

An Internet-Based Self-Change Program for Trauma Sequelae

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Dissertation submitted to the Faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

in

Psychology

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November 19, 2002
Blacksburg, Virginia

Keywords: self-help, trauma, PTSD, Internet, treatment

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(ABSTRACT)

The purpose of this study was to examine whether a newly developed Internet-based, eight-week self-change program, Self-Help Intervention Program for the Consequences of Trauma (SHICT), was effective to treat trauma consequences. The SHICT consisted of education, anxiety management skills, cognitive restructuring, and exposure modules that included writing exposure and in vivo exposure. It also provided a mastery approach where individuals begin treatment with the least anxiety-provoking component (i.e., relaxation) and progress to the most fearful component (i.e., exposure). This approach was employed to ensure that trauma victims learn and become skilled users of anxiety-reducing coping techniques and decrease the likelihood of untoward responses to writing exposure. Thirty-three participants were randomly assigned to either a SHICT condition or a wait-list condition and 27 completed participation. Trauma-related symptoms, state anxiety, depression, coping skills, social support, and self-efficacy were assessed at pre and post-treatment. Results indicated that overall the SHICT group reduced symptoms and increased coping skills more significantly than the control group. Particularly, individuals in the SHICT group decreased intensity and frequency of avoidance behavior, frequency of intrusion, state anxiety, and depression more significantly than those in the control group. The SHICT group also increased general coping skills and coping self-efficacy more significantly than the control group. The SHICT produced medium to large effect sizes in many symptom and coping-related measures. The SHICT group demonstrated more clinically significant improvement than the control group in several symptom and coping-related measures. Increased coping self-efficacy and perceived social support levels and decreased wishful thinking coping were significantly correlated with symptom improvement. Both exposure and cognitive skills mastery levels were significantly correlated with decreased intensity and frequency of avoidance behavior.

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Introduction

Prevalence of traumatic events and PTSD

Recent surveys on the prevalence of traumatic events and PTSD in the general population (Foa, 1997; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Norris, 1992; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993) reported rates of lifetime exposure to any type of traumatic events from 50% to 69%, and rates of PTSD from 2 to 14%. One national survey (Kessler et al., 1995) reported exposure rates for a variety of traumatic events, including witnessing (35.6% for men and 14.5% for women), natural disasters (18.9% for men and 15.2% for women), accidents (25.0% for men and 13.8% for women), rape and sexual molestation (3.4% for men and 21.4% for women), and combat (6.4% for men and 0% for women). Although these trauma victims need to receive adequate care, reluctance of trauma victims to seek mental health treatment has been reported (Solomon & Davidson, 1997). Reasons for this reluctance may include high cost of therapy, restriction of access to therapy, or fear of stigmatization produced when face to face with a therapist. Alternative treatment modalities, such as self-administered treatments, could increase the availability of interventions for those individuals who are reluctant to reach out to conventional mental health services.

Effectiveness of self-help

Self-help approaches offer a low cost and resource-expanding alternative to victims of trauma. According to stepped care models for psychological disorders (e.g., Haaga, 2000; Newman, 2000; Wilson, Vitousek, & Loeb, 2000), self-help approaches are appropriate interventions to use as a first step in such models because of their low cost and high accessibility. These authors suggest that self-help approaches can increase the number of individuals that are offered treatment by offering a low-cost alternative that often can be accessed from one's home. An important issue in determining the feasibility

of such interventions is whether or not they are effective and how their effectiveness compares with treatments offered through more conventional venues.

