Factors Affecting the Relationship Between Trauma and Illness Behavior

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(ABSTRACT)

Associations between the experience of traumatic events and illness behaviors such as health complaints and healthcare use are reported in recent studies. Posttraumatic Stress Disorder (PTSD) symptoms and diagnosis have been found to mediate this trauma-illness relationship. Differences in health behaviors have additionally been noted in the literature, with trauma victims engaging in more negative health behaviors, which may subsequently affect illness status. Further, illness behaviors such as somatic complaints and health care utilization are influenced by modeling and reinforcement of such behaviors. The current study sought to evaluate the contributions of negative health behaviors, illness-related learning history, and PTSD symptoms on trauma victims' health complaints, functional health status, and utilization of healthcare services.

The final sample included 298 undergraduate students at a large southeastern university. Participants provided information about their trauma histories, health behaviors, illness-related learning history and current illness behaviors on group-administered self-report questionnaires. Consent to obtain utilization information from the university health center was also obtained. Hierarchical regression analyses were used to assess the additive contributions of the predictor variables.

The results indicated that health complaints, functional health status, and utilization behavior are each influenced by trauma history, with more illness behavior associated with greater trauma severity. In addition, health behaviors, illness-related learning history and PTSD symptoms all contribute to the prediction of health complaints and functional health status. Utilization behavior, however, was predicted only by trauma history and learning history. Further, the different types of learning history (modeling, reinforcement, priming) appear to affect different illness behaviors. Implications of the study are discussed.

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Factors Affecting the Relationship Between Trauma and Illness Behavior

Numerous studies have demonstrated a relationship between the experience of traumatic events and illness outcomes, including victims' reports of elevated physical symptoms, poorer ratings of global health, and increased health care utilization (see Resnick, Acierno, & Kilpatrick, 1997 for a review). The International Consensus Group on Depression and Anxiety recently concluded that "the relationship between trauma, poor health, and overutilization of the health system is well established…What requires further research is whether this relationship is mediated by PTSD [Posttraumatic Stress Disorder] or other factors." (Ballenger et al., 2000, p. 62). Several researchers have reported data that supports the notion that clinically significant levels of distress, and particularly PTSD symptoms, largely account for the relationship between trauma and health complaints (Wolfe, Schnurr, Brown, & Furey, 1994; Friedman & Schnurr, 1995; McFarlane, Atchison, Rafalowicz, & Papay, 1994; Kimerling, Clum, & Wolfe, 2000; and Wagner, Wolfe, Rotnitsky, Proctor, & Erickson, 2000). These findings suggest that psychophysiological responses to the traumatic event are associated with differences in health indices above and beyond exposure to a traumatic event. This is an important distinction as it suggests that individual characteristics and responses to the event, rather than elements of the event itself, determine a person's post-traumatic symptom pathway. While there may be negative physical health consequences intrinsic to a traumatic event (for example, injury in an motor vehicle accident, the inhalation of toxins during a fire, etc.), the implication of a mediational role of PTSD is that the psychological factors (for example, appraisal of the event, coping abilities, etc.) are critical in determining long term health outcomes.

Epidemiological data further support the importance of the individual's response to traumatic events. These data indicate that, while a majority of the population will encounter a

traumatic event during their life (approximately 51-69%; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Norris, 1992; Resnick et al., 1993), only about one third of those experiencing traumatic events meet criteria for PTSD in their lifetime (Breslau, Davis, Andreski & Peterson, 1991; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). The development of PTSD has been associated with the severity of the event, as indicated by the person's response at the time of the event. More extreme peritraumatic responses are associated with worse post-traumatic outcomes (Roemer, Orsillo, Borkovec, & Litz, 1998). A mediational role of PTSD symptoms between traumatic events and illness outcomes has been found repeatedly. It is notable, however, that the experience of traumatic events is not synonymous with either the development of PTSD or increased health complaints. Other variables must, therefore, be considered in explaining the trauma-health relationship. As indicated above, it is the psychological response to the event and coping behaviors employed to manage that response that likely play a critical role in the person's health status after a traumatic event.

The current study sought to evaluate the role of several psychosocial variables that may help to explain both the development of PTSD symptoms and increased illness behaviors (somatic complaints, functional health status, and health care utilization) following traumatic events. One pathway explored in the current study is the influence of a family system that encourages individuals to attend to and report symptoms, potentially resulting in increased complaints in both the psychological and physical health domains. In the face of a traumatic event, such an individual may employ this learned response of self-assessment and attention to symptoms (Mullins & Olson, 1990). The impact of illness-related social learning history on the trauma-health relationship was therefore investigated. In addition, increased negative health behaviors (for example, increased alcohol intake and smoking) have been associated with

experiencing trauma (Acierno, Kilpatrick, Resnick & Saunders, 1996; Dansky, Brady, Kilpatrick & Resnick, 1995; Dansky, Brewerton, Kilpatrick, & O'Neil, 1997). Since negative health behaviors have been linked to physical health problems (Centers for Disease Control [CDC], 2002), individuals with a trauma history could be at greater risk for physical symptoms related to illness as a result of unhealthy lifestyles. Accordingly, the present study examined the mediating role of PTSD symptoms, social learning history, and negative health behaviors on the relationship between trauma and illness outcomes. This study also examined the independent contribution of these factors in predicting illness outcomes.

The Relationship Between Trauma and Illness

Research on the trauma-health relationship has primarily assessed health care utilization behavior and self-reported health complaints as indicators of illness. Both of these outcome measures are associated with a history of traumatic experience. Further, possible mediators of the trauma-illness relationship, specifically symptoms of PTSD and depression, have been examined.

The experience of traumatic events has been associated with significant increases in health care utilization. Utilization indicators that are positively associated with trauma in studies of assaulted women include number of telephone contacts to a medical facility, physician visits, ongoing and acute prescriptions, and specialist referrals (Beckham, Moore, Feldman, Hertzberg, Kirby, & Fairbank, 1998; Waigandt, Wallace, Phelps, & Miller, 1990; Koss, Woodruff, & Koss, 1990; Koss, Koss, & Woodruff, 1991; Bergman & Brismar, 1991; Bergman, Brismar & Nordin, 1992; Sansone, Weiderman, & Sansone, 1997). Koss and colleagues (1991) estimate that severely victimized women had outpatient costs 2.5 times greater than non-victims. While most studies have focused on sexual crimes, the research reported by Koss and colleagues additionally

included robbery (attempted and completed), illegal entry of home, and physical assault. Exposure to combat has also been associated with increased physician visits (Schnurr, Friedman, Sengupta, Jankowski, & Holmes, 2000; Marshall, Jorm, Grayson, & O'Toole, 1998). The data suggest, therefore, that the type of traumatic event is not critical to the prediction of healthcare use.

Increased healthcare utilization has additionally been associated with a PTSD diagnosis. The diagnostic criteria for PTSD consist of three symptoms clusters: intrusion of images, thoughts or dreams about the event, avoidance of the situation or things that remind the individual of the event, and increased physiological arousal (American Psychiatric Association [APA], 1994). In a case comparison design study evaluating high vs. low users of Veterans Administration healthcare services, Deykin and colleagues (Deykin et al, 2001) found that high users of healthcare were almost twice as likely to meet criteria for PTSD diagnosis at the time of assessment. Path analyses indicated that physician-diagnosed health conditions mediated the relationship between PTSD and utilization. Australian combat veterans diagnosed with PTSD also had increased health care use as well as more physical diagnoses than those veterans who did not develop PTSD (Marshall et al., 1998). Similarly, firefighters, who had experienced a major fire and developed PTSD were more likely to have seen their physician after the trauma than those who did not develop PTSD (McFarlane, Atchison, Rafalowicz, & Papay, 1994). A study with American veterans, however, failed to find an association between PTSD and health care utilization (Hankin, Abueg, Gallagher-Thompson, & Laws, 1996). One difference that may explain the discrepant results is that Hankin and colleagues used lifetime PTSD diagnosis (i.e., an assessment of whether the participants met criteria for PTSD at *any* point in their lifetime) rather than current diagnosis. This approach is less likely to yield an association with current

utilization behavior (usually defined as previous 6-12 months) because it is less proximal to the behavior of interest. Overall, therefore, the weight of the research points to a positive relationship between PTSD and healthcare utilization. The increased healthcare use in these studies was, again, not specific to type of traumatic event. Rather, the development of post-traumatic symptomatology was common to these studies, implying that the details of the event are not significant to the likelihood that a person will seek services but the individual's subjective experience and subsequent response to the event are critical.

Further support for the relationship between trauma and health comes from studies that examined health complaints in a target traumatized population. Combat veterans report more pain, dermatologic, gastrointestinal, ophthalmologic, endocrinologic, gynecologic, nervous system and cardiovascular problems as well as increased incidence of infectious diseases (Wolfe et al., 1994; Friedman & Schnurr, 1995; Boscarino, 1997). Similar increases in health complaints have been observed in victims of interpersonal violence (Koss et al., 1990; Waigandt et al., 1990; Golding, 1994; McCauley et al., 1995; Felitti, et al., 1998; Leserman, Li, Hu, & Drossman, 1998) and natural disasters (Phifer, 1990; Escobar, Canino, Rubio-Stipec, & Bravo, 1992; McFarlane et al., 1994). In order to directly test the proposal that it is not the characteristics of the traumatic event itself but the person's cognitive, emotional, and behavioral response to the event that predicts health-related changes, mediational models have been used to assess the statistical relationships among traumatic events, PTSD, and health complaints. As mentioned previously, in these models PTSD symptoms are found to fully account for the relationship between trauma and health complaints (Wolfe et al., 1994; Friedman & Schnurr , 1995; McFarlane et al., 1994; Kimerling et al., 2000; Wagner et al., 2000).

