne, or dermatitis)	28 (13.7)	22 (10.7)
Kidney, bladder, or urinary tract problem	23 (11.2)	20 (9.8)
Repeated trouble with neck, back, or spine	39 (19.0)	31 (15.1)
Concussion or period of being knocked unconscious	32 (15.6)	12 (5.9)
Allergies or inability to take certain medications or eat certain foods	33 (16.1)	23 (11.2)
Painful or irregular menstrual periods, or other trouble with menstruation	52 (43.0) ^a	44 (36.4) ^a
Vaginal infections such as yeast infection	33 (27.3) ^a	23 (19.0) ^a
Problems that occur monthly just before menstrual period such as severe abdominal bloating, headache, and breast tenderness	75 (62.0) ^a	68 (56.2) ^a

Note: ^a = percentages based only on female participants ($n = 121$). For all conditions, only those with percentages greater than 10% are reported.

It is important to note that because certain variables were reflected prior to transformation, as previously described, and others involved an inverse transformation, negative beta weights in regression equations for these variables actually reflect a positive relation, and vice versa. This applies to pain, physical functioning, physical role functioning, and social functioning, which were reflected prior to transformation, as well as ear/nose/throat, cardiovascular, gastrointestinal, and genitourinary symptoms, which involved an inverse transformation.

Hypothesis 1: Students who report greater frequency of trauma exposure will endorse poorer health outcomes compared to students who report less frequency of exposure.

Hierarchical multiple regressions were performed to assess the ability of frequency of traumatic event exposure to predict each health outcome. Separate regression equations were derived for each health outcome variable. For each regression model, gender, race/ethnicity, mental health diagnosis, and childhood family income were entered into Block 1, recent life experiences (ICSRLE) were entered into Block 2, and trauma exposure (TLEQ) was entered into Block 3.

After controlling for demographic variables (gender, race/ethnicity, mental health diagnosis, family income) and proximal stressors, trauma exposure significantly predicted (at $p < .05$) pain; social functioning; musculoskeletal and total health symptoms; and lifetime medical conditions, such that greater frequency of trauma exposure was associated with poorer health outcomes. Additional variance accounted for by trauma exposure ranged from 13.3% (total health symptoms) to 23.4% (musculoskeletal symptoms). See Table 4 for detailed results.

Table 4

Relation of Frequency of Trauma Exposure to Health Outcomes

Criterion variable	B	Std. error	Beta	t	R ²
Pain	.044	.016	.195	2.794**	.216
Social functioning	.053	.022	.187	2.465*	.079
Lifetime medical conditions	.015	.007	.147	2.229*	.299
Musculoskeletal symptoms	.019	.005	.234	3.437**	.254
Total symptoms	.001	.001	.133	2.072*	.340

Note: * = $p < .05$, ** = $p < .01$. $N = 205$ for all analyses. Only significant relations are reported.

Trauma exposure was unrelated to general health; physical functioning; physical role functioning; ear/nose/throat, neurological, cardiovascular, respiratory, gastrointestinal, and genitourinary symptoms; past 6-month medical conditions; alcohol use; BMI; risky health

behaviors; and preventive health behaviors beyond that accounted for by other model covariates (at $p > .05$).

Hypothesis 2: Students who report greater PTSD symptom severity will endorse poorer health outcomes compared to students who report less PTSD symptom severity.

Hierarchical multiple regressions were performed to assess the ability of PTSD symptom severity to predict each health outcome. Separate regression equations were derived for each health outcome variable. For each regression model, gender, race/ethnicity, mental health diagnosis, and childhood family income were entered into Block 1, recent life experiences (ICSRLE) were entered into Block 2, and PTSD symptom severity (PCL-C) was entered into Block 3.

After controlling for demographic variables (gender, race/ethnicity, mental health diagnosis, family income) and proximal stressors, PTSD symptoms significantly predicted (at $p < .05$) physical role functioning; social functioning; musculoskeletal, neurological, cardiovascular, gastrointestinal, genitourinary, and total health symptoms, such that greater PTSD symptom severity was associated with poorer health outcomes. Additional variance accounted for by PTSD symptoms ranged from 16.6% (genitourinary symptoms) to 36.6% (cardiovascular symptoms). See Table 5 for detailed results.

Table 5

Relation of PTSD Symptom Severity to Health Outcomes

Criterion variable	B	Std. error	Beta	t	R ²
Physical role functioning	.011	.004	.201	2.376*	.129
Social functioning	.036	.015	.212	2.433*	.079
Musculoskeletal symptoms	.011	.004	.230	2.913**	.242
Neurological symptoms	.008	.003	.227	2.937**	.272
Cardiovascular symptoms	.000	.000	-.366	-4.701**	.239
GI symptoms	.000	.000	-.166	-2.087*	.231
Genitourinary symptoms	-5.620E-5	.000	-.231	-3.191**	.362
Total symptoms	.002	.000	.290	4.058**	.378

Note: * = $p < .05$, ** = $p < .01$. $N = 205$ for all analyses. Only significant relations are reported.

TRAUMA EXPOSURE AND HEALTH

PTSD symptoms were unrelated to general health, physical functioning, pain, ear/nose/throat and respiratory symptoms, lifetime and past 6-month medical conditions, alcohol use, BMI, risky health behaviors, and preventive health behaviors beyond that accounted for by other model covariates (at $p > .05$).

Hypothesis 3: Students who report greater EA will endorse poorer health outcomes compared to students who report less EA.

Hierarchical multiple regressions were performed to assess the ability of EA to predict each health outcome. Separate regression equations were derived for each health outcome variable. For each regression model, gender, race/ethnicity, mental health diagnosis, and childhood family income were entered into Block 1, recent life experiences (ICSRLE) were entered into Block 2, and EA (AAQ-II) was entered into Block 3.

After controlling for demographic variables (gender, race/ethnicity, mental health diagnosis, family income) and proximal stressors, EA significantly predicted (at $p < .05$) general health; physical role functioning; social functioning; and musculoskeletal, neurological, cardiovascular, genitourinary, and total health symptoms, such that greater EA was associated with poorer health outcomes. Additional variance accounted for by EA ranged from 17.1% (physical role functioning) to 29.0% (general health). See Table 6 for detailed results.

EA was unrelated to physical functioning; pain; ear/nose/throat, respiratory and gastrointestinal symptoms; lifetime and past 6-month medical conditions; alcohol use; BMI; risky health behaviors; and preventive health behaviors beyond that accounted for by other model covariates (at $p > .05$).

Table 6

Relation of EA to Health Outcomes

Criterion variable	B	Std. error	Beta	t	Total R ²
General health	-.511	.138	-.290	-3.704**	.276
Physical role functioning	.013	.007	.171	1.985*	.120
Social functioning	.049	.022	.200	2.259*	.075
Musculoskeletal symptoms	.018	.006	.252	3.161**	.248
Neurological symptoms	.009	.004	.182	2.295*	.260
Cardiovascular symptoms	-9.455E-5	.000	-.212	-2.588*	.208
Genitourinary symptoms	-7.429E-5	.000	-.209	-2.833**	.355
Total symptoms	.002	.001	.215	2.906**	.353

Note. * = $p < .05$, ** = $p < .01$. $N = 205$ for all analyses. Only significant relations are reported.

Bootstrapping Analyses

Determining significant mediation effects using bootstrap analysis involved taking 5,000 random samples of 205 (original sample size) from the data, replacing each value as it was sampled, and calculating the indirect effect of the independent variable (trauma exposure) on the dependent variable (each of the health outcome variables) through the proposed mediator (EA) in each sample. Significant mediation occurs if the indirect effect of this path is significantly different from zero (at $p < .05$), where the upper and lower limits of the confidence intervals do not include zero (Preacher & Hayes, 2004).

Although not required in bootstrapping, preliminary analyses were conducted to determine the relation between trauma exposure and EA. Controlling for gender, race, mental health diagnosis, and income, regression analyses revealed that trauma exposure accounted for 19.7% of the variance in EA ($p < .01$). Therefore, participants with greater frequency of trauma exposure also exhibited greater levels of EA.