A number of recent controlled treatment outcome studies have reported the effectiveness of cognitive behavioral self-help approaches when used to treat a variety of psychological problems, including phobias (Rosen, Glasgow, Barrera Jr., 1976), generalized anxiety disorder (Bowman, Scogin, Floyd, Patton, & Gist, 1997), panic attacks (Gould & Clum, 1995; Gould, Clum, & Shapiro, 1993; Febraro, Clum, Roodman, & Wright, 1998; Hecker, Losee, Fritzier, & Fink., 1996; Parry & Killick, 1998; Lidren, Watkins, Gould, Clum, Asterino, & Tulloch, 1994; Wright, Clum, Roodman, & Febraro, 2000), depression (Bowman, Scogin, & Lyrene, 1995; Smith, Floyd, Scogin, & Jamison, 1997; Jamison & Scogin, 1995; Osgood-Hynes et al., 1998), obsessive-compulsive disorder (Fritzier, Hecker, & Losee, 1997), insomnia (Mimeault & Morin, 1999), nightmares (Burgess, Gill, & Marks, 1998), and other types of anxiety disorders and maladaptive behaviors (Chadler, Wallace & Wessely, 1998; Tyrer et al., 1990; White, 1995). Two recent meta-analytic studies (Gould & Clum, 1993; Marrs, 1995) concluded that self-help approaches are effective for some types of psychological symptoms, such as panic disorder, phobic avoidance, anxiety, depression, and other behavioral problems. These meta-analytic studies reported the effect sizes of .87 for overall SH interventions and 1.11 for fear reduction (Gould & Clum), and .91 for anxiety disorder (Marrs). However, an extended database search revealed that, to date, only one controlled outcome study (Lange, van den Ven, Schrieken, & Emmelkamp, 2001) has investigated the effectiveness of self-administered treatment for trauma-related symptoms. In this online study, however, frequent feedback and instructions were provided by therapists through the Internet, thus diluting the purity of its self-help nature. The paucity of research in self-help interventions targeting trauma-related symptoms is presumably due to the

assumption that the consequences of trauma are not amenable or appropriate to self-change approaches, as some researchers suggested (Matsakis, 1992; Winder, 1996). A web site offering a variety of self-help programs for anxiety disordered individuals (www.anxieties.com, by Wilson Ph.D.) does not offer a self-help program for the consequences of trauma; then recommends professional help because of “the complexity of the disorder.” However, these conclusions have not been empirically or theoretically grounded and, therefore, remain in question.

The advantageous features of self-help approaches for trauma-victims are similar to those outlined earlier for self-help treatments in general. They include: 1) cost-effectiveness of self-help approaches for trauma victims who therefore may be more likely to remain in therapy; 2) accessibility of self-help materials for trauma victims who are more likely than individuals with other diagnoses to miss treatment sessions (Sparr, Moffitt, & Ward, 1993); and 3) the anonymity provided by self-help treatments, especially important for specific types of trauma. Further, as Kanfer (1980) stated in his examination of the self-management model, individuals using self-help approaches are likely to increase their experience of mastery, competency, motivation and personal responsibility for behavioral change. This latter advantage is important for PTSD sufferers, as Foa & Rothbaum (1998) have argued that the mastery experience has idiosyncratic indirect therapeutic effects for trauma victims. Moreover, long-term maintenance of therapeutic effects in self-help interventions has been demonstrated (Smith, et al. 1997; White, 1998; Tyrer et al., 1993). In addition, Ellis (1993) stated that reading written materials repeatedly facilitates therapeutic gain faster than individual or group therapy.

Mechanisms of development of PTSD and treatment techniques

The mechanisms by which traumatic events consequate in PTSD has been addressed in recent theoretical papers. Information processing theory and its variant -- emotional processing theory (Foa &

Kozak, 1986) -- was originally proposed for explaining mechanisms of fear reduction for phobias based on Rachman's emotional processing (1980) and Lang's fear structure model. This theory indicates that similar fear activation mechanisms underlie anxiety disorders. Later, Foa, Steketee, and Rothbaum (1989) conceptualized PTSD as the product of traumatic events that create intense and erroneous connections among the information elements of feared stimuli, response elements and meaning elements in the fear networks. Consequently, PTSD develops after failure to engage in appropriate emotional processing to trauma stimuli. A variety of erroneous connections develop that lead to overestimates of the likelihood of negative consequences, leading individuals to become avoidant of fear-provoking situations. According to emotional processing theory, two critical conditions are responsible for determining treatment effectiveness: 1) whether fear networks are activated via the introduction of feared stimuli; and 2) whether corrective information is presented that is incompatible with the pathological elements and connections in the fear structure. As a result of these processes, a new, more appropriate memory can be formed.