Depression is also a common response to traumatic events (Burnam, Stein, Golding & Seigel, 1988; Clum, Calhoun, & Kimerling, 2000) and is highly comorbid with PTSD (Kessler, Sonnega, Bromet, Hughes & Nelson, 1995; Green, Lindy, Grace, & Leonard,1992; Keane & Wolfe, 1990). If a person's response to the traumatic event is critical to physical health outcomes, depressive symptoms alone might account for changes in health status that have been attributed to PTSD. While depression is consistently predictive of health complaints (Kirmayer, & Robbins, 1996; Lipowski, 1990), PTSD symptoms emerge as a significant predictor of self-reported health even after controlling for the effects of depression (Deykin et al., 2001; Clum et al., 2000). These studies demonstrate both that post-traumatic psychiatric symptomatology in general is closely related to somatic complaints and that the development of PTSD symptoms has an unique association to illness outcomes.

One hypothesis about the mediational role of PTSD symptoms is that biological mechanisms explain the impact of PTSD on health (Friedman & Schnurr, 1995). Cardiovascular reactivity, autonomic reactivity, adrenergic dysregulation, and hypothalamic-pituitary-adrenal (HPA) axis alterations are among other changes associated with PTSD that may affect physical health. Chronic hyperarousal has been frequently identified as a potential mechanism (Koss & Heslet, 1992; McFarlane et al., 1994) and has received further support from the report by Kimerling and colleagues that hyperarousal symptoms of PTSD were more strongly associated with total health symptoms and health perception than the symptoms of intrusion or avoidance (Kimerling et al., 2000).

Alternatively, Resnick et al. (1997) proposed a model in which physical symptoms experienced at the time of a traumatic event become conditioned responses (through trauma cues) that impact illness perceptions and functional health status. Those individuals who

continue to exhibit posttraumatic symptoms may also have developed a stronger conditioned pathway and would be expected to report more health complaints.

Health Behaviors

In addition to symptoms of PTSD and depression, changes in health behaviors a re often observed after traumatic events. The Centers for Disease Control (CDC, 2002) reviewed evidence that health behaviors have a significant impact on physical health, illness, and healthcare utilization. Women with PTSD symptoms often have poorer health habits and deficits in self-care such as excessive smoking or substance abuse (Acierno, et al., 1996; Dansky et al., 1995; Dansky et al., 1997). Similarly, Solomon & Mikulincer (1987) found that PTSD symptoms were associated with increases in smoking and alcohol consumption in a follow-up study of Israeli combat veterans. Beckham and colleagues (Beckham, 1997; Beckham, Moore, Feldman, Hertzberg, Kirby, & Fairbank, 1998) suggested a close link between trauma history and health behaviors when they reported that smokers reported a high frequency of smoking in response to military memories.

Shalev, Bleich, and Ursano (1990) additionally found more severely obese and underweight individuals in a group of Israeli combat veterans who were diagnosed with PTSD compared to controls. Further, while the two groups reported the same level of physical activity, the PTSD group reported more effort symptoms associated with this activity. Felitti et al. (1998) similarly found decreased physical activity and severe obesity in traumatized groups.

There is evidence that these changes in health behaviors may occur in response to post-traumatic psychiatric symptoms, contribute to the development of these symptoms, and maintain symptoms once they have developed (Acierno et al, 2000; Beckham et al., 1997). The presence of these negative changes in health behavior after traumatic events provides one possible

explanation for why traumatized individuals report more illness and use more healthcare services. Schnurr and Spiro (1999) evaluated the effects of combat exposure, posttraumatic stress disorder (PTSD) symptoms, and health behaviors on physical health. Combat exposure and PTSD were both correlated with poorer health and combat exposure had only an indirect effect on health status, with PTSD mediating the relationship. Smoking was significantly associated with health status but did not mediate the effects of PTSD. In this study, alcohol was unrelated to health status.

There is preliminary evidence, therefore, that trauma and PTSD are related to differences in health behaviors. Further, the research of Schnurr and Spiro (1999) implies that PTSD continues to affect illness above and beyond health behaviors.

Symptom Reporting and Learning History

As indicated previously, only a subset of individuals who experience traumatic events develop PTSD and have increased health problems. Research indicating that PTSD mediates the trauma-health relationship relies on self-reports of both psychological and physical health sequelae. A possible explanation of these relationships is that the experience of a traumatic event results in a stress response that is behaviorally manifested in some individuals as increased symptom reporting. This subset of people may have been raised in a family environment that fostered self-monitoring and reporting of symptoms. The predisposition to report more symptoms under stress could have developed in families that modeled, prompted and reinforced such behavior.

Whitehead and colleagues (Whitehead, Morrison & Crowell, 1992) have used social learning principles to develop scales retrospectively measuring childhood reinforcement and modeling of illness behavior. Their measure assessed reinforcement of menstrual, bowel, and

cold symptoms and modeling of menstrual and bowel symptoms by parents. When used to predict adult symptoms, Whitehead and colleagues (Whitehead, Crowell, Heller, Robinson, Schuster, & Horn, 1994) found that childhood reinforcement of cold and menstrual symptoms predicted adult symptoms, but that bowel symptoms were not predicted.

Schwarz, Gramling, and Mancini (1994) also report that social learning variables increase health complaints. They assessed for a history of parent modeling and current reinforcement of illness-related behaviors and found that these variables predicted health complaints (not specified by illness category) above and beyond demographic variables, current stressors, and general illness attitudes. The contribution of social learning variables to medical utilization (as measured by 6-month physician visits) was not significant in this study, which suggests that complaining behavior and utilization behavior may be driven by different factors.

The above studies support a connection between illness-related learning history and current health complaints. The question remains, however, whether a learning history accounts for the relationship between PTSD symptoms and health complaints. In essence, social learning history could explain increases in both physical and psychological symptom complaints as a proclivity to report symptoms. Such a learned proclivity is implied by the finding that children with unexplained abdominal pain are more likely to have parents with higher overall levels of somatization, not necessarily just parents who also complain of abdominal pain (see Janicke & Finney, 1999 for review). In contrast, when looking at adult illness behaviors in the context of retrospective evaluations of childhood learning environment, social learning appears to be specific to illness category rather than generalizing to different types of complaints. Specifically, Whitehead and colleagues found that childhood reinforcement and modeling of cold symptoms predicted adult reporting of cold symptoms, but not adult menstrual or bowel symptoms

(Whitehead et al., 1994). Similarly, childhood reinforcement and modeling of menstrual symptoms predicted adult menstrual symptoms and menstrual-related physician visits, but not cold or bowel symptoms. Childhood reinforcement and modeling of bowel symptoms, however, did not predict any of the three adult illness symptoms categories.

Reasons for the discrepancy between childhood and adult generalization of illness-related learning are unclear and, to date, unreplicated. Further, these studies are limited in that the measure of social learning was restricted to positive and negative reinforcement for illness behavior and parental modeling, but did not assess the role of priming the individual to attend to their health status. Priming is an important component of learning history because associations made at an earlier time can affect current thoughts and/or behavior without conscious awareness. Bargh (1994) calls this sort of trigger in response to a representative stimulus in the environment "preconscious automaticity" and goes on to say that certain constructs and categorizations that fall under this heading are always prominent in the mind ready to be activated. With regard to health, some children may be primed to more closely monitor their health by having parents voice frequent inquiries about their health status or health directed concerns such as being told to wash their hands to avoid germs. The increased physical arousal after a traumatic event may serve as a trigger that automatically activates health-monitoring cognitions. To date, no study has examined whether social learning history and health behaviors can account for the relationship between trauma and health status and whether their explanatory value is incremental to that offered by the presence of PTSD symptoms.

A second limitation of the previously described studies is that utilization was defined only by physician visits. The current research assesses a number of health care utilization variables (visits, phone contacts, prescriptions, specialist referrals) for a more complete

evaluation of utilization behavior and it's relationship to family learning environment and trauma history.

The Present Study

The overarching goal of the current research was to investigate factors that affect the relationship between trauma and health. As described previously, significant positive associations between traumatic events and various illness behaviors (health complaints, functional health status, healthcare utilization) have been found in numerous studies and with different types of trauma experience and these associations are mediated by PTSD symptoms. The current study proposed to use a series of hierarchical regression analyses to systematically assess competing hypotheses to this PTSD-mediational model. Specifically, health behaviors and illness-related learning history were expected to mediate the relationship between trauma and illness behavior. In addition, PTSD symptomatology was expected to predict illness behavior independently of health behaviors and illness-related social learning history.

Hypotheses

The current study sought to assess the contribution of illness learning history, health behaviors, and PTSD symptoms to the prediction of illness behaviors after traumatic events. Specifically, the following hypotheses were proposed:

1. Severity of traumatic events will be associated with PTSD symptomatology.

2. Severity of traumatic events will be associated with more illness behavior as manifested by more health complaints, worsened functional health status, and increased healthcare utilization.

3. PTSD symptomatology will mediate the association between traumatic events and illness behaviors.

4. Trauma severity will be associated with higher levels of health behaviors that have a negative health impact (more smoking, more alcohol consumption, more obesity) and lower levels of health behaviors that have a positive health impact (less exercise).

5. Health behaviors and PTSD will each uniquely add to the prediction of illness behaviors (health complaints, functional health status, healthcare utilization) above and beyond trauma severity. (Figure 1)

6. Illness related learning history (reinforcement, modeling, priming) will be associated with higher levels of illness behaviors (health complaints, functional health status, healthcare utilization). (Figure 2)

7. Illness related learning history will be associated with higher levels of PTSD symptomatology, controlling for trauma severity. (Figure 2)

8. Illness related learning history and PTSD symptomatology will each uniquely add to the prediction of illness behaviors above and beyond trauma severity. (Figure 3)

9. PTSD symptomatology will add to the prediction of illness behavior above and beyond trauma severity, health behaviors, and illness-related learning history.