Hypothesis 4: EA will mediate the relations between frequency of traumatic event exposure and health outcomes.

Individual bootstrapping analyses were run for each of the health outcome variables, controlling for gender, race/ethnicity, mental health diagnosis, childhood family income, and proximal stressors. Nonsignificant effects of mediation were found for all dependent variables.

Hypothesis 5: EA will mediate the relations between frequency of traumatic event exposure and health outcomes beyond the effect of PTSD symptom severity.

Individual bootstrapping analyses were run for each of the health outcome variables, controlling for gender, race/ethnicity, mental health diagnosis, family income, proximal stressors, and PTSD symptoms. Nonsignificant effects of mediation were found for all dependent variables.

Exploratory Analyses

Eleven items on the TLEQ were classified as interpersonal traumas (i.e., involved a traumatic interaction between two people) including assaults, robbery, sexual and physical abuse, intimate partner violence, stalking, and threat of injury or death. Of the 205 participants in the sample, 147 (71.7%) reported one or more interpersonal traumas, whereas 58 (28.3%) reported no interpersonal traumas.

Independent samples T-tests were conducted to determine whether there were significant differences between those who reported interpersonal trauma and those who did not report interpersonal trauma in relation to health outcome variables. Results indicated that significant group differences exist for pain, musculoskeletal symptoms, lifetime and past 6-month medical conditions, and health risk behaviors (at $p < .05$), such that those exposed to interpersonal traumas reported poorer health outcomes than those not exposed to

TRAUMA EXPOSURE AND HEALTH

interpersonal trauma. See Table 7 for mean and standard deviations of each group for significant health outcome variables.

Table 7

Mean and Standard Deviations for Interpersonal vs. Non-interpersonal Trauma Groups

Health outcome variable	M (SD) interpersonal trauma group	M (SD) non-interpersonal trauma group
Pain	78.35 (17.31)	84.09 (18.14)
Past 6-month medical conditions	2.15 (2.25)	1.40 (2.11)
Lifetime medical conditions	2.93 (2.25)	1.95 (2.43)
Musculoskeletal symptoms	11.01 (5.25)	9.47 (4.29)
Risk factor index	7.47 (4.85)	5.17 (4.73)

Note: Only variables with significant differences between groups are reported.

Hierarchical multiple regressions were performed to assess the ability of interpersonal and non-interpersonal trauma exposure to predict each health outcome. Separate regression equations were derived for each health outcome variable. For each regression model, gender, race/ethnicity, mental health diagnosis, and childhood family income were entered into Block 1, recent life experiences (ICSRLE) were entered into Block 2, and interpersonal trauma frequency or non-interpersonal trauma frequency were entered into Block 3.

After controlling for demographic variables (gender, race/ethnicity, mental health diagnosis, family income) and proximal stressors, interpersonal trauma significantly predicted (at $p < .05$) social functioning, musculoskeletal and cardiovascular symptoms, and preventive health behaviors, such that greater interpersonal trauma exposure frequency was associated with poorer health outcomes. Additional variance accounted for by interpersonal trauma ranged from 14.8% (musculoskeletal symptoms) to 22.9% (preventive health behaviors).

Interpersonal trauma was unrelated to general health; physical functioning; pain; physical role functioning; ear/nose/throat, neurological, respiratory, gastrointestinal, genitourinary, and total health symptoms; lifetime and past 6-month medical conditions;

TRAUMA EXPOSURE AND HEALTH

alcohol use; BMI; and risky health behaviors beyond that accounted for by other model covariates (at $p > .05$).

After controlling for demographic variables and proximal stressors, non-interpersonal trauma significantly predicted (at $p < .05$) pain, musculoskeletal and total health symptoms, and lifetime and past 6-month medical conditions, such that greater non-interpersonal trauma exposure frequency was associated with poorer health outcomes. Additional variance accounted for by non-interpersonal trauma ranged from 13.2% (total health symptoms) to 25.1% (musculoskeletal symptoms).

Non-interpersonal trauma was unrelated to general health; physical functioning; physical role functioning; social functioning; ear/nose/throat, neurological, cardiovascular, respiratory, gastrointestinal, and genitourinary symptoms; alcohol use; BMI; risky health behaviors; and preventive health behaviors beyond that accounted for by other model covariates (at $p > .05$).

Individual bootstrapping analyses were run for each of the health outcome variables, controlling for gender, race/ethnicity, mental health diagnosis, family income, and proximal stressors. For interpersonal and non-interpersonal trauma exposure, nonsignificant effects of mediation were found for all dependent variables, whether or not PTSD symptoms were controlled.

CHAPTER SIX

DISCUSSION

The purpose of the present study was to investigate experiential avoidance as a mediator of the relation between traumatic event exposure and health outcomes in a sample of undergraduate male and female students. A large literature base demonstrates that traumatic events lead to negative health outcomes. The present study aimed to expand on this research by examining a potential mechanism by which trauma exposure may lead to poor health outcomes. The results of hypothesis testing, general implications, limitations, and future directions for research are explored in the following sections.

The first hypothesis—that increased frequency of trauma exposure will relate to poorer health outcomes—was partially supported. Trauma exposure predicted greater pain, poorer social functioning, increased frequency of musculoskeletal and total health symptoms, and more lifetime medical conditions. On the other hand, trauma exposure was unrelated to general health; physical functioning; physical role functioning; ear/nose/throat, neurological, cardiovascular, respiratory, gastrointestinal, and genitourinary symptoms; past 6-month medical conditions; alcohol use; BMI; risky health behaviors; and preventive health behaviors.

Results are generally consistent with previous research demonstrating a link between trauma and negative physical health outcomes. Pain is perhaps the most widely studied physical health outcome in the trauma literature. The present results extend previous literature (e.g., Davis, 2005, Linton, 2002, Tietjen et al., 2010) by demonstrating an association between trauma and pain in a relatively young, healthy population. Most research on pain utilizes older adult or treatment-seeking populations, and rarely are college students investigated in relation to pain. Presumably, one would expect few pain-related symptoms and conditions in college students due to their youth and relative good health. In addition, the

TRAUMA EXPOSURE AND HEALTH

present study is unique in that it looks at the experience of pain, generally, rather than pain-related conditions (e.g., chronic pain, headaches, fibromyalgia) on which other research tends to focus (e.g., Brown, Berenson, & Cohen, 2005; Peterlin, Ward, Lidicker, & Levin, 2007; Von Korff et al., 2009). Finally, most research on pain and trauma examines severe and chronic types of trauma, especially childhood sexual and physical abuse. This study extends the association to include acute, and possibly less severe, types of trauma more commonly reported in the present sample, such as unexpected loss of a loved one and natural disaster. With consideration of the aforementioned points, results of the present study are significant in solidifying the association of trauma and pain. In addition to pain, results of the present study regarding other symptoms and conditions are generally consistent with previous research (e.g., Felitti et al., 1998; Irish, Kobayashi, & Delahanty, 2010; van Tilburg et al., 2010).

It is somewhat surprising that alcohol use was unrelated to trauma exposure in the present study, given previous research indicating a strong association between trauma and alcohol use (for review, see Enoch, 2011). It is possible that the association was undetected in the present study because of low rates of alcohol abuse or dependence in the sample. Using the AUDIT recommended cut-off score of 8 to detect alcohol abuse in college students, majority of the sample (61.5%) had scores that fell below the cut-off score, with the greatest frequency of participants scoring 0 (15.1%). Given that most research on trauma and alcohol use appears to focus on abuse and dependence, the nonsignificant results in the present study may indicate that the association between trauma and alcohol use only begins to appear at riskier levels of drinking. Because majority of the present sample were college freshman below the age of 21, it is unsurprising that scores were in the lower range on this measure.

Similar insignificant results were found for other risky health behaviors. However, the sample as a whole reported few risky health behaviors, restricting the range for this outcome

TRAUMA EXPOSURE AND HEALTH

variable. For example, most participants denied past 30-day cigarette (72.7%), marijuana (58.0%), and cocaine (91.7%) use; as well as lifetime inhalant (96.6%), steroid (97.6%), and other illicit drug (86.3%) use. It is possible that this restriction in range caused insignificant associations between variables that have been found to relate in previous research in which participants were engaging in riskier behaviors. In addition, the fact that data were collected for the present study in the spring semester may have further restricted the range for risky health behaviors. It is possible that students with heavier substance use behaviors are dismissed or leave college during their first semester, such that those available for participation in the spring semester have completed the first semester successfully enough to avoid dismissal.