Exposure techniques have been developed that fulfill the first condition and set the stage for fulfilling the second. According to information processing theory proposed by Foa et al (1989), for the second condition, exposure to a traumatic memory in a safe environment would help the individual reevaluate the environment and form a new memory. Cognitive processing therapy (Resick & Schnicke, 1992) emphasizes a cognitive approach for the second condition that provides direct confrontation with conflict and maladaptive beliefs in addition to eliciting memories of the traumatic event in order to form a new memory. The effectiveness of exposure techniques and their variations, such as imaginal exposure, in vivo exposure, writing exposure, with and without cognitive components, which seem to fulfill the above two conditions, have been demonstrated in a number of studies (Boudewyns &

Hyer, 1990; Boudewyns, Hyer, Wood, Harrison, & McCranie, 1990; Bryant, Harvey, Dang, Sackville, & Basten, 1998; Chemtob, Novaco, Hamada, & Gross 1997; Cooper & Clum, 1989; Devilly & Spence, 1999; Devilly, Spence, & Rapee, 1998; Echeburua, de Corral, Sarasua, & Zubizarreta, 1996; Fecteau, & Nicki 1999; Foa, Dancu, Hembree, Jaycox, Meadows, & Street, 1999; Foa, Hearst-Ikeda, & Perry, 1995; Foa et al., 1995; Foa, Rothbaum, Riggs, Murdock, 1991; Glynn et al., 1999; Hickling & Blanchard, 1997; Jensen, 1994; Keane, Fairbank, Caddell, & Zimering, 1989; Marks, Lovell, Noshirvani, Livanou, & Thrasher, 1998; Pantalon & Motta, 1998; Pitman, Orr, Altman, Longpre, Poire, Macklin, & Michaels, 1996; Pitman, Orr, Altman, Longpre, Poire, Macklin, Michaels, & Steketee, 1996; Resick & Schnicke, 1992; Richards, Lovell, & Marks., 1994; Rothbaum, 1997; Scheck, Schaeffer, & Gillette, 1998; Tarrier et al., 1999; Vaughan et al., 1994; Vaughan & Tarrier, 1992). One meta-analytic study (Sharman, 1998) reported the average effect size of 10 exposure studies at post-treatment was .56 and one cognitive processing therapy study had effect sizes of .85 at post-treatment.

Two issues must be addressed before applying treatment solutions to trauma sequelae, including PTSD, via the self-help modality. These issues include: 1) the presence of avoidance behavior; and 2) the presence of complicating comorbid disorders among PTSD sufferers. Avoidance behavior for confronting fear information may impede activating the deeper fear networks, a key element of the treatment process. Willingness to confront the feared traumatic events may also be reduced by the presence of substance use, depression, psychosis or other mental illness. Some general features of personality disorders, such as lack of emotional engagement, the presence of deviant emotional reactions, and lack of impulse control, are likely to impede therapeutic gain. Accordingly, self-help programs that utilize self-administered exposure to previously-avoided traumatic events must address

and minimize these elements. Particularly important is the decision of how to administer the exposure component in a self-help format in a way that maximizes motivation and minimizes resistance.

In psychological treatments for PTSD that employ individual or group therapy, imaginal or in vivo exposure has been used to introduce fear-relevant information and activate the erroneously connected fear networks (Foa et al., 1989). In Cognitive Processing Therapy (CPT; Resick & Schnicke, 1992), originally developed for rape victims in group settings, however, the exposure component is provided through writing about and reading about the traumatic events. This exposure element is conducted mostly at home as part of homework assignments without a therapist's assistance. Writing exposure has been discussed by Esterling, L'abate, Murray, and Pennebaker (1999), who identified several advantages: 1) writing about an event makes individuals able to recall more dimensions of the traumatic experience, and thus, the event becomes more chronically accessible; 2) writing may alter the way the event is organized in memory; and 3) writing helps individuals transform unclear feeling states into conscious verbal labels, reducing perceived intensity of emotion. One recent study (Schoutrop, Lange, Hanewald, Davidovich, & Salomon, 2002) reported that individuals who received writing sessions about a traumatic experience significantly decreased intrusions and avoidance behavior compared to people in the waiting list. Lange et al., (2001) also included writing exposure as a major therapeutic component in the online program for trauma victims and reported significant decreases in symptoms among individuals who received the treatment compared to those in the wait-list control group. The above findings support the validity of writing as an exposure technique. An examination of the adaptability of writing exposure to the self-help modality supports the use of this approach.