Method

Participants

Three hundred fourteen participants were recruited from the Introductory Psychology participant pool at Virginia Polytechnic Institute and State University. Participants who provided substantial incomplete data or whose responses were incongruent with the response format (several incidents of responding to questionnaires with values outside the range of the scale) were excluded. The final dataset included 298 individuals. No other exclusion criteria were employed.

Table 1 presents information relating to the demographics of the sample. The sample consisted of 121 men (40.6%) and 177 women (59.4%). As expected, the sample is limited in racial diversity, age, and marital status, reflecting the composition of the university population. The majority of the sample was Caucasian (79.9%), 10.4% were Asian or Pacific Islander, 5.7% were African-American, 1.7% were Hispanic, and 2.7% identified as Bi/Multicultural or other. The mean age of the sample was 19.3 years and 98.1% of the sample was age 18-22 years. Most of the sample was single (97%), 1 individual was married (.3%), 1 individual was divorced (.3%), and 7 (2.4%) identified their marital status as "other" and indicated that they were engaged. All of the participants were undergraduates, 52% of whom were 1st years students, 31.2% were 2nd year students, 12.1% were 3rd year students, 3.0% were fourth years, and 1.7% had been enrolled for five or more years.

Predictor Measures

Demographic Questionnaire

This questionnaire was designed for the current study and assessed general demographic characteristics of the participants including sex, age, race, marital status, and educational level.

Traumatic Events Questionnaire (TEQ) (Vrana & Lauterbach, 1994)

The TEQ (Vrana & Lauterbach, 1994) was used to assess experiences with 9 specific types of traumatic events (accidents, natural disasters, crime, child abuse, rape, adult abusive experiences, witnessing the death/mutilation of someone, being in a dangerous/life threatening situation, receiving news of the unexpected or sudden death of a loved one). In addition, two categories that allow respondents to report any other "very traumatic event" not listed and events that are so traumatic that they cannot discuss them are included in the measure. Participants indicated the number of times they experienced each event and provided further information about each type of event that they had experienced. Pertinent for the current study, participants rated the perceived severity of each trauma at the time of the event on a 7-point scale anchored by "not at all" and "extremely." Participants who experienced multiple events further indicated which of their experiences was the most traumatic and were instructed to consider the impact of that event when completing the PTSD symptom assessment (PPTSD-R). The severity rating for the event rated as most traumatic was used as the trauma variable in the analyses.

Purdue PTSD Scale-Revised (PPTSD-R) (Lauterbach & Vrana, 1996)

The PPTSD -R (Lauterbach & Vrana, 1996) is a 17-item scale that assesses symptoms of Posttraumatic Stress Disorder. Each item of the PPTSD-R corresponds to one of the DSM-IV PTSD symptoms. Respondents rated the frequency with which each symptom occurred on a 1-5

scale anchored by "Not at all" and "often" with an intermediate rating labeled "sometimes." Lauterbach and Vrana report that the internal consistency of the PPTSD-R is good (Chronbach's alpha = .91) and its scores are stable over time (two week test-retest r=.91).

Reinforcement and Modeling Scales (Whitehead et al., 1992)

The Reinforcement and Modeling Scales developed by Whitehead and colleagues (1992) were used to retrospectively measure reinforcement of illness behavior in the individual when he or she was a child and parental modeling of illness behavior. The measure consists of six scales that assess modeling and reinforcement for bowel symptoms, cold symptoms, and menstrual symptoms. Internal consistency of the six subscales ranged from .77 to .93 and three-month test-retest reliability ranged from .48 to .82.

Illness Priming Measure

The Illness Priming Measure was designed for the current study and consists of seven items that assess the frequency of events and interactions that trigger people to think about their health status. Items such as "When I was a child I was asked how I was feeling physically" were rated on a 6-point frequency scale (1 = Never, 2 = Rarely (once or twice a year), 3 = Sometimes (once or twice each season), 4 = Often (once or twice a month), 5 = Frequently (once or twice a week), 6 = Always (every day). The internal consistency of the scale in the current sample was adequate (alpha=.73).

Behavioral Risk Factor Surveillance System Questionnaire (BRFSS; CDC, 1998)

The BRFSS is a comprehensive assessment tool used in many states to evaluate health behavior. The subscales used in the current study were exercise, smoking, alcohol, and obesity. In a study of reliability of the BRFSS based on a sample of Massachusetts residents, 3-6 week test-retest reliability ranged from .45-.90 (Stein, Lederman & Shea, 1993). Low reliabilities

were found for report of exercise behavior (alpha =0.45) and higher reliabilities were found for number of cigarettes smoked (alpha =0.73), number of alcoholic drinks consumed per month (alpha=0.72) and body mass index based on self-report of height and weight (alpha=0.90).

Outcome Measures

Wahler Physical Symptom Inventory (WPSI; Wahler, 1968)

The Wahler Physical Symptom Inventory was used to measure the intensity of physical health complaints (Wahler, 1968). The WPSI is a 42-item self report scale of physical complaints that asks participants to rate how much they are "bothered" by a particular symptom on a 6-point Likert type scale ranging from "almost never" to "nearly every day". Wahler reported good internal consistency of the scale (alpha = .91). Test-retest reliabilities over a period of one day to one week ranged from .69 to .94 (M=.81).

The Medical Outcomes Study Short Form Health Survey (MOS SF-36; Ware & Sherbourne, 1992)

The Medical Outcomes Study Short Form Health Survey (SF-36; Ware & Sherbourne, 1992) was used to assess functional health status. The SF-36 was designed for use in clinical research and assesses eight health concepts: 1) limitations in physical activities because of health problems, 2) limitations in physical activities because of physical or emotional problems, 3) limitations in usual role activities because of physical health problems, 4) limitations in usual role activities because of mental health problems, 5) general mental health, 6) bodily pain, 7) vitality, 8) general health perceptions. Brazier, Harper, Jones and colleagues (1992) report the overall reliability (Chronbach's alpha) was greater than 0.85 in a sample of 1980 patients. The reliability of individual scales ranged from 0.76 to 0.90.

Self-Report Healthcare Utilization Behavior Survey

This survey was designed by the researcher to gather self-reported healthcare utilization behavior. Participants were asked to report number of visits to doctors in the past year, number of current medications, number of emergency room visits in the past year, and number of specialist visits in the past year. These items were selected based on prior research evaluating the relationship between sexual trauma and healthcare utilization (Sansone, Wiederman, & Sansone, 1997). A composite score was computed by summing the standardized values of the four questions.

Procedure

Participants were drawn from the Introductory Psychology participant pool at Virginia Polytechnic Institute and State University and met in twenty groups of approximately fifteen students. In order to encourage participation, subjects were offered extra credit in psychology classes. They were provided a consent form to read and offered the opportunity to ask questions about the study prior to signing. Participants were then given a release of information form allowing the researcher to acquire the following information about utilization behavior from August, 2000 to March 2001 from the university-affiliated Schiffert Health Center: number of visits, number of phone contacts with a health care professional, number of current prescriptions, and number of specialist referrals. A packet of self-report questionnaires was then handed out.

Schiffert Health Center staff was provided with a table containing the names, student identification numbers, and code numbers for participants who released their medical information for the study. The table contained columns for each of the four variables requested the Schiffert Health Center staff reviewed the medical records and entered the utilization data

into the table. The staff then removed the identifying information (names and student identification numbers) and returned the data in electronic format. This data was merged with the larger datasheet using the assigned code numbers.

Data Analysis

Descriptive statistics were computed first in order to assess the composition of the sample. Simple correlations among the predictor and outcome measures were conducted to assess the hypothesized associations among trauma history, illness-related learning history, current health behaviors, and current illness behaviors. Partial correlations were used to evaluate the role of illness-related learning history on illness behaviors and PTSD symptoms, controlling for trauma severity. Hierarchical multiple regression analyses were then used to test the hypothesized models and to evaluate the contribution of each variable to the prediction of illness behaviors.

Results

Descriptive Statistics

Table 2 provides the means, standard deviations, and ranges for all variables included in the analyses. In the current sample, 86.8% of participants reported experiencing one of the traumatic events listed. The mean number of events experienced was 3.11 (sd = 2.44) and 47.9% of the sample had experienced three or more events. The most frequently endorsed events were receiving news of the violent death or injury of a loved one (30.6%), being in or witnessing a serious accident (9.5%), and being in danger of loss of life or serious injury (9.2%). An additional 14.9% of the sample reported having been a victim of some form of assault (childhood physical or sexual assault, adult physical or sexual assault, violent crime victim). The severity of the incidents was rated on a 7-point scale with higher numbers indicating the event was experienced as more traumatic at the time of the event. Using this scale, 79.3% of the events were rated at a 3 or higher level and 64.8% of the events were rated at a 5 or higher level. As shown in Table 2, the mean severity rating was 4.94 (sd = 1.67).

The ten most frequently reported physical health symptoms are reported in Table 3. For descriptive purposes, the frequency data was dichotomized so that a rating of being bothered by a symptom at least once a week was considered a positive endorsement, and being bothered by a symptom once a month or less was considered a negative endorsement. The ten most frequently endorsed symptoms were feeling tired, headaches, difficulty sleeping, neck aches or pains, backaches, feeling hot or cold regardless of the weather, intestinal or stomach trouble, arm or leg aches or pains, muscular tensions, and muscular weakness.

The number of self-reported doctor's visits, phone calls, specialist referrals and emergency room visits were summed to create the total self-reported healthcare utilization

variable. The data are shown in their raw form in Table 2 for easier interpretation, but each variable was standardized prior to summing in order to create a total utilization variable for the analyses. Participants reported an average of 5.84 (sd = 5.55) contacts or referrals in the prior year. Similarly, summing the standardized values of data acquired from the Schiffert Health Center created a total health center utilization variable by summing visits, phone calls and referrals, but the raw data values are shown in Table 2. The health center reported an average of 5.09 (sd=4.06) contacts by participants. Functional health status was computed by summing the standardized values for each item. Higher values reflect worse functional health status.