The second hypothesis—that students who report greater PTSD symptom severity will endorse poorer health outcomes—was also partially supported. PTSD symptoms predicted poorer physical role functioning and social functioning, and increased frequency of musculoskeletal, neurological, cardiovascular, gastrointestinal, genitourinary, and total health symptoms. On the other hand, PTSD symptoms were unrelated to general health, physical functioning, pain, ear/nose/throat and respiratory symptoms, lifetime and past 6-month medical conditions, alcohol use, BMI, risky health behaviors, and preventive health behaviors.

Results are generally consistent with previous research demonstrating a link between PTSD symptoms and negative physical health outcomes. Similar to prior research (e.g., Sledjeski et al., 2008), findings of the present study suggest that PTSD may impart a greater impact on health than trauma exposure, as PTSD predicts more of the physical health outcomes than trauma exposure alone. Many studies report certain bodily symptoms, particularly the cardiovascular, neurological, and musculoskeletal systems, as relating most strongly to PTSD symptoms. Researchers suggest that these systems are more directly related

TRAUMA EXPOSURE AND HEALTH

to the basic symptoms of PTSD, including the hyperarousal of bodily systems and numbing symptoms (Flood, McDevitt-Murphy, Weathers, Eakin, & Benson, 2009). However, the present results indicate that most bodily systems are affected, not only those presumably associated directly with PTSD symptoms. Genitourinary symptoms, in particular, have been rarely connected to trauma or PTSD in previous literature. However, the present results indicate that PTSD affects the genitourinary systems, in addition to those commonly linked to PTSD (i.e., cardiovascular, musculoskeletal, neurological, gastrointestinal).

Inconsistent with past research, PTSD symptoms in the present study were not associated with alcohol use or other risky health behaviors. Again, this link may have been difficult to establish in the present study given the low engagement in risky behaviors. Unlike risky health behaviors, preventive health behaviors are infrequently studied in the trauma literature. Given insignificant relations between trauma exposure, PTSD, and preventive health behaviors in the present study, it is possible that preventive health behaviors are, in fact, unrelated to trauma. However, more research is needed to examine these relations.

The third hypothesis—that students who report greater EA will endorse poorer health outcomes—was also partially supported. EA predicted poorer general health, physical role functioning, and social functioning, as well as increased frequency of musculoskeletal, neurological, cardiovascular, genitourinary, and total health symptoms. EA was unrelated to physical functioning; pain; ear/nose/throat, respiratory, and gastrointestinal symptoms; lifetime and past 6-month medical conditions; alcohol use; BMI; risky health behaviors; and preventive health behaviors.

Although a body of literature demonstrates an association between EA and negative psychological outcomes, less research has examined EA in relation to physical health. Results from the present study provide support for the notion that greater EA relates to poorer

health outcomes. This is a promising finding and needs to be replicated and further explored in future research.

Inconsistent with previous literature, EA was not associated with alcohol use or other risky health behaviors. As alcohol use, in particular, can be conceptualized as a form of tension-reducing (i.e., experientially avoidant) behavior, these results are surprising. As previously discussed, the restriction of range in these outcome variables may account for the insignificant relation. EA may only relate to alcohol use when it becomes especially risky, such as in the case of abuse or dependence. Like alcohol use, risky sexual behavior has been conceptualized as a form of experientially avoidant behavior. Briere and Runtz (1993) hypothesized that frequent sexual contact may provide distraction, excitement, and avoidance of real intimacy, particularly in sexual abuse survivors. This relation was not found in the present study, perhaps relating to low exposure to childhood sexual abuse in the sample.

Findings from the present study also provide support for the theory that EA occurs at higher levels among individuals with greater frequency of trauma exposure and those with greater severity of PTSD symptoms. Although causal inferences cannot be confirmed due to the correlational nature of this study, it would make sense for trauma survivors to engage in EA to alleviate distress and avoid trauma reminders. Further, EA is highly effective at eliminating distress in the short term (Hayes et al., 1996), providing negative reinforcement that is likely to maintain the behavior. Indeed, trauma survivors and those with PTSD tend to utilize greater avoidance-focused coping strategies than those not exposed to trauma or those who do not develop PTSD following trauma exposure (Grasso et al., 2012; Marx & Sloan, 2002). Avoidance of trauma-related cues and reminders strengthens and perpetuates the pattern of intrusive emotions or cognitions, and use of avoidance strategies tends to increase over time (Foa & Kozak, 1986).

TRAUMA EXPOSURE AND HEALTH

Hypotheses four and five—that EA will mediate the relation between trauma exposure and health outcomes (four) and that it will do so above and beyond the effect of PTSD symptoms (five)—were unsupported. Interestingly, daily hassles, a control variable, appeared to account for a significant portion of the variance between trauma exposure and health outcomes in the mediation models. Daily hassles, or everyday stressors, can be thought of as common annoyances, or the repeated and chronic strains of everyday life, such as financial problems, too many responsibilities, or conflict with a romantic partner. Indeed, when mediation models were analyzed without controlling for the influence of daily hassles, EA was discovered to be a significant mediator for most health outcomes. This is an especially significant finding because rarely are proximal stressors measured and controlled in trauma research. For example, only one study reviewed during the extensive literature review for the present study examined proximal stressors. An unanticipated finding, it is evident that daily hassles are just as, if not more, important than traumatic experiences in relation to health. Because daily hassles are more proximal than traumatic events, it is possible that they are more potent predictors of outcomes than more distal traumatic events. On the other hand, daily hassles may have a particular impact on health in the present population because trauma exposure and PTSD symptoms were generally low.

Although most of the literature assessing the impact of stress on health focuses on traumatic or major life events, there is some evidence that daily hassles are better predictors of health outcomes than traumatic events. In one study (Rowlison & Felner, 1988), daily hassles significantly predicted physical symptomatology in adolescents above and beyond the influence of major life events. Authors of this study reminded readers that major life events and daily hassles are not entirely unrelated, as major life events (e.g., unintended pregnancy) can create greater daily hassles (e.g., financial difficulties), and vice versa. Furthermore, certain sociodemographic characteristics (e.g., gender, race/ethnicity, SES) increase the risk

TRAUMA EXPOSURE AND HEALTH

that individuals will experience both traumatic events and ongoing, everyday stressors.

Nonetheless, daily hassles and major life events do represent conceptually distinct sources of stress, and make independent contributions to measures of well-being and distress.

In another study (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982), the frequency and intensity of hassles was related to the degree of physical symptoms, and the relation was stronger for daily hassles than life events. Daily hassles continued to significantly predict physical symptoms when controlling for the effects of life events, and life events failed to add significant predictive value above daily hassles. In this study, measurements were gathered every month over the course of nine months. Daily hassle scores were found to be relatively consistent for participants over the nine-month time period. Therefore, hassles can be considered chronic, stable demands placed on individuals over time. DeLongis et al. (1982) posit that because physical health is a long-term outcome rather than a fleeting state, it is likely that a steady pattern of stress is required to have a significant effect on it.

Prior research has demonstrated that EA mediates the relations between trauma exposure and negative psychological outcomes. However, these studies did not control for recent stressors. In light of the present results, it is possible that EA would be rendered insignificant after controlling for proximal stressors in these studies. It is also possible that both EA and proximal stressors would serve to mediate the relations between trauma and health outcomes. Further research will be needed to address these questions.

Furthermore, alternative models should be considered. For example, EA may serve to moderate, rather than mediate, the relation between trauma exposure and health outcomes. Alternatively, EA may mediate the relations between trauma and health for women, but not men, or for individuals with more severe levels of PTSD symptoms.