In- as- much as exposure to previously- avoided trauma stimuli produces anxiety, the inclusion

of treatment elements that reduce this anxiety will minimize both avoidance and negative responses to the exposure process itself. Ensuring that trauma victims learn and become skilled users of anxiety-reducing coping techniques decreases the likelihood of untoward responses to writing exposure. The use of a mastery approach is one way to increase treatment adherence and decrease negative response to treatment. In this approach, individuals begin treatment with the least anxiety-provoking component (i.e., relaxation) and progress to the most fearful component (i.e., exposure). Progression to the exposure phase of treatment is predicated on the successful acquisition of relaxation and cognitive restructuring coping skills. As Foa and Rothbaum stated (1998), anxiety management skills help individuals control anxiety and develop greater tolerance for remembering the fearful traumatic memory for longer periods of time. Cognitive restructuring helps individuals focus specifically on cognitive dysfunction without activating intense fear and discomfort. Cognitive restructuring elements can be used to deal with catastrophic and negative beliefs, which trauma victims are likely to experience. After completing these less threatening treatment components successfully, trauma victims are likely to become confident and motivated to deal with their symptoms and more willing to confront their deeper fear structures.

Internet and treatment

Choosing the media for providing self-help interventions is important, with a computer-based, Internet delivery approach being the best choice for trauma victims. There is ample evidence that computerized self-administered assessment and interventions are effective for a variety of psychological disorders and emotional distress. Bloom (1992) concluded that cognitive components, relaxation techniques, and exposure elements for a variety of psychological problems have been successfully implemented in computerized programs. Symptoms that have been successfully targeted by

computerized or internet-based cognitive behavioral self-help programs include anxiety, phobias, depression, panic, GAD, OCD, sexual dysfunctions, and other behavioral problems (Bloom, 1992; Klein & Richards, 2001; Marks, Shaw, & Parkin, 1998; Wright & Wright, 1997). For example, two controlled self-help studies (Carlbring, Westling, Ljungstrand, Ekselius, & Andersson, 2001; Klein & Recharads, 2001) reported the significant effect of online programs for treating panic disorders. Lange et al (2001) reported significant reductions on symptoms and other psychological distress among individuals who received the online treatment with therapist directions. Reliability and ease of administration of computerized assessments for a variety of psychological disorders have also been shown (Meszaros, Engelsmann, Meterissian, & Kusalic, 1995; Peters, Clark & Carroll, 1998; Hourani, & Yuan, 1999; Kovera, Anger, Campbell, & Binder, 1996; Neal, Fox, Carroll, Holden, & Barsed, 1997; Bloom, 1992; Peters et al. 1998).

The Internet can provide therapy for those who live in remote areas, have physically restricted mobility, or are afraid to seek face-to-face therapy due to anxiety or stigmatization. Further, internet-based programs can provide immediate feedback and individualized intervention modules for users. Immediate feedback is an important feature to enhance the effectiveness of treatment, as suggested by a positive relationship between the presence of feedback and therapeutic gain in self-administered interventions reported by a recent study (Febbraro & Clum, 1994). Tailoring is important to deal with differences among individuals on symptomatology, treatment strategy preferences, and speed of skill acquisition and application. Technical feasibility to include these functions was demonstrated in recent online treatment studies (Carlbring et al., 2001; Klein & Recharads, 2001). Self-help in general can provide individuals with opportunities to process treatment at their own pace rather than following a fixed schedule as common in a group treatment setting. Online interactive programs have more potential

for flexibility in providing tailoring function, individualized intervention elements based on their symptomatology and treatment strategies preference. In addition, on-line programs can provide individuals with e-mail as a means of communication with treatment providers, such as researchers. The advantages of e-mail contact over postal mail include the speed with which it is delivered, the cost, and the flexibility of time for communication (King, Engi, & Poulos, 1998). Online communications can quickly detect emergency or urgent care the client needs. As Murphy and Mitchell (1998) stated, e-mail can communicate non-verbal cues, and thus, it is likely that researchers are able to detect any emergencies the client is facing. Lastly, online programs allow researchers to immediately store, retrieve, and analyze data.

Recent advanced communication technology has been expanding the accessibility of the Internet for individuals at a low access cost (e.g., \$5.95 per month for unlimited time by Access4Less). In the most comprehensive survey to date, the U.S. Census Bureau (2001) found that in August of 2000, 54 million households (51%) had home computers and that 80 percent of these households have Internet access. The Nielsen Ratings for October, 2001 reported that 169.4 million individuals had access to the Internet (2001).

The above findings suggest that Internet-based programs have much to recommend them for the delivery of cognitive behavioral self-help interventions in the treatment of trauma sequelae.