Correlations were computed among all of the predictor and criteria variables and are presented in Table 4. As predicted, trauma severity is associated with increased health complaints, worse functional health status, and more self-reported healthcare utilization. The association between trauma and health center-reported utilization, however, was non-significant. For this reason, self-reported utilization was used in the regression analyses presented below.

Alcohol consumption was also associated with trauma severity, but not in the expected direction. In this sample, increased trauma severity was significantly correlated with less alcohol use per month. Other health behavior measures (exercise, smoking, obesity) were not associated with trauma severity.

Three of the four health behaviors (exercise, smoking, obesity) were associated with functional health status in the predicted directions. Associations with physical health complaints and utilization behavior, however, were not found.

The illness learning history variables were associated with illness behavior outcomes. Health complaints were positively correlated with parental modeling of illness, reinforcement as a child for illness behavior and priming of illness concerns. Functional health status was

associated with reinforcement history. Self-reported healthcare utilization and health center-reported utilization were associated with priming. None of the three illness learning history variables were associated with PTSD symptoms.

Mediational role of PTSD symptoms in the relationship between traumatic experiences and illness behaviors

Health Complaints. The mediational role of PTSD symptoms in the relationship between traumatic events and health was evaluated with each of the three illness behavior outcome variables. Three steps were used to assess mediation for this analysis and analogous procedures were used for subsequent evaluations of mediational variables. First, a positive correlation between trauma severity and PTSD symptoms was found. Then, a positive association between trauma and health complaints was determined. Finally, PTSD symptoms predicted health complaints controlling for trauma severity and trauma severity no longer significantly contributed to the prediction of health complaints. Consistent with prior literature, PTSD symptoms wholly mediated the relationship between traumatic experiences and health complaints in the current sample (see Table 5).

Functional Health Status. As shown in Table 6, the relationship between traumatic experiences and functional health status was also mediated by PTSD symptoms. Notably, over 21.6% of the variance in functional health status was explained by severity of the traumatic experience and current PTSD symptoms. A closer examination of the factors comprising overall functional health status (physical functioning, role limitations due to physical problems, social functioning, bodily pain, general mental health, role limitations due to emotional problems,

vitality, general health perceptions) indicated that only two factors were directly related to severity of the traumatic event (bodily pain and social functioning) whereas all eight factors were significantly correlated with PTSD symptoms (see Table 7 for more information).

Health Care Utilization. As Table 8 indicates, PTSD symptoms did not mediate the relationship between traumatic experiences and health care utilization. A closer examination of these results indicated that the correlation between PTSD symptoms and total health care utilization did not reach significance, indicating that PTSD symptomatology was not closely associated with use of health care facilities. Restricting the utilization variable to those indices over which the person has most control (i.e., number of visits, number of phone calls, number of ER visits) and excluding indices more distal from the person's control (i.e., number of prescriptions, number of specialist referrals) resulted in a significant correlation between PTSD symptoms and health care use. Using this index of health care use as an outcome measure in the mediational model, however, also failed to support the hypothesis that PTSD symptoms mediated the trauma-utilization relationship.

Illness-Related Learning History

The next set of analyses evaluated illness-related learning history as a predictor of current illness behavior and current PTSD symptoms. Further, hierarchical regression models were used to evaluate whether PTSD symptoms significantly predict illness behavior above and beyond illness-related learning history and trauma severity.

Illness-related learning history as a predictor of illness behaviors and PTSD symptoms controlling for trauma severity

Table 9 presents the partial correlations between illness-related learning history, current illness behaviors, and PTSD symptoms controlling for trauma severity. Similar to the first-order correlations presented in Table 4, all three illness-related learning history variables were associated with complaints after controlling for trauma severity. Reinforcement history was additionally correlated with functional health status, and priming history was associated with healthcare utilization, controlling for trauma severity. PTSD symptoms, however, were not significantly correlated with illness-related learning history after controlling for the effects of trauma severity.

PTSD symptoms as a predictor of illness behaviors above and beyond illness-related learning history

Health Complaints. As indicated previously, physical health complaints are significantly predicted by illness-related learning history. Table 4 demonstrated that all three illness-related learning history variables are significantly correlated with health complaints. However, as Step 2 in Table 10 illustrates, only priming emerges as a significant predictor in the model that controls for trauma history and includes all three illness-related learning history variables as predictors. Thus, when the variance accounted for by trauma severity is accounted for, being directed to think about their health status as a child (i.e. priming) is associated with number of health complaints as an adult. In this model, both priming and PTSD symptoms are significantly associated with health complaints, indicating that each has a unique influence on physical health complaints. Further, the final step in the current analysis indicates that PTSD symptomatology

accounts for an additional 4.9% of the variance in number of health complaints above and beyond illness-related learning history.

Functional Health Status. Table 11 displays the hierarchical regression analyses predicting functional health status with illness-related learning history and PTSD symptoms. In step 2, both trauma severity and reinforcement for illness as a child significantly predict functional health status. Modeling and priming, however, do not significantly contribute to the model. The combination of trauma severity and all illness-related learning history variables accounts for 5% of the variance in current functional health status. When PTSD symptoms are added to the model an *additional* 19% of the variance is explained, and the predictive power of trauma severity becomes non-significant.

Health Care Utilization. The same hierarchical regression procedure was used to predict health care utilization. As Table 12 illustrates, priming emerges consistently as a predictor of utilization, controlling for trauma severity. PTSD, however, does not significantly contribute to the prediction of self-reported healthcare utilization, even after controlling for trauma severity and the three illness learning history variables.

Current Health Behaviors

As described previously, negative health behaviors have previously been associated with a history of traumatic events. The planned analyses evaluated whether that correlation accounts for the mediational role of PTSD symptoms between trauma and illness behavior. However, in this dataset, trauma severity was associated only with alcohol use (see table 4). Therefore, the planned analysis that would evaluate a mediational role of current health behaviors in the relationship between traumatic experiences and illness behaviors is not appropriate. Instead,

regression analyses are used to assess whether PTSD symptoms predict illness behaviors above and beyond health behaviors.

PTSD symptoms as a predictor of illness behaviors above and beyond current health behaviors

Health Complaints. The simple correlations presented in Table 4 indicated that health behaviors were not associated with health complaints. Health behaviors are, therefore, unlikely to affect the mediational role of PTSD in explaining the relationship between trauma history and physical health complaints, and the planned regression analyses were not appropriate in this sample.

Functional Health Status. Exercise, smoking, and obesity were found to be significantly correlated with functional health status (see Table 4). Table 13 presents the hierarchical regression model assessing the role of PTSD in predicting functional health status above and beyond trauma severity and health behaviors. Controlling for trauma severity, smoking and exercise predict functional health status and all health behaviors measured account for 8% of the variance in functional health status beyond trauma severity. When PTSD is added to the model, smoking and exercise continue to significantly add to the model and PTSD contributes an additional 19.1% of the variance. Thus all three of these variables uniquely predict, functional health status.

Health Care Utilization. As presented in Table 4, neither health behaviors nor PTSD significantly predict healthcare utilization behavior. Only trauma severity contributes to the model and helps explain utilization behavior. The planned regression analyses, therefore, were not appropriate.

PTSD symptoms as a predictor of illness behavior above and beyond both illness-related learning history and current health behaviors

To test for the presence of an independent effect of PTSD symptoms after controlling for health behaviors and learning history, regression analyses in which trauma severity, health behaviors, and illness learning history were entered first and PTSD symptoms were entered last were conducted. Initially, all predictor variables are included in the model in order to provide the greatest challenge to PTSD symptoms. The most parsimonious models predicting illness behaviors, which include only those variables that are significant, are then presented.

Health Complaints. Table 14 presents the full model for the prediction of health complaints with illness-related learning history, current health behaviors, and PTSD symptomatology. PTSD symptomatology accounts for an additional unique 4.3% of the variance in health complaints beyond both learning history and health behaviors for a total of 13.7%. The more parsimonious model is presented in Table 12 and accounts for13.6% of the variance in health complaints with priming, smoking and PTSD symptoms as predictor variables.

Functional Health Status. The previous analyses demonstrated that functional health status is predicted both by reinforcement for health problems as a child and certain current health behaviors, and that PTSD symptoms additionally predict functional health status. Table 15 shows that PTSD symptoms continue to be a significant predictor above and be yond *both* illness-related learning history and current health behaviors. The significant variables are reinforcement, smoking, exercise, and PTSD symptoms, with the variance accounted for by the severity of the traumatic event being accounted for in step 4 by PTSD symptomatology. Table 14 presents the reduced model that includes only those variables that are significant predictors, and accounts for 31.3% of the variance in functional health status.

Health Care Utilization. Consistent with previous analyses using health care utilization as the outcome variable, priming and trauma severity are the only variables that significantly predict current utilization behavior (see Table 16). Thus, the most parsimonious model for the prediction of utilization excludes all other illness-related learning history and all current health behavior variables (see Table 16). The model including only trauma severity and childhood priming predicts 5.7% of the variance in health care utilization. Unlike health complaints and functional health status, utilization behavior does not appear to be affected by PTSD symptomatology.