Limitations

Several limitations of the current study should be acknowledged. First, although the sample was unique because it consisted of relatively healthy individuals, participants were young undergraduate students enrolled in psychology courses at a university in the northeastern United States. Participants were predominantly single, late teens or early 20's, and Caucasian. This limits the generalizability of results, and caution is warranted when applying these results to individuals outside of these demographics. Further, the sample demographics influence the types of traumas experienced. For example, unexpected loss of a loved one, life threat to a loved one, and natural disaster were commonly endorsed in this sample, whereas sexual abuse and combat were less represented. Related to sample demographics, the relative youth and good health of the present sample likely made it difficult to detect mediation effects due to a restriction of range in measures of physical health.

Second, this study was cross-sectional and retrospective in nature, precluding the ability to make causal statements about the relation between trauma, EA, and health. In addition, no effort was made to ensure that trauma exposure preceded outcomes of interest, such as by requiring trauma exposure to have occurred at least 6 months prior to health symptoms and conditions. Although not feasible in the present study, a prospective design would provide more definitive answers about the directionality and causality of relations between key variables.

Additional limitations are associated with the self-report nature of the measures in the present study. Self-report can be affected by a range of influences other than influences due to the specific behaviors or experiences in question. In regard to reporting of traumatic events, possible recall bias should be recognized. For example, victims of childhood sexual or physical abuse may have repressed memories of these incidences (Terr, 1991), or feelings

TRAUMA EXPOSURE AND HEALTH

of shame or guilt may inhibit a person's acknowledgement of the experience. In regard to EA, it is unclear whether individuals would know or report that they are engaging in experientially avoidant strategies. It may be valuable for researchers to develop multidimensional and objective (i.e., laboratory derived) measures of EA. Similarly, measures of physical health outcomes were self-report. More objective measures of physical health, such as a review of medical records or physiological measurements, would be beneficial to incorporate in future research.

Implications of Findings

Despite limitations, the present study has several important implications. First, findings provide further support for the connection between trauma exposure, PTSD, and poor physical health outcomes. This finding has significant public health implications, emphasizing the importance of prevention and treatment in order to protect trauma-exposed individuals from adverse health outcomes. In general, physicians and other medical providers would benefit from increased education on the relation between trauma and physical health. Because trauma-exposed individuals may first present to medical providers with symptom complaints, it is imperative that physicians carefully assess for trauma histories. After screening for trauma exposure, appropriate referrals to mental health professionals should be initiated. Likewise, mental health professionals must attend to both psychological and physical health in individuals with trauma histories, and refer to physicians as needed.

Second, although the present study does not provide support for EA as a mediator of the relation between trauma and health, it does support the notion that EA relates to poorer physical health. A large body of literature relates EA to poorer psychological and behavioral outcomes, such as substance abuse, psychopathology, and self-harm. The present study extends these results to the realm of physical health. Consequently, acceptance-based interventions that target EA, such as Acceptance and Commitment Therapy (Hayes, Strosahl,

& Wilson, 2011) and Dialectical Behavior Therapy (Linehan, 1993), may be helpful in preventing or treating physical, in addition to psychological, problems.

Third, study findings have important prevention and treatment implications regarding daily life hassles. Because everyday stressors appear to have a significant effect on health, it follows that interventions targeting daily stress or coping with stress could benefit health. From an intervention perspective, the relation between everyday stress and health presents a greater opportunity for stress management. Traumatic life events are difficult to modify or prevent, whereas daily hassles are more modifiable. For example, interventions could target interpersonal effectiveness or effectiveness at handling one's responsibilities and routines.

Finally, results of this study also have significant implications for trauma and PTSD research, generally. It appears that daily hassles, a typically ignored factor in trauma research, may have an even greater impact on health than traumatic events. It is possible that relations elucidated in the trauma research may be rendered insignificant when controlling for proximal stressors. Moreover, proximal stressors may be an important mediator of the relation between trauma and health. Some evidence suggests that trauma exposure leads to greater everyday stress (Back et al., 2008). If trauma exposure indeed leads to greater stressors or perception of stress, daily hassles may be an important causal factor accounting for negative physical health outcomes.

Suggestions for Future Research

Additional research is needed to further understand the complex relations between trauma exposure, EA, and physical health. First, researchers should carefully consider measurement issues prior to beginning any investigations. Multimodal assessment of health status should be utilized, including self-report measures, collateral information, and objective measures, such as medical records or physiological measurements. This will be important to capture the whole picture of physical health, a multi-faceted and complex domain. Similarly,

TRAUMA EXPOSURE AND HEALTH

it may be beneficial to assess PTSD symptoms via a structured clinical interview, rather than self-report only. EA was approximated in the present study by a single measure. It may be useful to measure EA in multiple ways, or include trauma-specific measurements of EA in addition to general EA.

Second, due to the restriction in range of outcome variables inherent in a non-treatment-seeking, relatively healthy population, the present study should be examined using a clinical or community sample. This would be helpful in determining if some of the insignificant relations in the present study were, indeed, related to better physical functioning of college students. It is possible that college students have not yet developed some negative health outcomes associated with trauma. Further, college students represent a relatively higher functioning proportion of the population. Those with more severe health problems or PTSD symptoms may not be able to manage the demands of college well enough to gain entry or to maintain satisfactory academic progress.

Third, longitudinal studies of the relations between trauma, EA, and physical health are necessary in order to clarify directionality and causality of relations. Finally, researchers should continue to examine the mechanisms by which trauma exerts its influence on physical health. This may include factors from the biological, behavioral, and psychological pathways, as well as interactions among pathways.

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TRAUMA EXPOSURE AND HEALTH

Appendix A

Traumatic Life Events Questionnaire

1. Have you ever experienced a natural disaster (flood, hurricane, earthquake, etc.)? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
2. Were you involved in a motor vehicle accident for which you received medical attention or that badly injured or killed someone? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
3. Have you been involved in any other kind of accident in which you or someone else was badly hurt? (examples: plane crash; drowning or near drowning; electric or machinery accident; explosion; home fire or chemical leak; overexposure to radiation or toxic chemicals) Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
4. Have you ever lived, worked, or had military service in a war zone? Y or N
a. If yes, were you ever exposed to warfare or combat? (examples: being in the vicinity of a rocket attack or people being fired upon; seeing someone get wounded or killed) Y or N
b. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
5. Have you ever experienced the sudden and unexpected death of a close friend or loved one? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
6. Has a loved one ever survived a life-threatening or permanently disabling accident, assault, or illness? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
7. Have you ever had a life-threatening illness? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
8. Have you ever been robbed or been present during a robbery in which the robber(s) used or displayed a weapon? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
9. Have you ever been hit or beaten up and badly hurt by a stranger or someone that you didn't know very well? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
10. Have you ever seen a stranger (someone that you didn't know very well) attack or beat up someone and seriously injure or kill him or her? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐

TRAUMA EXPOSURE AND HEALTH

11. Has anyone threatened to kill you or cause you serious physical harm? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
b. Was this person a stranger? Y or N
c. Was this person a friend or an acquaintance? Y or N
d. Was this person a relative? Y or N
e. Was this person an intimate partner? Y or N
12. While growing up, were you physically punished in a way that resulted in bruises, burns, cuts, or broken bones? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
13. While growing up, did you see or hear family violence (such as your father hitting your mother, or any family member beating up or inflicting bruises, burns, or cuts on another family member)? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
14. Have you ever been slapped, punched, kicked, or beaten up, or otherwise physically hurt by your spouse (or former spouse), a boyfriend or girlfriend, or some other intimate partner? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
b. Has more than one intimate partner physically hurt you? Y or N
c. If yes, how many hurt you? _____
15. Before your 13th birthday, did anyone who *was at least 5 years older than you* touch or fondle your body in a sexual way or make you touch or fondle his or her body in a sexual way? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
b. Was this person a stranger? Y or N
c. Was this person a friend or acquaintance? Y or N
d. Was this person a parent or caregiver? Y or N
e. Was this person a relative? Y or N
f. Were threats or force used? Y or N
g. Was there oral, anal, or vaginal penetration? Y or N
16. Before your 13th birthday, did anyone *close to your age* touch sexual parts of your body or make you touch sexual parts of his or her body against your will or without your consent? Y or N
a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
b. Was this person a stranger? Y or N
c. Was this person a friend or acquaintance? Y or N
d. Was this person a parent or caregiver? Y or N
e. Was this person a relative? Y or N
f. Were threats or force used? Y or N
g. Was there oral, anal, or vaginal penetration? Y or N