Variables associated with symptom severity and treatment outcome

Coping strategy, coping self-efficacy, and social support are factors that may be associated with treatment outcome. A second goal of the study, therefore, was to examine the effects of treatment on these variables as well as to determine the relationships of change on these variables to treatment outcome.

According to coping theory (e.g., Lazarus & Folkman, 1984) coping response to stressful events have both immediate and long-term effects. Given that some trauma victims recover quickly from the traumatic event and others develop severe symptoms, the possibility exists that coping skills partially mediate that differential response. The acquisition of positive coping skills, therefore, may be an important factor in predicting treatment outcome. On the other hand, negative coping strategies, such as wishful thinking have been shown to be associated with severity and duration of trauma-related symptoms (Dougall, Ursano, Posluszny, Fullerton, & Baum, 2001; Valentiner, Foa, Riggs, & Gershuny, 1996). Not only actual use of coping strategies, but also perceived self-confidence to apply these skills, may be related to reductions in PTSD symptomatology. For example, Bandura (1997) stated that perceived coping efficacy plays an important part in the recovery from trauma sequelae. In support of this contention, recent research studies (Benight, Swift, Sanger, Smith, & Zeppelin, 1999; Benight et al., 1997) reported that greater levels of coping self-efficacy were related to lower emotional distress and PTSD symptoms in people who experienced a natural disaster. In addition, self-efficacy likely enhances trauma victims' participation in self-help intervention. One recent study (Carpinello, Knight, Markowitz, & Pease, 2000) reported positive associations between involvement in self-help treatment and self-efficacy beliefs .

Finally, improvement in social support levels may predict symptom improvement in individuals with trauma sequelae. One recent study with trauma victims (Jacobson et al., 2002) reported that social support levels affected PTSD symptoms. Another recent study with victims of motor vehicle accidents (Dougall et al., 2001) reported that perceived availability of social support was associated with absence of trauma related symptoms at 6 and 12 months after the event. Further, social support may be an important factor in the participation of self-help interventions. According to Bandura (1997),

social support by family members and friends can increase perceived self-regulatory efficacy. Thus, individuals who perceive social support may be able to increase self-regulatory behavior and better adhere to self-help treatment protocols.

Hypotheses

In the current study, an Internet-based, 8-week self-help group and a wait-list control group were compared to test the following hypotheses.

- 1) Trauma victims in the treatment group will experience a significant reduction in trauma-related symptoms, anxiety, and depression from pre- to post-treatment when compared to those in the control group.
- 2) Trauma victims in the treatment group will increase their use of positive coping skills, and coping self-efficacy from pre- to post-treatment significantly more than those in the control group.
- 3) A greater proportion of trauma victims in the treatment group will demonstrate clinically significant improvement, than will trauma victims in the control group.
- 4) Increased positive coping strategies, perceived social support, and coping self-efficacy will be associated with lower symptom scores at post-treatment.

Method

Participants

Participants were 33 individuals who met the screening criteria. Inclusion criteria required that individuals be 18 years of age or older, have at least one traumatic event, report both re-experiencing and avoidance symptoms that are associated with the traumatic event, and be familiar with computers, email, and the Internet. Participants were required to reside in the United States. Participants were also required to have a minimum of a 9th grade education. In fact the lowest grade level completed was

reported as a 12th grade education. Exclusion criteria included: 1) self- report of previously diagnosed organic brain disorder or psychotic disorder; 2) the presence of ongoing treatment(s), such as other forms of psychological treatment or medical treatment; 3) the presence of imminent suicidal threat; and/or 4) the presence of target symptoms associated with a history of childhood sexual abuse or combat. The exclusionary criterion of being on medication was waived if a participant: 1) reported he/she had been on medication more than one month and 2) agreed not to change medication until he/she completed the program.

Demographic information and event characteristics of the 33 individuals who began treatment is provided in Table 1. Eighteen participants were recruited from communities and 13 were from the Virginia Tech student pool. Participants consisted of 7 men (21.2%) and 26 women (78.8%). Twenty-seven (81.8%) were Caucasian, 2 (6.1%) were African American, 2 (6.1%) were Asian, and 2 (6.1%) identified themselves as “Other.” Twenty-one (63.6%) were single, eight were married (23.2%), 3 (9.1%) were divorced, and 1 (3.0%) endorsed “Other.” Seventeen participants (78.8%) reported having had some college and 6 participants (18.2%) reported having some post-graduate education. Nineteen (57.6%) of the current sample were students, 9 (24.2%) were employed, 5 (15.2%) were unemployed, and 1 (3%) identified as other. Six participants (18.2%) reported taking medication. At the initial assessment, 26 lived in Virginia, 1 in California, 1 in Delaware, 1 in Georgia, 1 in Maryland, 1 in New Jersey, 1 in New York, and 1 in Texas.