Discussion

The goal of the current research was to expand our understanding of how the experience of traumatic events affects illness behaviors. Symptoms of PTSD have been reliably found to mediate the trauma-illness relationship and, as indicated previously, the primary hypothesis about the mediational role of PTSD symptoms is that biological mechanisms associated with a chronic state of hyperarousal explain the impact of PTSD on health (Friedman & Schnurr, 1995). Two alternate explanations of the trauma-illness relationship were evaluated in the current study. The first competing hypothesis was that there is no objectively measurable change in health, b ut rather a change in the person's perception and reporting of his or her health status and that these changes in illness reporting were learned. Three dimensions of learning (modeling, reinforcement and priming) were studied to test this hypothesis. Sec ond, experiencing traumatic events has been associated with more negative health behaviors that may then produce increased health problems and explain the trauma-illness relationship. This proposition was tested by assessing alcohol use, smoking, exercise behavior, and obesity.

The study replicated and extended prior research in the area of trauma and health outcomes. As previously reported, increased trauma severity was found to be positively associated with health complaints, functional health status, and utilization of health care services. PTSD symptoms were additionally found to mediate the relationship between trauma history and health complaints, replicating prior research. Further, PTSD symptoms were found to mediate the relationship between trauma history and functional health status.

PTSD symptoms, however, were not a significant mediator in the relationship between trauma severity and healthcare utilization, even when utilization was restricted to help-seeking behaviors (number of clinic visits, number of phone calls, number of emergency room visits).

This null finding may reflect greater complexity in the factors affecting the behavior of using health services compared to the more direct reporting of somatic experiences and daily health functioning. These results diverged from prior research in that the correlation between PTSD symptoms and healthcare utilization was non-significant. This may be due to prior research using PTSD diagnosis rather than symptoms in their analyses. In order to meet diagnostic criteria for PTSD, the symptoms must be severe enough to be causing impairment in functioning (APA, 1994) and this impairment may result in the individual seeking help at a healthcare facility. While the questions on the PTSD symptom measure used in the current study are worded so as to imply that they cause meaningful distress ("were you bothered by memories…", "have you had upsetting dreams…", etc., emphasis added) , the questionnaire does not directly evaluate either the intensity or the level of interference of the symptoms in the person's life. Instead, participants indicate the frequency with which they experience the symptoms. It may be important, therefore, to measure both the frequency of the symptoms and the level of distress experienced when the symptoms occur.

The restricted age of the population may also have affected prediction of healthcare utilization in this study. Since the trauma-illness behavior relationship is predominantly explained by the person's response to the traumatic event (as reflected by PTSD symptomatology), it is possible that the illness consequences develop over time. The young age of the college population may not have allowed sufficient time for health problems to develop. This may particularly affect the utilization outcome variable, as illness must develop to a threshold sufficient to warrant the extra effort associated with visiting a doctor.

An attempt was made in this study to expand the measures of illness behaviors from self-report to more objective data by gathering health center utilization data. However, due to the lack of association between trauma severity and health center utilization, the mediating effects were unable to be tested. In order to control for elevated symptom reporting in general, research should continue to assess illness both through self-report and objective indices.

The effects of illness learning history on current illness behavior suggested that an environment where illness reinforcement was modeled was sufficient to make people notice and report physical ailments but did not affect the more active behaviors included in a measure of functional health status or required for health care utilization. Direct reinforcement for health problems had a more pervasive effect in that it related to both increased complaints and decreased health functioning. This measure evaluated both positive and negative reinforcement for cold, menstrual, and bowel symptoms. Items assessed reinforcement such as receiving special treats and attention, missing school, and being excused from homework when ill. This latter effect may be due to the avoidance of functional behaviors during illness as a child (e.g., being excused from homework and chores) that developed into a pattern of reduced capacity to fulfill functional roles as an adult. Health care utilization behavior was associated only with a childhood history of being primed to think about illness (e.g., being asked if you are ill, being reminded to wash your hands to avoid germs). The items in this measure may also be considered an assessment of parental concern about illness. Thus, the individual who is high on this scale may have grown up in an environment where other people generally attend to illness. The interpersonal dimension of parental attention may explain the association of priming with health care utilization, as accessing the patient-doctor relationship may have become a way of continuing to involve others in one's illness.

The first challenge to the hypothesis that PTSD symptoms accounted for the trauma-health relationship was tested in regression analyses in which each of the measures of illness behavior were regressed on each of the three measures of social learning history. The hypothesis that learning history would alone account for the trauma/illness relationship was not supported. Rather, PTSD symptomatology remained a predictor of health complaints and functional health status even after the influences of illness-related childhood learning environments. These results suggested that increased illness behaviors in people with trauma histories are, in part explained by true changes in health status as opposed to learned illness-reporting behaviors.

Trauma history and PTSD symptoms have been associated with increased negative health behaviors (for example, Acierno et al., 1996; Dansky et al., 1997). The Centers for Disease Control (2002) review evidence that health behavior significantly affects illness and healthcare utilization. It was hypothesized, therefore, that the negative health effects of changes in health behavior might explain changes in illness behavior (health complaints, functional health status and utilization behavior) associated with traumatic events and PTSD. In the present study, however, health behaviors were not powerful predictors of either health complaints or health care utilization but did explain a significant amount of the variance in functional health status. The lack of association between health behaviors and physical health complaints or utilization is not consistent with prior studies, but may reflect the younger age of the present sample. Being relatively young, participants had less time for unhealthy behaviors to have created sufficiently severe health problems to be noticed by the person as important. These individuals, therefore, did not report health problems and are not seeking help at this time. It is notable, however, that daily functional health status was negatively affected by health behavior, suggesting that

unhealthy behavior (smoking, decreased exercise, obesity) had an impact on health and a follow-up study of these individuals may demonstrate increased utilization later in life.

PTSD symptoms were significantly predictive of both health complaints and functional health status above and beyond health behaviors. This was particularly meaningful with regard to functional health status where part of the variance was explained by both PTSD symptoms and health behaviors. The negative impact of smoking, being obese, and exercising less did not explain the pathway by which PTSD symptomatology exerts its influence over health.

Finally, an independent effect of PTSD symptoms on health complaints and functional health status persisted even after controlling for trauma severity and *both* health behaviors and illness learning history. PTSD symptoms were, therefore, a robust predictor of illness complaints and functional status and their influence was not explained by either the higher levels of unhealthy behavior that are associated with traumatized individuals or by social learning constructs. In the more parsimonious prediction model, priming emerged as a significant predictor of health complaints and healthcare utilization, whereas modeling and reinforcement were not significant. This is consistent with Bargh's (1994) conceptualization of priming functioning to establish patterns of thought and/or behavior that are ready to be activated when the appropriate trigger is present. In this case, the trigger may be the physiological distress associated with the severity of the trauma at the time of the event and the behavior that is activated is reporting health problems and seeking help for those problems. The items on the current priming measure assessed parental expression of concern about the person's health status including asking him or her to report on their health status. In addition, the presence of illness-related cues in the child's environment were assessed in items that evaluated such contextual factors as the frequency with which someone in the family went to the doctor or took medication.

None of the items on the priming measure, however, assessed the functional status of other family members or statements that may have been made in the household about what to do when one is ill (for example, "My parents said 'Sick people should stay at home so they don't get anyone else ill'"). The loading of the measure on priming for illness reporting and service use, therefore, may explain the differences in the measure's prediction of health complaints and utilization but not functional health status.

The more parsimonious models of the three illness behavior outcomes indicate that there are different pathways for the three variables. Specifically, learning history, health behavior, and PTSD symptoms all contribute to the predictions of health complaints and functional health status. In contrast, PTSD symptoms do not contribute to the prediction of healthcare utilization. This suggests the possibility that the decision to seek help is more influenced by a learned automatic behavior in response to a cue and less affected by symptoms. Since trauma severity and priming predicted utilization, it is possible that the peritraumatic reactions at the time of the event cue the learned help-seeking behavior irrespective of the presence or absence of subsequent symptoms. Further, the findings that different types of learning history predicted different illness behaviors and that illness-related learning history does affects physical health complaints but not psychiatric complaints suggests a specificity of the learning. As hypothesized previously, the reinforcement measure assessed in part how much the person was excused from usual functions (school, chores, other activities) as a result of illness. This correlated with a decrement in current functioning. The priming measure evaluated symptom reporting and healthcare use, and correlated with health complaints and utilization.

Limitations

It is important to note the limitations of the current study. The design of the study used retrospective evaluations of traumatic experiences and illness-related learning history. Emotional disorders can affect the quality of material that people remember (Christianson & Safer, 1996). Clinical anxiety can lead to selective attention to threat, and people with depression and with post-traumatic stress disorder can have difficulties in retrieving specific autobiographical memories (Williams & Dritschel, 1988; McNally, Litz, Prassas, Shin, & Weathers, 1994). Recall is also affected by current mood (Eich, Macaulay, & Ryan, 1994) and therefore if an individual's mood is mildly depressed secondary to illness at the time of the assessment, that person may be more likely to retrieve more negative events and judge them to be more extremely distressing. This type of competing hypothesis cannot be excluded with a retrospective study.

In addition, the conclusions drawn from the current study should be tentative due to the low correlation coefficient values and the number of analyses run without statistically correcting for chance findings. The interpretation of these data, therefore, should be cautious and future work should attempt to replicate the findings in a population selected specifically for trauma history.

Future Directions

Based on the current investigation future research should continue to include PTSD symptomatology in models explaining physical health complaints and health status after traumatic experiences. Attempts to further explain this relationship should additionally consider the influences of illness-related learning history as this was shown to exert significant influence

over illness behaviors. The three types of learning history (modeling, reinforcement, priming) should each be looked at more closely with the goal of understanding why they predict different illness behaviors. Additionally, a prospective, longitudinal design would be a better methodological approach as it would eliminate the potential confounds introduced by relying on memory.