TRAUMA EXPOSURE AND HEALTH

17. After your 13th and before your 18th birthday, did anyone touch sexual parts of your body or make you touch sexual parts of his or her body against your will or without your consent? Y or N

- a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
- b. Was this person a stranger? Y or N
- c. Was this person a friend or acquaintance? Y or N
- d. Was this person a parent or caregiver? Y or N
- e. Was this person a relative? Y or N
- f. Were threats or force used? Y or N
- g. Was there oral, anal, or vaginal penetration? Y or N

18. After your 18th birthday, did anyone touch sexual parts of your body or make you touch sexual parts of his or her body against your will or without your consent? Y or N

- a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
- b. Was this person a stranger? Y or N
- c. Was this person a friend or acquaintance? Y or N
- d. Was this person a parent or caregiver? Y or N
- e. Was this person a relative? Y or N
- f. Were threats or force used? Y or N
- g. Was there oral, anal, or vaginal penetration? Y or N

19. Were you ever subjected to uninvited or unwanted sexual attention other than sexual contact covered by items 15, 16, 17, or 18 (examples: touching, cornering, pressure for sexual favors, verbal remarks? Y or N

- a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
- b. Was this person a stranger? Y or N
- c. Was this person a friend or acquaintance? Y or N
- d. Was this person a relative? Y or N
- e. Were threats or force used? Y or N
- g. Was this person a supervisor or coworker? Y or N

20. Has anyone stalked you (in other words, followed you or kept track of your activities), causing you to feel intimidated or concerned for your safety? Y or N

- a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
- b. Was this person a stranger? Y or N
- c. Was this person a friend or acquaintance? Y or N
- d. Was this person an intimate partner? Y or N
- e. Was this person a relative? Y or N
- f. Were threats or force used? Y or N
- g. Was there oral, anal, or vaginal penetration? Y or N

21. Have you or an intimate partner ever had a miscarriage? Y or N

- a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐
- b. Did it (ever) happen after you were physically injured? Y or N

22. Have you or an intimate partner ever had an abortion? Y or N

- a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐

TRAUMA EXPOSURE AND HEALTH

23. Have you experienced (or seen) any other events that were life threatening, caused serious injury, or were highly disturbing or distressing? (examples: lost in the wilderness, a serious animal bite, violent death of a pet, being kidnapped or held hostage, seeing a mutilated body, burnt body, or body parts) Y or N

a. If yes, how many times? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ More than 5 ☐

b. Please describe:

TRAUMA EXPOSURE AND HEALTH

Appendix B

PTSD Checklist – Civilian Version

Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please read each one carefully, and put an “X” in the box to indicate how much you have been bothered by that problem *in the last month*.

No.	Responses	Not at all (1)	A little bit (2)	Moderately (3)	Quite a bit (4)	Extremely (5)
1.	Repeated, disturbing, <i>memories, thoughts, or images</i> of a stressful experience from the past?					
2.	Repeated, disturbing <i>dreams</i> of a stressful experience from the past?					
3.	Suddenly <i>acting or feeling</i> as if a stressful experience were <i>happening</i> again (as if you were reliving it)?					
4.	Feeling <i>very upset</i> when <i>something reminded</i> you of a stressful experience from the past?					
5.	Having <i>physical reactions</i> (e.g., heart pounding, trouble breathing, or sweating) when <i>something reminded</i> you of a stressful experience from the past?					
6.	Avoid <i>thinking about</i> or <i>talking about</i> a stressful experience from the past or avoid <i>having feelings</i> related to it?					
7.	Avoid <i>activities or situations</i> because they <i>remind you</i> of a stressful experience from the past?					
8.	Trouble <i>remembering important parts</i> of a stressful experience from the past?					
9.	Loss of <i>interest in things that you used to enjoy</i> ?					
10.	Feeling <i>distant or cut off</i> from other people?					
11.	Feeling <i>emotionally numb</i> or being unable to have loving feelings for those close to you?					
12.	Feeling as if your <i>future</i> will somehow be <i>cut short</i> ?					
13.	Trouble <i>falling or staying asleep</i> ?					
14.	Feeling <i>irritable</i> or having <i>angry outburst</i> ?					
15.	Having <i>difficulty concentrating</i> ?					
16.	Being “super alert” or watchful on guard?					
17.	Feeling <i>jumpy</i> or easily startled?					

Appendix C

Inventory of College Students' Recent Life Experiences

Following is a list of experiences which many students have some time or other. Please indicate for each experience how much it has been a part of your life *over the past month*. Put a "1" in the space provided next to an experience if it was *not at all part of your life* over the past month (e.g., "trouble with mother in law – I"); "2" for an experience which was *only slightly* part of your life over that time; "3" for an experience which was *distinctly* part of your life; and "4" for an experience which was *very much* part of your life over the past month.

Intensity of Experience over Past Month

- 1 = *not at all* part of my life
- 2 = *only slightly* part of my life
- 3 = *distinctly* part of my life
- 4 = *very much* part of my life

- | | |
|---|-------|
| 1. Conflicts with boyfriend's/girlfriend's/spouse's family? | _____ |
| 2. Being let down or disappointed by friends | _____ |
| 3. Conflict with professor(s) | _____ |
| 4. Social rejection | _____ |
| 5. Too many things to do at once | _____ |
| 6. Being taken for granted | _____ |
| 7. Financial conflicts with family members | _____ |
| 8. Having your trust betrayed by a friend | _____ |
| 9. Separation from people you care about | _____ |
| 10. Having your contributions overlooked | _____ |
| 11. Struggling to meet your own academic standards | _____ |
| 12. Being taken advantage of | _____ |
| 13. Not enough leisure time | _____ |
| 14. Struggling to meet the academic standards of others | _____ |
| 15. A lot of responsibilities | _____ |
| 16. Dissatisfaction with school | _____ |
| 17. Decisions about intimate relation(s) | _____ |
| 18. Not enough time to meet your obligations | _____ |
| 19. Dissatisfaction with your mathematical ability | _____ |
| 20. Important decisions about your future | _____ |
| 21. Financial burdens | _____ |
| 22. Dissatisfaction with your reading ability | _____ |
| 23. Important decisions about your education | _____ |
| 24. Loneliness | _____ |
| 25. Lower grades than you hoped for | _____ |
| 26. Conflict with teaching assistant(s) | _____ |
| 27. Not enough time for sleep | _____ |
| 28. Conflicts with your family | _____ |
| 29. Heavy demands from extracurricular activities | _____ |
| 30. Finding courses too demanding | _____ |
| 31. Conflicts with friends | _____ |
| 32. Hard effort to get ahead | _____ |

TRAUMA EXPOSURE AND HEALTH

- 33. Poor health of a friend _____
- 34. Disliking your studies _____
- 35. Getting “ripped off” or cheated in the purchase of services _____
- 36. Social conflicts over smoking _____
- 37. Difficulties with transportation _____
- 38. Disliking fellow student(s) _____
- 39. Conflicts with boyfriend/girlfriend/spouse _____
- 40. Dissatisfaction with your ability at written expression _____
- 41. Interruptions of your school work _____
- 42. Social isolation _____
- 43. Long waits to get service (e.g., at banks, stores, etc.) _____
- 44. Being ignored _____
- 45. Dissatisfaction with your physical appearance _____
- 46. Finding course(s) uninteresting _____
- 47. Gossip concerning someone you care about _____
- 48. Failing to get expected job _____
- 49. Dissatisfaction with your athletic skills _____

Appendix D

Acceptance and Action Questionnaire-II

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1. My painful experiences and memories make it difficult for me to live a life that I would value.	1	2	3	4	5	6	7
2. I'm afraid of my feelings.	1	2	3	4	5	6	7
3. I worry about not being able to control my worries and feelings.	1	2	3	4	5	6	7
4. My painful memories prevent me from having a fulfilling life.	1	2	3	4	5	6	7
5. Emotions cause problems in my life.	1	2	3	4	5	6	7
6. It seems like most people are handling their lives better than I am.	1	2	3	4	5	6	7
7. Worries get in the way of my success.	1	2	3	4	5	6	7

TRAUMA EXPOSURE AND HEALTH

Appendix E

RAND 36-Item Short Form Health Survey

Instructions: This set of questions asks for your views about your health. Please answer every question by marking the answer as indicated. If you are unsure about how to answer a question please give the best answer that you can.