Measures (Appendix A)

Online assessment instruments

Demographic information: This measure included name, address, telephone number, birth date, race, education, occupation, marital status, current treatment, and medication.

Stressful Experience History: The SEH (Clum, 1999) has 19 items, investigating an individual's history of traumatic experience. Individuals were asked to indicate the number of times that specific stressful events had occurred in their lifetime, whether the events were life-threatening, and whether the individual experiencing the event was treated at the time of the event. In addition, individuals were asked to provide a brief description of the stressful event that produced symptoms to be targeted via the web-based treatment program.

Stressful Responses Questionnaire: The SRQ (Clum, 1999) has 22 items, designed to measure symptoms associated with PTSD. Individuals indicated the frequency of each symptom and level of distress associated with each symptom *in the past month* on a 5-point Likert scale (0 - 4). The frequency scale (SRQF) ranges from "Have not experienced this in the past month" to "Have experienced this five or more times a week." The level of distress scale (SRQD) ranges from "Does not upset me" to "Upsets me extremely." Chandler & Clum (personal contact) reported a 3-factor solution for the frequency scale, including subscales of Intrusion (SRQFIN: 11 items), Avoidance (SRQFAV; 6 items), and Arousal (SRQFAR; 5 items). Factor analysis of the Distress Scale revealed a 1-factor solution. The reliability as measured by Cronbach's alpha was .93 for the SRQFIN, .85 for the SRQFAV, .76 for the SRQFAR, and .95 for the SRQD. Higher scores reflect more symptoms and distress. Factor scores for the SRQF were used for analyses in the current study.

Active Coping with Trauma Scale: The ACTS (Clum, 1999) has 69 items and measures frequency of use of individuals' coping strategies for traumatic events. Responders indicate how often they use or practice the coping strategies currently on a 4-point Likert scale (1 - 4), ranging from "Never" to "Frequently." Two recent studies (Chandler & Clum, 2000a; Chandler & Clum, 2000b) reported a 4-factor solution, that included subscales of General Strategy (i.e., cognitive, relaxation and

positive distraction strategies) (ACTSGS: 17 items), Wishful Thinking (ACTSWT: 15 items), Active Recall and Information Seeking (ACTSRI:15 items), and Social Support Seeking (ACTSSS: 9 items) subscales. Thirteen items were not included in any factors. The reliability estimate measured by Cronbach's alpha was .90 for the ACTSGS, .73 for the ACTSWT, .83 for the ACTSRI, and .58 for the ACTSSS (Chandler & Clum). Higher scores reflect that the indicated coping strategies were used more frequently. Subscale scores were used in the present study.

Social Support Questionnaire Part A: The SSQA (Clum, 1999) has 22 items, designed to provide general assessment of social support. Responders evaluate how supported they feel by others on a 5-point Likert scale (0 - 4), ranging from "Never" to "All the time". One recent study (Chandler & Clum, 1999) reported a reliability estimate using Cronbach's alpha of .79. Higher scores indicate higher perceived social support.

Self-Efficacy Scale: The SES was a newly developed scale to assess individuals' self-efficacy for dealing with anxiety-provoking situations. This scale was based on Bandura's guidelines for constructing self-efficacy scales. Responders were asked if they would use their coping strategies to deal with a specific situation and evaluated their self-efficacy using a 0-100 scale with 0 reflecting a judgment of "Cannot do at all" and 100 reflecting a judgment of "Certain can do." Higher scores suggest higher self-efficacy for coping with anxiety-producing situations.

Assessment Instruments Sent By Mail

The following questionnaires were sent to participants by postal mail because copyright permission was not extended for using them online.

State Trait Anxiety Inventory-State Scale (STAI-S; Spielberger, Gorsuch, & Luschene, 1970): The State Anxiety scale consists of twenty statements that evaluate feelings of apprehension,

tension, nervousness, and worry “right now, at this moment.” Individuals respond to each item on a 4-point Likert scale of “Not at all,” “Somewhat,” “Moderately,” and “Very much so.” Strong internal consistency ($\alpha = .90$) was reported by Spielberger et al. Higher scores indicate higher state anxiety.