In the present study, learning history, health behaviors, and PTSD symptoms were all found to influence illness behaviors. The hypothesis that associations among trauma, PTSD symptoms and health complaints could be explained by a learning history that encouraged symptom reporting was not supported. Rather, learning history and PTSD symptoms uniquely contributed to health complaints. The distress associated with experiencing trauma plays a significant role in self-reported health complaints and functional health status and the mechanism of that effect is yet to be determined. The implications of this support a biopsychosocial approach to the understanding and treatment of illness phenomena. When assessing patients, medical professionals should consider inquiring for lifetime traumatic experiences and the individual's current trauma-related symptomatology. For a subset of patients, focused mental health treatment may present a useful adjunct to medical treatment of the illness. While future studies need to assess the effectiveness of such approaches, the present study indicates that PTSD remains an important pathway to illness behavior in trauma populations.

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Table 1
Demographic characteristics of the study sample

Variable	Category	N	% sample
Sex:	Male	121	40.6
	Female	177	59.4
Age	18 years	79	26.6
	19 years	120	40.4
	20 years	65	21.9
	21 years	17	5.7
	22 years	10	3.4
	23-27 years	6	1.9
Race	Amer. Indian or Alaskan Native	0	0
	Asian or Pacific Islander	31	10.4
	African-American	16	5.4
	Hispanic (non-white)	5	1.7
	Caucasian	238	79.9
	Bi/Multicultural or other	8	2.7
Marital Status	Single	288	97
	Married	1	.3
	Cohabiting	0	0
	Separated	0	0
	Divorced	1	.3
	Widowed	0	0
	Other (ex., engaged)	7	2.4
Education Level	1st year	155	52.0
	2nd year	93	31.2
	3rd year	36	12.1
	4th year	9	3.0
	5th (or greater) year	5	1.7
	Graduate	0	0

Table 2

Means and Standard Deviations and Internal Consistency Reliabilities

Variable	Mean	Standard Deviation	Range	□
1.Trauma Variables				
Trauma severity (at time of event)	4.94	1.67	1-7	N/A
PTSD symptoms	30.09	12.38	17-80	.9223
2. Health Behaviors				
Amt. Exercise (hrs/wk)	4.10	3.96	0-18	N/A
Amt. tobacco used/day	1.45	4.26	0-40	N/A
# alcoholic drinks/month	22.94	28.77	0-150	N/A
Body Mass Index (BMI)	23.06	3.91	15.47-49.38	N/A
3. Learning History				
Parental modeling	10.88	6.72	0-29	.8482
Childhood reinforcement	19.82	10.18	0-53	.8877
Priming	16.21	5.19	0-33	.7285
4. Illness Behavior Outcomes				
Physical health conditions	34.45	22.68	0-141	.9187
Functional Health Status (stdized)	0	17.51	-28.35-80.57	.8828
Total self-reported utilization	5.84	5.55	0-39	.5284
Total health center-reported utilization	5.09	4.60	0-26	.5275

Table 3

Most Frequently Endorsed Physical Health Symptoms

Symptom	% endorsed
Feeling tired	70.8%
Headaches	43.9%
Difficulty Sleeping	32.2%
Neck aches or pains	28.5%
Backaches	27.9%
Feeling hot or cold regardless of the weather	22.8%
Intestinal or stomach trouble	18.1%
Arm or leg aches or pains	17.8%
Muscular tensions	16.1%
Muscular weakness	15.4%

Table 4

Univariate correlations among predictor and outcome variables

	1	2	3	4	5	6	7	8	9	10	11	12
Trauma Variables												
1 Trauma severity	-											
2 PTSD	.431**	-										
Health Behaviors												
3 Exercise	-.045	-.032	-									
4 Smoking	-.027	.019	-.125*	-								
5 Alcohol	-.131*	-.108	.059	.115*	-							
6 BMI	-.035	.094	.078	-.022	.068	-						
Learning History												
7 Modeling	.005	.060	.013	.049	-.011	.038	-					
8 Reinforcement	-.044	.024	-.120*	.085	.006	.101	.618**	-				
9 Priming	.135*	.089	.012	-.095	-.035	.074	.218**	.208**	-			
Illness Behavior Outcomes												
10 Health Complaints	.126*	.271**	-.008	.103	-.049	.056	.190*	.150*	.265**	-		
11 Functional Health Status	.122*	.453**	-.164*	.210**	-.014	.119*	.102	.162*	.069	.436**	-	
12 Self-report utilization	.141*	.104	.080	-.061	.019	.040	.027	-.014	.205*	.247**	.273**	-
13 Health Center utilization	.097	.146	-.013	-.059	-.012	.042	-.001	.024	.263*	.266*	.217*	.608**

**p<.005; *p<.05

Table 5

Mediational role of PTSD symptoms between traumatic experiences and number of health complaints

Predictors	Beta	t	Total R^2	F(df)
Regression 1: Prediction of PTSD symptoms: Traumatic event as predictor variable				
Traumatic Event	.431	8.00*	.186	64.01 (1, 281)
Regression 2: Prediction of physical health complaints: Traumatic event as predictor variable				
Traumatic Event	.123	2.08*	.015	4.34 (1, 281)
Regression 3: Prediction of physical health complaints: Traumatic events and PTSD symptoms as predictors				
Traumatic Event	.011	.177		
PTSD Symptoms	.267	4.076*	.070	10.60* (2, 280)

*p<.05

Table 6

Mediational role of PTSD symptoms between traumatic experiences and functional health status

Predictors	Beta	t	Total R^2	F(df)
Regression 1: Prediction of PTSD symptoms: Traumatic event as predictor variable				
Traumatic Event	.431	8.00*	.186	64.01 (1, 281)
Regression 2: Prediction of functional health status: Traumatic event as predictor variable				
Traumatic Event	.147	2.483*	.022	6.164 (1, 280)
Regression 3: Prediction of functional health status: Traumatic events and PTSD symptoms as predictors				
Traumatic Event	-.068	-1.144		
PTSD Symptoms	.489	8.274*	.214	38.057* (2, 279)

*p<.05

Table 7

Simple correlations between trauma severity, PTSD symptoms, and functional health status factors

Factor	Trauma Severity	PTSD Symptoms
Role limitations due to physical problems	.005	.134*
Role limitations due to emotional problems	.095	.292**
Bodily pain	.159*	.399**
Vitality	.090	.426**
General mental health	.096	.229**
Social Functioning	.118*	.430*
Physical Functioning	.098	.381**
General health perceptions	.046	.221**

*****($p<.05$)

Table 8

Mediational role of PTSD symptoms between traumatic experiences and health care utilization

Predictors	Beta	t	Total R^2	F(df)
Regression 1: Prediction of PTSD symptoms: Traumatic event as predictor variable				
Traumatic Event	.431	8.00*	.186	64.01 (1, 281)
Regression 2: Prediction of utilization: Traumatic event as predictor variable				
Traumatic Event	.143	2.378*	.020	5.653 (1, 271)
Regression 3: Prediction of utilization: Traumatic events and PTSD symptoms as predictors				
Traumatic Event	-.114	1.712		
PTSD Symptoms	.066	.983		
			.024	3.309* (2, 270)

*p<.05

Table 9

Partial correlations among illness learning history, illness outcomes, and PTSD symptoms, controlling for trauma severity

	1	2	3	4	5	6	7
1 Modeling	-						
2 Reinforcement	.6158**	-					
3 Priming	.2489**	.2359**	-				
4 Health Complaints	.2031**	.1730**	.2689**	-			
5 Functional Health Status	.0528	.1521*	.0932	.4342**	-		
6 Self-report utilization	.0301	-.0061	.1904**	.2450**	.2635**	-	
7 PTSD	.0433	.0188	.0243	.2287**	.4315**	.0560	-

*p<.05; **p<.005; n=268

Table 10

PTSD symptoms as a predictor of health complaints above and beyond illness -related learning history

Model	Chg R^2	Predictor Variables	b	Std Error	Beta	Significance
1	.015	Trauma Severity	1.665	.800	.124	.038
2	.081	Trauma Severity	1.343	.775	.099	.084
		Modeling	.395	.245	.119	.108
		Reinforcement	.078	.164	.035	.640
		Priming	.942	.263	.214	.000
3	.049	Trauma Severity	-.120	.840	-.009	.886
		Modeling	.340	.239	.102	.157
		Reinforcement	.086	.160	.039	.590
		Priming	.946	.256	.215	.000
		PTSD symptoms	.452	.114	.245	.000

Table 11

PTSD symptoms as a predictor of functional health status above and beyond illness-related learning history

Model	Chg R^2	Predictor Variables	b	Std Error	Beta	Significance
1	.022	Trauma Severity	1.430	.575	.148	.013
2	.028	Trauma Severity	1.469	.576	.152	.011
		Modeling	-.101	.181	-.042	.579
		Reinforcement	1.469	.576	.152	.017
		Priming	-.101	.181	-.042	.689
3	.190	Trauma Severity	.078	.193	.025	.300
		Modeling	-.165	.163	-.069	.311
		Reinforcement	.300	.108	.188	.006
		Priming	.080	.173	.025	.646
		PTSD symptoms	.641	.077	.486	.000

Table 12

PTSD symptoms as a predictor of health care utilization above and beyond illness -related learning history

Model	Chg R^2	Predictor Variables	b	Std Error	Beta	Significance
1	.020	Trauma Severity	.239	.101	.143	.018
2	.038	Trauma Severity	.196	.100	.118	.051
		Modeling	.009	.031	.021	.786
		Reinforcement	-.018	.021	-.066	.388
		Priming	.111	.034	.200	.001
3	.003	Trauma Severity	.155	.111	.093	.163
		Modeling	.008	.031	.018	.811
		Reinforcement	-.018	.021	-.065	.394
		Priming	.110	.034	.199	.002
		PTSD symptoms	.013	.015	.057	.392

Table 13

PTSD symptoms as a predictor of functional health status above and beyond current health behaviors