1. In general, would you say your health is: (Please tick **one** box.)

- Excellent ☐
- Very Good ☐
- Good ☐
- Fair ☐
- Poor ☐

2. Compared to one year ago, how would you rate your health in general now? (Please tick **one** box.)

- Much better than one year ago ☐
- Somewhat better now than one year ago ☐
- About the same as one year ago ☐
- Somewhat worse now than one year ago ☐
- Much worse than one year ago ☐

3. The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much? (**Please circle one number on each line**)

Activities	Yes, limited a lot	Yes, limited a little	No, not limited at all
a. Vigorous activities , such as running, lifting heavy objects, participating in strenuous sports	1	2	3
b. Moderate activities , such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	1	2	3
c. Lifting or carrying groceries	1	2	3
d. Climbing several flights of stairs	1	2	3
e. Climbing one flight of stairs	1	2	3
f. Bending, kneeling, or stooping	1	2	3
g. Walking more than a mile	1	2	3
h. Walking several blocks	1	2	3
i. Walking one block	1	2	3
j. Bathing or dressing yourself	1	2	3

TRAUMA EXPOSURE AND HEALTH

4. During the past 4 weeks, to what extent has your physical health interfered with your normal social activities with family, friends, neighbors, or groups? (Please tick **one** box.)

- Not at all ☐
 Slightly ☐
 Moderately ☐
 Quite a bit ☐
 Extremely ☐

5. How much physical pain have you had during the past 4 weeks? (Please tick **one** box.)

- None ☐
 Very mild ☐
 Mild ☐
 Moderate ☐
 Severe ☐
 Very Severe ☐

6. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)? (Please tick **one** box.)

- Not at all ☐
 Slightly ☐
 Moderately ☐
 Quite a bit ☐
 Extremely ☐

7. During the past 4 weeks, how much of the time has your physical health interfered with your social activities (like visiting with friends, relatives, etc.)? (Please tick **one** box.)

- All of the time ☐
 Most of the time ☐
 Some of the time ☐
 A little of the time ☐
 None of the time ☐

8.	How TRUE or FALSE is <u>each</u> of the following statements for you?					
(Please circle one number on each line.)		Definitely True	Mostly True	Don't Know	Mostly Not True	Definitely Not True
(a)	I seem to get sick a little easier than other people	1	2	3	4	5
(b)	I am as healthy as anybody I know	1	2	3	4	5
(c)	I expect my health to get worse	1	2	3	4	5
(d)	My health is excellent	1	2	3	4	5

Appendix F

Physical Health Symptoms and Conditions

TRAUMA EXPOSURE AND HEALTH

Instructions: Below is a list of physical health symptoms that some people experience. Please read each symptom and place an **X** in the box as applicable if you have experienced these symptoms in the **PAST SIX MONTHS**. If you placed an X in the box, then indicate how **OFTEN** this has been a problem using the following scale:

- | | |
|-------------------------------------|-----------------------------------|
| 1 = Less than once per month | 4 = Several times per week |
| 2 = Once per month | 5 = Daily or almost daily |
| 3 = Once per week | |

	Problem in the past 6 months? (Put an X if you have had the symptom)	How often in the past 6 months? 1 = Less than once per month 2 = Once per month 3 = Once per week 4 = Several times per week 5 = Daily or almost daily
EAR, NOSE, THROAT		
Vision problems/ blurred vision		
Pain in eyes		
Hearing problems		
Earaches		
Ringing in your ears		
Olfactory (smell) problems		
Colds		
Sinus pain		
Allergies		
Difficulty chewing		
MUSCULOSKELETAL		
Frequent backaches		
Muscle aches in neck, shoulders, or limbs		
Muscle weakness or fatigue		
Muscle twitching or shakiness		
Stiff or aching joints		
Joint swelling		
NEUROLOGICAL		
Headaches		
Migraine headaches		
Dizziness/feeling lightheaded		
Vertigo		
Drowsiness		
Tremors		
Convulsions		
Paralysis		
Problems with short-term memory		
Problems with long-term memory		
Amnesia		
Double vision		
Problems with gait/balance		
CARDIOVASCULAR		

TRAUMA EXPOSURE AND HEALTH

Shortness of breath/Difficulty breathing		
Rapid breathing		
Palpitations (changes in heart rate/rhythm)		
Fatigue		
High blood pressure or Hypertension		
Chest pain		
Numbness or tingling		
Weakness or faintness		
RESPIRATORY		
Stuffy or runny nose		
Cough		
Wheezing cough		
Rapid breathing		
Bronchitis		
Fever		
GASTROINTESTINAL		
Lack of appetite		
Increased appetite		
Difficulty swallowing		
Pain when swallowing or eating		
Pain in abdomen		
Nausea		
Stomach cramps or excessive gas		
Heartburn		
Vomiting		
Diarrhea		
Constipation		
Hemorrhoids		
Hernia		
Rectal bleeding		
GENITOURINARY		
Frequent urination		
Pain with urination		
Vaginal discharge/itching (females)		
Menstrual pain and/or cramping (females)		
Infertility problems		
Low sexual desire (loss of interest in sex)		
Painful intercourse		
Pelvic pain		

Instructions: Below is a list of medical conditions that some people suffer from. Please read each condition, and indicate Y (yes) or N (no) regarding whether or not you have ever had this

TRAUMA EXPOSURE AND HEALTH

condition. If **No**, move on to the next item. If **Yes**, then indicate if it has been a problem in the **PAST SIX MONTHS** by writing Y (yes) or N (no). Additionally, please indicate if this was diagnosed by yourself or a physician by writing S (self) or P (physician).

MEDICAL CONDITION	Have you ever had this condition? Y or N	A problem during the PAST SIX MONTHS? Y or N	Was it diagnosed by yourself or a physician?
Asthma			
Tuberculosis			
Any other trouble breathing (emphysema, chronic bronchitis, brown lung)			
Arthritis, rheumatism, or gout			
High blood sugar or diabetes			
Rheumatic fever or rheumatic heart disease			
Hardening of the arteries or arteriosclerosis			
High blood pressure or hypertension			
A stroke or cerebrovascular accident			
A myocardial infarction or any other heart attack			
Any other heart trouble Specify:			
Problems with blood circulation in arms, legs, or elsewhere			
Cancer of any kind, including leukemia			
A non-cancerous or benign tumor, growth, or cyst			
Liver conditions (hepatitis, cirrhosis)			
Ulcers of the stomach or digestive system			
A digestive disorder other than ulcers or liver problems (gall bladder trouble, stomach or intestinal problems)			
Anemia			
A chronic rash or skin condition (eczema, psoriasis, chloracne, or dermatitis)			
A skin condition such as boils, skin ulcers, or severe burns			
Deafness in one or both ears, or any other serious trouble with hearing			
Blindness in one or both eyes, or any other serious trouble seeing, even when wearing glasses			
Stammering, stuttering, or any other speech impairment			
A kidney, bladder, or urinary tract problem			
Repeated seizures, convulsions, blackouts, or fainting spells (including epilepsy)			
Loss of an organ such as lung, kidney,			

TRAUMA EXPOSURE AND HEALTH

uterus, or breast			
Repeated trouble with your neck, back, or spine			
Permanent stiffness or any deformity of your foot, leg, or back			
Permanent stiffness or any deformity of your fingers, hand, or arm			
Paralysis of any kind			
A concussion or period of being knocked unconscious			
Allergies or inability to take certain medications or eat certain foods			
Tooth loss, gum disease, or other dental problems			
MALES ONLY:			
Prostate trouble			
Inability to achieve an erection			
FEMALES ONLY:			
Painful or irregular menstrual periods, or other trouble with menstruation			
A tumor, cyst, growth, or other disease of the uterus or ovaries			
Vaginal infections such as yeast infection			
Problems that occur monthly just before your menstrual period such as severe abdominal bloating, headache, and breast tenderness			