Beck Depression Inventory-II (BDI-II, Beck, Steer, & Brown, 1996) The BDI-II consists of 21 items that assess the intensity of depression in clinically depressed and normal individuals. Each item is a list of four statements arranged in increasing severity that reflect a specific symptom of depression. Adequate psychometric properties of the BDI-II were reported, including a coefficient alpha of .92 (Beck, Steer, & Brown, 1996).

Impact of Event Scale Revised (IES-R, Weiss & Marmar, 1997): The IES-R is a self-report measure designed to assess current subjective distress for specific traumatic or stressful life events. The IES-R has 22 items that measure distress levels of Avoidance (IESRA), Intrusions (IESRI), and Hyperarousal (IESRH). Respondents were asked to rate each item on the IES-R on a scale of 0 (not at all), 1 (a little bit), 2 (moderately), 3 (quite a bit) and 4 (extremely) according to their experiences in the past 7 days. The internal consistency of the intrusion scale ranged from .87 to .92; of the avoidance scale ranged from .84 to .86; and of the hyper-arousal scale ranged from .79 to .90 (Briere, 1997).

Diagnostic Interview

SCID-IV PTSD Module (First, Spitzer, Gibbon & Williams, 1995): the SCID-IV is a semi-structured diagnostic interview designed to determine DSM-IV (APA, 1994) diagnoses. All items in the PTSD section were administered in the current study. The SCID-IV PTSD module assesses the presence or absence of each DSM-IV PTSD symptom. Reliability and validity of the PTSD diagnosis in general has been established. Kappas for SCID PTSD range from .68 to .93 (Kulka et al., 1990; Skre, Onsted, Torgerson, & Kringlen, 1991). In addition, Kulka et al. demonstrated convergent validity

with the IES (Horowitz, Wilner, & Alvarez, 1979) and the Mississippi Scale (Keane, Caddell, & Taylor, 1988). This interview was given at the post-treatment point of the study, and asked participants to identify whether or not they were experiencing symptoms of PTSD for the period immediately prior to entering the study. Retrospective interview methods have been used in a recent self-help research study (Febbraro, Clum, Roodman, & Wright, 1999) in order to minimize therapist contact during the treatment phase. A kappa coefficient for retrospective diagnosis of panic disorder in the Febbraro, et al study was 1.00.

Procedures

Participants were recruited via the Internet from across the United States as well as the introductory psychology pool at Virginia Tech. Flyers, email, homepages on the Internet, newsgroups on the World Wide Web, and advertisements in local newspapers and radio stations were used to recruit participants. Flyers were posted at a variety of places, such as hospitals, clinics, women's shelters, churches, apartment complexes, grocery stores, community centers, universities, and community colleges. Information of the study's purpose, eligibility and ways to reach the investigator were described (Appendix B). In addition, students were recruited via the online experiment sign-up site provided by the psychology department at Virginia Tech.

Individuals who responded to the media postings were contacted by phone for the full eligibility screening (Appendix C). In this interview potential participants were asked about their target traumatic experiences and symptoms, familiarity with the computer and Internet access, and the presence of the conditions that serve as exclusion criteria. Individuals who met all of the inclusion criteria and none of the exclusion criteria were allowed to participate in this study. If the individual reported significant suicidal thoughts or self-mutilating behaviors but was not currently receiving treatment for his/her

emotional problems, he/she was asked to seek emergency treatment.

Initially, 93 individuals responded by email to the media posting. Seventy were from communities and 23 were students. Of the 93, 78 were contacted by phone for the full eligibility screening. Of the 93, 15 individuals were not reachable because they did not answer calls or emails. Of the 78 who were contacted by phone, 42 individuals, 26 from the community and 16 from Virginia Tech's student population, were eligible. Thirty-six individuals were not included due to lack of interest ($n = 1$), lack of traumatic events or symptoms ($n = 11$), in therapy for symptoms ($n = 11$), severe symptoms due to childhood sexual abuse ($n = 4$), and living outside the United States ($n = 9$). Of those who reported no traumatic event, one individual living in Blacksburg who reported severe depressive symptoms, was encouraged to contact the Psychological Services Center and given the contact number. Of those who reported childhood sexual abuse and thus were not qualified to participate, one individual who reported a long history of self-mutilating behaviors secondary to childhood sexual abuse experiences but was not in treatment at that time was encouraged to re-contact the therapist she had previously seen.