Model	Chg R^2	Predictor Variables	b	Std Error	Beta	Significance
1	.023	Trauma Severity	1.506	.618	.153	.016
2	.080	Trauma Severity	1.193	.630	.120	.060
		Alcohol	.009	.037	.016	.806
		Smoking	.805	.248	.207	.001
		Exercise	-.594	.270	-.140	.029
		Obesity	.566	.298	.121	.059
3	.191	Trauma Severity	-.476	.587	-.048	.418
		Alcohol	.003	.033	.004	.941
		Smoking	.710	.221	.182	.002
		Exercise	-.560	.240	-.132	.021
		Obesity	.430	.240	.092	.107
		PTSD symptoms	.636	.079	.480	.000

Table 14

PTSD symptoms as a predictor of physical health complaints above and beyond current i lless-related learning history and health behaviors

Model	Chg R^2	Predictor Variables	b	Std Error	Beta	Significance
1	.015	Trauma Severity	1.605	.850	.124	.060
2	.063	Trauma Severity	1.145	.844	.088	.176
		Modeling	.333	.252	.107	.188
		Reinforcement	-.015	.172	-.007	.932
		Priming	.912	.287	.211	.002
3	.016	Trauma Severity	1.086	.852	.084	.204
		Modeling	.321	.253	.103	.207
		Reinforcement	-.026	.174	-.012	.880
		Priming	.961	.289	.223	.001
		BMI	-.145	.407	-.023	.722
		Alcohol	-.042	.049	-.056	.386
		Smoking	.575	.322	.116	.076
		Exercise	-.014	.380	-.002	.970
4	.043	Trauma Severity	-.246	.924	-.019	.790
		Modeling	.287	.248	.092	.248
		Reinforcement	-.012	.171	-.005	.946
		Priming	.943	.282	.218	.001
		BMI	-.196	.399	-.031	.623
		Alcohol	-.034	.048	-.045	.483
		Smoking	.519	.316	.105	.102
		Exercise	.055	.372	.009	.882
		PTSD symptoms	.406	.122	.234	.001

Table 15

Parsimonious model predicting physical health complaints

Predictor Variables	b	Std Error	Beta	Significance
Priming	1.149	.239	.265	.000
Smoking	.621	.288	.119	.032
PTSD symptoms	.446	.100	.244	.000

Table 16

PTSD symptoms as a predictor of functional health status above and beyond illness -related learning history and current health behaviors

Model	Chg R^2	Predictor Variables	b	Std Error	Beta	Significance
1	.024	Trauma Severity	1.505	.637	.154	.019
2	.029	Trauma Severity	1.613	.644	.165	.013
		Modeling	-.179	.192	-.077	.352
		Reinforcement	.329	.131	.207	.013
		Priming	-.018	.219	-.006	.934
3	.092	Trauma Severity	1.643	.623	.168	.009
		Modeling	-.154	.185	-.066	.407
		Reinforcement	.244	.127	.154	.057
		Priming	.070	.211	.021	.741
		BMI	.272	.298	.057	.362
		Alcohol	-.025	.036	-.044	.489
		Smoking	.773	.236	.207	.001
		Exercise	-.864	.278	-.197	.002
4	.175	Trauma Severity	-.376	.617	-.038	.543
		Modeling	-.204	.165	-.087	.218
		Reinforcement	.266	.114	.168	.020
		Priming	.042	.189	.013	.823
		BMI	.195	.266	.041	.464
		Alcohol	-.011	.032	-.020	.720
		Smoking	.688	.211	.184	.001
		Exercise	-.759	.249	-.173	.003
		PTSD symptoms	.615	.081	.471	.000

Table 17

Parsimonious model predicting functional health status

Predictor Variables	b	Std Error	Beta	Significance
Reinforcement	.163	.084	.104	.053
Smoking	.628	.200	.167	.002
Exercise	.818	.237	-.184	.001
PTSD symptoms	.602	.069	.457	.000

Table 18

PTSD symptoms as a predictor of health care utilization above and beyond illness-related learning history and current health behaviors

Model	Chg R^2	Predictor Variables	b	Std Error	Beta	Significance
1	.021	Trauma Severity	.254	.115	.146	.029
2	.042	Trauma Severity	.193	.115	.111	.095
		Modeling	.025	.034	.059	.469
		Reinforcement	-.024	.023	-.084	.310
		Priming	.120	.040	.203	.003
3	.007	Trauma Severity	.195	.117	.112	.097
		Modeling	.026	.034	.055	.509
		Reinforcement	-.020	.024	-.070	.407
		Priming	.119	.040	.202	.004
		BMI	.091	.055	.011	.870
		Alcohol	.003	.007	.030	.655
		Smoking	-.021	.053	-.027	.693
		Exercise	.057	.052	.073	.277
4	.004	Trauma Severity	.139	.129	.080	.283
		Modeling	.021	.034	.051	.534
		Reinforcement	-.019	.024	-.067	.425
		Priming	.118	.040	.200	.004
		BMI	.007	.055	.008	.899
		Alcohol	.003	.007	.034	.618
		Smoking	-.023	.053	-.029	.669
		Exercise	.060	.052	.077	.254
		PTSD symptoms	.017	.017	.074	.317

Table 19

Parsimionious model predicting health care utilization

Predictor Variables	b	Std Error	Beta	Significance
Trauma Severity	.199	.099	.119	.045
Priming	.105	.032	.193	.001

Figure 1

PTSD symptoms and health behaviors mediates the relationship between traumatic events and illness behaviors

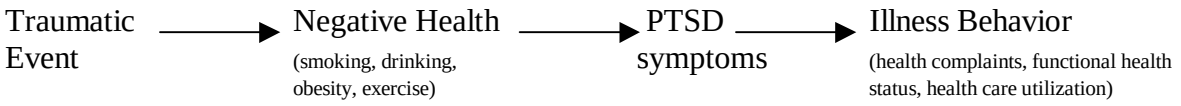


Figure 2

Illness-related learning history mediates between traumatic events and physical ad psychological symptoms

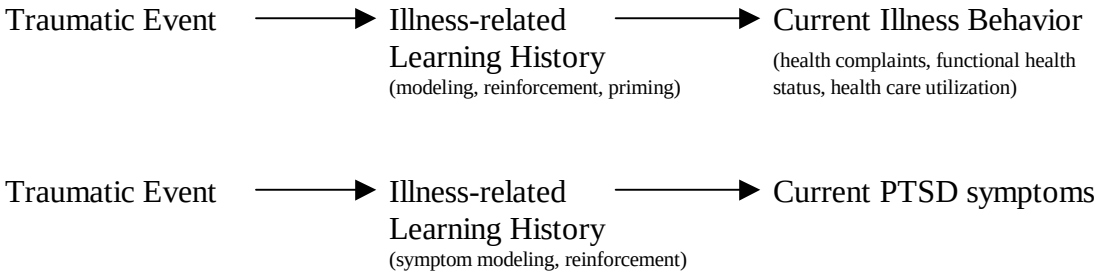
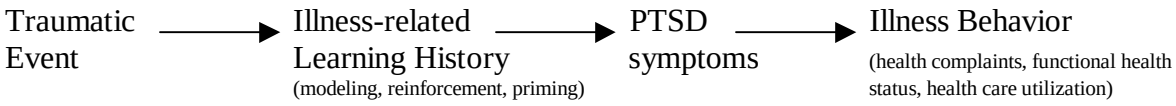


Figure 3

PTSD symptoms and Illness-related learning history mediate the relationship between traumatic events and illness behaviors



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Chandler, H.K. & Finney, J.W. (1999). *Exploring psychology: A reader and workbook*. New York: McGraw-Hill.

Shaffer, M.T. & Chandler, H.K. (1997). Identifying areas for workload reduction through system changes: Why bother?
Proceedings of the Seventh International Conference on Human-Computer Interaction, August 24-29, 1997, Vol. 1, 497-500

Ratey, J.J. & Chandler, H.K. (1995). Serenics: Therapeutic Potential in Psychiatric Disorders, *CNS Drugs, 4*, 256-262.

SYMPOSIA:

Clum, G.A., Chandler, H.K, Hirai, M., & Nelson, W. (2000). New Directions in Trauma Research: Assessment, Process, Adjustment, and Self-Treatment. 46th Annual Meeting of the Southeastern Psychological Association, New Orleans, LA.

PAPER PRESENTATIONS:

Kephart, C.M., & Chandler, H.K. (2000). Risk of Suicidal Behavior in Gay and Lesbian Adolescents. Annual Meeting of the American Association of Suicidology, Los Angeles, CA.

Chandler, H.K., & Clum, G.A. (2000). Trauma, Coping, and Support Predict Suicide. Annual Meeting of the American Association of Suicidology, Los Angeles, CA.

POSTER PRESENTATIONS:

Chandler, H.K., & Clum, G.A. (2001). Factors affecting the relationship between trauma and illness behavior. International Society for Traumatic Stress Studies 17th Annual Meeting, New Orleans, LA

Fox, L.D., Chandler, H.K., Whiteley, J.A., Williams, C.D., England, K., Dula, C., & Eisler, R.M. (2001). Effects of a manualized cognitive-behavioral anger management program on pre-post changes in self-reported cognitions and behaviors. World Congress of Behavior and Cognitive Therapies, Vancouver, Canada, 2001.

Chandler, H.K., & Clum, G.A. (2000). Coping strategies used by trauma victims influence health outcome. International Society for Traumatic Stress Studies 16th Annual Meeting, Austin, TX.

Chandler, H.K., & Clum, G.A. (2000). Negative coping strategies moderate the effect of peritraumatic responses on health complaints. 16th Annual Research Symposium of Virginia Tech, Blacksburg, VA.

Kephart, C., Chandler, H.K., Jones, R.T., & Ollendick, T.H. (2000). Children's coping strategies predict PTSD following residential fire. 108th Convention of the American Psychological Association, Washington DC.