Appendix G

National College Health Risk Behavior Survey

1. During the past 30 days, on how many days did you smoke cigarettes?

- 1 0 days
- 2 1 or 2 days
- 3 3 to 5 days
- 4 6 to 9 days
- 5 10 to 19 days
- 6 20 to 29 days
- 7 All 30 days

2. During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?

- 1 I did not smoke cigarettes during the past 30 days
- 2 Less than 1 cigarette per day
- 3 1 cigarette per day
- 4 2 to 5 cigarettes per day
- 5 6 to 10 cigarettes per day
- 6 11 to 20 cigarettes per day
- 7 More than 20 cigarettes per day

3. During the past 30 days, how many times did you use marijuana?

- 1 0 times
- 2 1 or 2 times
- 3 3 to 9 times
- 4 10 to 19 times
- 5 20 to 39 times
- 6 40 or more times

4. During your life, how many times have you used any form of cocaine, including powder, crack, or freebase?

- 1 0 times
- 2 1 or 2 times
- 3 3 to 9 times
- 4 10 to 19 times
- 5 20 to 39 times
- 6 40 to 99 times
- 7 100 or more times

TRAUMA EXPOSURE AND HEALTH

5. During your life, how many times have you sniffed glue, or breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?

- 1 0 times
- 2 1 or 2 times
- 3 3 to 9 times
- 4 10 to 19 times
- 5 20 to 39 times
- 6 40 to 99 times
- 7 100 or more times

6. During your life, how many times have you taken steroid pills or shots without a doctor's prescription?

- 1 0 times
- 2 1 or 2 times
- 3 3 to 9 times
- 4 10 to 19 times
- 5 20 to 39 times
- 6 40 to 99 times
- 7 100 or more times

7. During your life, how many times have you used any other type of illegal drug, such as LSD, PCP, ecstasy, speed, ice, or heroin?

- 1 0 times
- 2 1 or 2 times
- 3 3 to 9 times
- 4 10 to 19 times
- 5 20 to 39 times
- 6 40 to 99 times
- 7 100 or more times

8. During the past 30 days, how many times have you used any illegal drug in combination with drinking alcohol?

- 1 0 times
- 2 1 or 2 times
- 3 3 to 9 times
- 4 10 to 19 times
- 5 20 to 39 times
- 6 40 or more times

TRAUMA EXPOSURE AND HEALTH

9. During your life, with how many females have you had sexual intercourse?

- 1 I have never had sexual intercourse with a female
- 2 1 female
- 3 2 females
- 4 3 females
- 5 4 females
- 6 5 females
- 7 6 or more females

10. During the past 3 months, with how many females have you had sexual intercourse?

- 1 I have never had sexual intercourse with a female
- 2 I have had sexual intercourse with a female, but not during the past 3 months
- 3 1 female
- 4 2 females
- 5 3 females
- 6 4 females
- 7 5 females
- 8 6 or more females

11. During your life, with how many males have you had sexual intercourse?

- 1 I have never had sexual intercourse with a male
- 2 1 male
- 3 2 males
- 4 3 males
- 5 4 males
- 6 5 males
- 7 6 or more males

12. During the past 3 months, with how many males have you had sexual intercourse?

- 1 I have never had sexual intercourse with a male
- 2 I have had sexual intercourse with a male, but not during the past 3 months
- 3 1 male
- 4 2 males
- 5 3 males
- 6 4 males
- 7 5 males
- 8 6 or more males

TRAUMA EXPOSURE AND HEALTH

13. During the past 30 days, how many times did you have sexual intercourse?

- 1 0 times
- 2 1 time
- 3 2 or 3 times
- 4 4 to 9 times
- 5 10 to 19 times
- 6 20 or more times

14. During the past 30 days, how often did you or your partner use a condom?

- 1 I have not had sexual intercourse during the past 30 days
- 2 Never used a condom
- 3 Rarely used a condom
- 4 Sometimes used a condom
- 5 Most of the time used a condom
- 6 Always used a condom

15. The last time you had sexual intercourse, did you or your partner use a condom?

- 1 I have never had sexual intercourse
- 2 Yes
- 3 No

16. Did you drink alcohol or use drugs before you had sexual intercourse the last time?

- 1 I have never had sexual intercourse
- 2 Yes
- 3 No

17. Yesterday, how many times did you eat fruit?

- 1 0 times
- 2 1 time
- 3 2 times
- 4 3 or more times

18. Yesterday, how many times did you drink fruit juice?

- 1 0 times
- 2 1 time
- 3 2 times
- 4 3 or more times

TRAUMA EXPOSURE AND HEALTH

19. Yesterday, how many times did you eat green salad?

- 1 0 times
- 2 1 time
- 3 2 times
- 4 3 or more times

20. Yesterday, how many times did you eat cooked vegetables?

- 1 0 times
- 2 1 time
- 3 2 times
- 4 3 or more times

21. On how many of the past 7 days did you exercise or participate in sports activities for at least 20 minutes that made you sweat and breathe hard, such as basketball, jogging, swimming laps, tennis, fast bicycling, or similar aerobic activities?

- 1 0 days
- 2 1 day
- 3 2 days
- 4 3 days
- 5 4 days
- 6 5 days
- 7 6 days
- 8 7 days

22. On how many of the past 7 days did you do stretching exercises, such as toe touching, knee bending, or leg stretching?

- 1 0 days
- 2 1 day
- 3 2 days
- 4 3 days
- 5 4 days
- 6 5 days
- 7 6 days
- 8 7 days

TRAUMA EXPOSURE AND HEALTH

23. On how many of the past 7 days did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?

- 1 0 days
- 2 1 day
- 3 2 days
- 4 3 days
- 5 4 days
- 6 5 days
- 7 6 days
- 8 7 days

24. On how many of the past 7 did you walk or bicycle for at least 30 minutes at a time?
(Include walking or bicycling to or from class or work)

- 1 0 days
- 2 1 day
- 3 2 days
- 4 3 days
- 5 4 days
- 6 5 days
- 7 6 days
- 8 7 days

Appendix H

Alcohol Use Disorders Identification Test

Please circle the answer that is correct for you

1. How often do you have a drink containing alcohol?

- Never
- Monthly or less
- 2-4 times a month
- 2-3 times a week
- 4 or more times a week

2. How many standard drinks containing alcohol do you have on a typical day when drinking?

- 1 or 2
- 3 or 4
- 5 or 6
- 7 to 9
- 10 or more

3. How often do you have six or more drinks on one occasion?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

4. How often during the last year have you found that you were not able to stop drinking once you had started?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

TRAUMA EXPOSURE AND HEALTH

5. How often during the last year have you failed to do what was normally expected of you because of drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

6. How often during the last year have you needed a drink in the morning to get yourself going after a night of heavy drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

7. How often during the last year have you had a feeling of guilt or remorse after drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because of your drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

- No
- Yes, but not in the past year
- Yes, during the past year

TRAUMA EXPOSURE AND HEALTH

10. Has a relative or friend, doctor, or other health professional expressed concern about your drinking or suggested you cut down?

- No
- Yes, but not in the past year
- Yes, during the past year

Appendix I

Demographics Questionnaire

Sex/Gender:

- ☐ Female
- ☐ Male
- ☐ Transgender

Race/Ethnicity:

- ☐ African American/Black
- ☐ Asian/Pacific Islander
- ☐ Hispanic/Latino
- ☐ Multiracial
- ☐ Native American/American Indian
- ☐ White
- ☐ Not listed (please specify)

- ☐ Prefer not to respond

Class status:

- ☐ Freshman
- ☐ Sophomore
- ☐ Junior
- ☐ Senior
- ☐ Other

Enrollment this term:

- ☐ Full-time student
- ☐ Part-time student

Age: _____

Height: _____ feet _____ inches

Weight (best estimate): _____ pounds

Marital status:

- ☐ Single, never married
- ☐ Married or domestic partnership
- ☐ Widowed
- ☐ Divorced
- ☐ Separated

TRAUMA EXPOSURE AND HEALTH

How many hours do you work for pay?

- ☐ None
☐ 1-10 hours/week
☐ 11-20 hours/week
☐ 21-30 hours/week
☐ More than 30 hours/week

Do you consider yourself to be a:	Yes	No
• International student	<input type="checkbox"/>	<input type="checkbox"/>
• Veteran	<input type="checkbox"/>	<input type="checkbox"/>
• NCAA athlete	<input type="checkbox"/>	<input type="checkbox"/>
• Social fraternity or sorority member	<input type="checkbox"/>	<input type="checkbox"/>

Which best describes where you currently live?

- ☐ Dormitory or residence hall
☐ Fraternity/Sorority housing
☐ Other university housing
☐ Off-campus housing
☐ Parent/guardian's home

What is the highest level of formal education attained by your parents?

Mark one in each column

Mother

Father

Did not finish high school		
High school diploma or G.E.D.		
Postsecondary school other than college		
Some college		
College degree		
Some graduate school		
Graduate degree		

What do you think your family's yearly income was growing up?

- ☐ \$15,000 or less
☐ \$15,001 – \$25,000
☐ \$25,001 – \$35,000
☐ \$35,001 – \$50,000
☐ over \$50,000

To your knowledge, was either of your parents ever diagnosed with a mental health disorder (e.g., anxiety disorder, depression)?

☐ Yes ☐ No

Do you have some form of health insurance coverage?

☐ Yes ☐ No

TRAUMA EXPOSURE AND HEALTH

Approximately how many times have you visited IUP Health Service, a physician, emergency room, or other health facility in the past six months? _____times

Have you ever been diagnosed with a mental health disorder (e.g., anxiety disorder, depression)? __Yes __No

Appendix J

Informed Consent Form

Primary Investigator:

Kate Sowder, M.A.
Clinical Psychology Doctoral Candidate
Indiana University of Pennsylvania
Psychology Department, Uhler Hall
1020 Oakland Ave., Indiana, PA
Email: k.l.sowder@iup.edu

Faculty Sponsor:

Laura Knight, Ph.D.
Assistant Professor
Indiana University of Pennsylvania
Psychology Department, Uhler Hall
1020 Oakland Ave., Indiana, PA
Email: laura.knight@iup.edu

Source of support: This study does not receive financial support from any organization.

Study description:

You are invited to participate in this research study. The following information is provided in order to help you make an informed decision whether or not to participate. If you have any questions, please do not hesitate to contact one of the investigators. You are eligible to participate because you are a student at least 18 years of age who may have experienced exposure to a potentially stressful event.

The purpose of this study is to examine relationships between stressful life events, lifestyle choices, and health. Participation in this study will require approximately 60 minutes of your time and is not considered a part of any psychological treatment. If you choose to participate in this study, you will be asked to complete an online, anonymous survey consisting of several questionnaires asking basic information about yourself (demographics), stressful life events, lifestyle choices, and health.

Risks and Benefits:

There is no known risk for lasting discomfort associated with this research. You may temporarily feel some distress in recalling events that you have experienced. However, you may find participation to be a valuable experience, as many individuals participating in similar research value their participation after having learned to disclose such meaningful personal information. The information gathered in this study may help us to better understand the ways in which stressful or traumatic life events can lead to different outcomes. In the event that you become unduly distressed by your participation in this study, please inform the primary investigator or faculty sponsor, whose contact information is listed at the top of this page. You may choose to request therapy services at IUP Counseling Center.

TRAUMA EXPOSURE AND HEALTH

Compensation:

You will receive credit toward the research requirement in your General Psychology class for participating in this study. If you choose not to participate then you can satisfy this requirement by reading and reviewing a research article for class.

Confidentiality:

If you choose to participate, all information will be held in strict confidence. Your responses will be considered only in combination with those from other participants. The information obtained in the study may be published in scientific journals or presented at scientific meetings, but your individual identity will be kept strictly confidential.

Right to withdraw:

Your participation in this study is **voluntary**. If you choose to participate, you may withdraw at any time by closing the internet browser. Upon your withdrawal, your incomplete survey responses will not be included in this study. If you are willing to participate, please click “Yes” below. If you choose not to participate, please click “No” and refer to your professor for a read-and-review assignment.

I have read and understand the information in this form and I consent to be a volunteer participant in this study. I understand that my responses are completely confidential and that I have the right to withdraw at any time. I am aware that I may print a copy of this informed Consent Form to keep in my possession.

_____ yes

_____ no

Appendix K

Debriefing Form

Thank you for participating in this study. By doing so, you are helping us understand the relationship between trauma, health, and avoidance. This may contribute to the knowledge base needed to create better prevention or intervention programs for students who have experienced traumatic events.

We are specifically investigating the health effects of exposure to traumatic events. Many people experience negative effects on their physical health or develop poor health habits after experiencing a traumatic event. We are particularly interested in why these outcomes occur. We are examining whether people who avoid thinking distressing thoughts or having upsetting emotions have more negative health outcomes.

If you are interested in receiving a summary of the results of this study, please contact the primary investigator, Kate Sowder, M.A., at k.l.sowder@iup.edu, or the faculty member supervising this study, Dr. Laura Knight, at laura.knight@iup.edu. This research project is sponsored by the Indiana University of Pennsylvania Department of Psychology and has been approved by the Internal Review Board at IUP.

You may find that answering the questions for this study has left you with strong emotions or thoughts. These are normal experiences. If you would like to talk to someone about the events you discussed or about your reactions to participation in this study, you may contact Dr. Knight at (724) 357-4526, or ask the primary investigator to contact Dr. Knight if it is after hours. You may also contact any of the mental health resources listed below. Each is free for students.

For further information

Felitti, V., J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., . . . Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *American journal of preventive medicine*, 14(4), 245-258.

Referral List

IUP Counseling Center: (724) 357-2621

The IUP Counseling Center assists students in fostering self-knowledge and skills necessary to succeed personally, academically, and professionally. The staff includes licensed psychologists and advanced doctoral student counselors. Individual or group counseling is available to assist students by exploring goals and concerns in a comfortable, private, non-judgmental setting.

TRAUMA EXPOSURE AND HEALTH

IUP Center for Applied Psychology (724) 357-6228

The IUP Center for Applied Psychology provides psychological services to the community. Doctoral students in advanced training provide services and are supervised by an IUP faculty member who is a licensed psychologist. Individual, family, and couples therapy and assessment services are available for individuals with a wide variety of issues.

The Haven Project at Alice Paul House (24/7 hotline): 800-435-7249

The Haven Project is designed to increase and improve counseling and advocacy services for students who experience violence. The Haven Project also offers prevention education about stalking, dating/relationship violence, and sexual assault.

Alice Paul House (24/7 hotline) – 724-349-4444

Shelter is provided to victims of crime, their dependent children, other family, and friends. Individual and group counseling is provided to victims of domestic violence, sexual assault, and other violent crime. Advocacy and accompaniment is provided to all victims of crime. Assistance is offered to victims seeking crime victim compensation.

Health AWAREness – 724-357-4799

The Health AWAREness program encourages students to make healthy lifestyle choices, advocates for a campus community that supports students' well-being, and provides intervention and referrals to meet students' health needs. Through peer education programs and AWAREness campaigns, students can learn how to develop lifestyles that promote lifelong wellness.

University Police – 724-357-2141

The Office of Public Safety oversees the University Police and Campus Safety offices. The Public Safety Office is responsible for protecting public safety, enforcing student behavior regulations, and investigating crimes that occur on the IUP campus. People who wish to report a crime or who would like more information about the services provided can come to the office or telephone them.

Crisis Intervention Hotline – 1-877-333-2470

Trained Crisis Intervention Specialists are available to listen, helping you problem solve your crisis and provide valuable referrals for further assistance in the areas of suicide, alcohol and other drug abuse, mental health, grief and loss, domestic violence or rape, or any crisis in your life. They offer unconditional positive regard toward all of their contacts, respecting the difficulty in your decision to contact them and thanking you for the opportunity to help you.