Chandler, H.K., Marotta, M.M., McLendon, W.R., & Clum, G.A. (1999). Effect of Positive and Negative Coping Strategies on Psychological Outcome. International Society for Traumatic Stress Studies 15th Annual Meeting, Miami, FL.

Chandler, H.K., Rhatigan, D.L., Moore, T.M., & Eisler, R.M. (1999). Effect of Abuse History On Women's Behavioral Responses To Male Threat. Association for the Advancement of Behavior Therapy, Toronto, Ontario.

Chandler, H.K., Marotta, M.M., McLendon, W.R., & Clum, G.A. (1999). Coping with Trauma: Relationship Between Coping Strategies and Mental Health Outcome. Association for the Advancement of Behavior Therapy, Toronto, Ontario.

Chandler, H.K., & Safer, M.A. (1998). Personality as a mediator of change in memory of emotional events. Virginia Collegiate Psychology Conference, Blacksburg, VA.

Kehoe, P., Chandler, H., Skipsey, K., and Clash K. (1993). Infant rats' dopaminergic response to the stress of isolation in a novel environment. Washington, DC. *Society for Neuroscience Abstracts, Vol. 19.*

Chandler, H. & Kehoe, P. (1993). Isolation produces an increased striatal dopamine turnover in rat pups. *Proceedings and Abstracts of the Annual Meeting of the Eastern Psychological Association, 64,* 36.

RESEARCH EXPERIENCE:

Graduate Research Assistant, *Virginia Tech, Blacksburg, VA, Aug 1997-May, 2001*
Collaborated with research team members on design, development, and implementation of anxiety and trauma-related research projects. Conducted three studies evaluating the cognitive, emotional, and health sequelae of traumatic events (see presentations). Worked with team members on metaanalysis of self-help treatments. Supervisors: Richard M. Eisler, Ph.D. & George A. Clum, Ph.D.

Measurements and Data Analyst, *Bell Atlantic Network Services, Inc., Silver Spring, MD***,** Sept., 1996-Aug., 1997. Company-wide consultant for measurement design and data analysis. Designed measures of performance, satisfaction, and training effectiveness. Analyzed data using SPSS, prepared written reports, recommendations, and presentations. Supervisor: Toni M. Hodges

Graduate Research Assistant, *Cognitive Science Lab., Catholic U. of America, Washington, DC.*, Oct., 1995-Jan., 1997. Conducted studies investigating age-related changes in visual attention and processing. Tested patients with Alzheimer's disease, participants from gene pools at risk for developing Alzheimer's, and volunteers from the normal aging population. Assisted with experimental design, implementation, and analysis. Director: Raja Parasuraman, Ph.D.

Research Team Leader, *Paradigm International, Potomac, MD*, Jun., 1996-Aug., 1996.
Coordinated workload and stress analysis of customer sales and service representatives. Developed coding categories, entered data, directed analysis and interpretation, and prepared

written reports. Published and presented research paper (see publications). Supervisor: Margaret T. Shaffer

Psychiatric Research Assistant, *Medfield State Hospital, Medfield, MA,* Jun., 1993-Aug., 1994.
Implemented Phase III trials of an anti-psychotic medication for schizophrenic outpatients. Administered the Structured Clinical Interview under supervision. Involved in writing and editing psychological and pharmacological research articles (see publications). Assisted with quality assurance data collection and analysis. Director: John J. Ratey, MD

Undergraduate Research Associate, *Psychobiology Laboratory, Trinity College, CT,* Aug., 1990-May, 1993.
Designed independent study investigating differences in the neurochemical effects of isolation stress on male and female neonatal rats using HPLC (see publications). Assisted with the design and implementation of experiments assessing behavioral, pharmacological, and neurochemical differences in stress response. Trained research assistants in animal care and laboratory methods. Director: Priscilla Kehoe, Ph.D.

CLINICAL EXPERIENCE:

Clinical Internship, *University of Medicine and Dentistry of New Jersey, Newark, NJ,* July, 2001-June, 2002.
Director of Clinical Training: Gerald Leventhal, Ph.D.
APA-accredited, one-year predoctoral internship. Rotations included outpatient psychotherapy with HIV+ individuals, partial hospitalization program, neuropsychological assessment, psychological assessment, consultation/liaison psychology, oupatient psychotherapy with victims of violence, and pain management. Systems intervention research project evaluated therapeutic and fiscal benefits of employing case coordinators to facilitate the treatment of adolescents with ADHD. Supervision provided from cognitive-behavioral, family systems, and psychodynamic perspectives.

Clinic Assistant, *VA Tech Psychological Services Center, Blacksburg, VA,* May, 2000-Aug., 2000
Supervisor: Lee D. Cooper, Ph.D.
Developed protocol for group treatment anger and stress management skills. Maintained case-load of seven clients, one anger management group, and two rolling integrated assessment clients. Provided supervision to group co-therapist. Conducted treatment from cognitive-behavioral, interpersonal, and family systems perspectives.

Clinical Extern, *Lewis Gale Pavillion, Salem, VA,* May, 1999-Aug., 1999.
Conducted group and individual therapy for psychiatric inpatients and outpatients with and without a co-therapist. Worked on the intensive treatment unit, adult inpatient unit, substance abuse unit, and adult outpatient unit. Conducted psychosocial intake assessments. Contributed to team-based treatment planning. Supervisor: John Todd, Ph.D.

Clinical Practicum, *VA Tech Psychological Services Center, Blacksburg, VA,* Aug., 1998- May, 1999.
Supervisor: George A. Clum, Ph.D., A.B.P.P. and Lee D. Cooper, Ph.D.
Managed caseload of seven clients, including individual, couples, and family cases. Incorporated interpersonal and family systems approaches into formulation and treatment of clients. Conducted adult and child psychoeducational assessments and adult personality assessment.

Clinic Assistant, *VA Tech Psychological Services Center, Blacksburg, VA,* May, 1998- Aug., 1998.
Supervisor: Thomas H. Ollendick, Ph.D.
Managed caseload of seven clients, including individual, couples, and family cases. Learned and implemented empirically validated cognitive-behavioral treatments of Panic Disorder and PTSD. Conducted adult and child psychoeducational assessments.

Clinical Practicum, *VA Tech Psychological Services Center, Blacksburg, VA,* Aug., 1997- May, 1998.
Supervisor: Richard M. Eisler, Ph.D
First year practicum. Learned basic clinical skills including assessment and diagnosis, rapport building, and chart management. Observed upper-level students conducting therapy. Managed caseload of one individual and one couple, and did co-therapy with a family. All clients treated from a cognitive-behavioral orientation. Conducted one child psychoeducational assessment.

Case Manager/House Parent, *The Learning Clinic, Brooklyn, CT*, Aug., 1994-Aug., 1995.
Managed cognitive-behavioral treatment for adolescents with emotional disturbances, suicidal ideation, developmental disabilities, learning disabilities, attention deficits, and hyperactivity. Involved in treatment planning, implementation of the residential program, and follow-up with the family. Completed Basic Medication Administration Certification course.

Assistant LD/ADD Support Group Facilitator, *Cambridge, MA*, Dec., 1993-Aug., 1994.
Assisted the establishment of psycho-educational support groups for professionals with Learning Disabilities and/or Attention Deficit Disorder. Compiled resource list and brochure of strategies to cope with LD/ADD. Analyzed data from pre- and post-group questionnaires.

Sexual Assault Counselor, *Women's Center, Trinity College, CT*, Aug., 1992-May, 1993.
Trained in basic crisis intervention techniques and their application to sexual assault and harassment. Counseled and referred assaulted students.

Resident Associate/Peer Substance Abuse Counselor, *Trinity College, CT,* Aug., 1991-May, 1992.
Provided campus-wide educational programs addressing collegiate substance abuse. Met weekly with college administrators to plan for events. Managed substance abuse budget and solicited further funds from private organizations. Counseled and referred students with substance abuse problems.

TEACHING EXPERIENCE:

Introductory Psychology Coordinator, *Psychology Department, Virginia Tech, Blacksburg, VA,* Aug. 1998-June, 2001.
Coordinated all administrative aspects of the 1200-student Introductory Psychology course. Provided support and feedback for lecturing professors and instructors of recitation sections. Substituted for instructors when necessary. Maintained extensive web site with lecture outlines, course information, and self-tests.

Graduate Teaching Assistant, *Virginia Tech, Blacksburg, VA,* Aug. 1997-May, 1998.
Taught three Introductory Psychology recitation sections. Covered lectured material in depth with current articles, and provided hands-on experiences in the classroom.

Teaching Assistant, *General Psychobiology Laboratory, Trinity College, CT*, Aug., 1992-Dec., 1992.
Assisted in the preparation of 12 laboratory sessions for 18 undergraduates. Demonstrated handling of animals, neurological testing, electrolytic brain lesioning, injections, taste aversion experiments, brain perfusion, brain removal, and histological techniques. Assisted with assessment of student performance.

Teaching Assistant, *Child Development, Trinity College, CT*, Aug., 1992-Dec., 1992.
Provided feedback on reading worksheets, article summaries, and papers for 37 students. Produced guideline and conducted individual sessions with students to revise papers and projects.

PROFESSIONAL AFFILIATIONS:

American Psychological Association:	1995-present, Student Affiliate. 1998-present,APAGS representative.
American Psychological Society:	1995-present, Student Affiliate.
Association for the Advancement of Behavior Therapy:	1999-present, Student Affiliate.
International Society for Traumatic Stress Studies.	2000-present.
South Eastern Psychological Association:	1999-present, Student Affiliate.

COMPUTER SKILLS:

Proficient in both Windows and Macintosh environments, SPSS, Statistica, Super ANOVA, StatView, SuperLab, Cricket Graph, Microsoft Office (Word, Excel, Access, Powerpoint), web page maintenance.