Individuals deemed appropriate for the study were sent an informed consent form (Appendix D), the STAI-State, BDI-II, IES-R, and a stamped self-addressed envelope by postal mail. Those who wished to receive the informed consent form and questionnaires by email were provided them via this venue. While these individuals were allowed to return the questionnaires by email, their signed informed consent was returned directly to the experimenter. Of the 42 eligible individuals, 36 individuals, consisting of 20 adults from the community and 16 students, returned their signed informed consent and questionnaires.

Individuals were classified as having experienced either an interpersonal traumatic event (e.g.,

physical or sexual assault) or an impersonal event (e.g., natural disaster, car accident). Individuals from each classification were randomly assigned to either the treatment group or wait-list control group. Initially, 18 individuals were assigned to the treatment group and 18 to the control group; however, three in the control group did not begin the online assessment after returning their initial paper questionnaires. Therefore, 33 individuals, consisting of 18 in the treatment group and 15 in the control group began treatment.

Participants assigned to the treatment group were provided with the web-site address for treatment and given brief written instructions by email to start the program after they had read the detailed instructions on the website. Participants who were assigned to the wait-list control group were provided with the web-site address, given brief written instructions for completing the assessment, and informed that they could begin the treatment program after an 8-week wait-period. A user ID and password were created by each individual when the individual first visited the site. Each participant was required to use a personal code number to access the assessment and treatment areas of the site. The individual personal code was printed on the informed consent form and was also sent to the participant by email.

First time participants in both groups completed the demographic questionnaire, the SEH, SRQ, ACTS, SSQA, and SES online, in this order, at the initial assessment. After this initial assessment, the treatment group became able to access the self-administered treatment modules.

Individuals in each group were prompted by email to complete the assessments at four and eight weeks. The assessment instruments administered at the four and eight-week follow-ups included only the online measures minus the demographic questionnaire and the SEH. Also, at four and eight weeks the BDI-II, STAIS, IESR, and a stamped, self-addressed envelope were sent to participants by postal

mail. Those who wished to receive and return the questionnaires by email were allowed to do so. After post-treatment, the SCID-IV PTSD module was administered by phone to assess the presence of PTSD prior to starting the program.

Participants in the waiting-list group were asked to start the intervention after this post-treatment assessment. The self-help program and assessment procedures for these individuals were the same as those given to participants in the treatment condition.

If participants were recruited from the Introductory Psychology Pool at Virginia Tech, they received three (3) extra credit points for their completion of the three assessments (one point each for pre-treatment, midpoint, and post-treatment), regardless of which group they were in. In addition, if they were in the treatment group, they received three (3) extra credit points for their regular access to each of the three treatment modules for 8 weeks, three (3) extra credit points for their attempts on each of the three mastery tests, and one (1) extra credit point for their contract to complete the follow-up assessment. Therefore, students in the treatment group could receive up to 10 points. If students were in the control group they could receive two (2) extra credit points if they started treatment after the 8-week wait period.

Emergency procedures were set up to deal with several different situations. Individuals who evidenced any of the exclusion criteria were immediately instructed by email to drop the program and seek adequate help. If the person was a student of Virginia Tech, he/she was encouraged to seek help at the Psychological Services Center (540-231-6914), the Counseling Center (540-231-6557), or RAFT (540-961-8400). If the participant was outside of the Blacksburg, Virginia environs, the investigator immediately initiated a search to find someone in his/her geographical area with expertise in anxiety disorders and provided him with that information. The participant was also informed of the

availability of the National Mental Health Association (1-800-969-6642) as a referral source in the United States for respected mental health professionals. In the case of an acute emergency situation, participants were encouraged to call the National Hopeline Network (1-800-SUICIDE or 1-800-784-2433) to reach a certified crisis center 24 hours a day, seven days a week. Should a participant require such intervention his/her access permission to the web program was deleted by the webmaster. No participant required any of the above measures.

Therapist contact was made in several occasions. If the participant had not completed the assessment as scheduled, email, including the site address and a brief statement of assessment schedules, was sent. If the participant did not complete the assessment within a few days after the first email, the investigator called the participant to prompt him/her. For a participant who completed the assessment or passed a mastery test on time, email, including a brief description of the next steps and schedules toward completion of the program was sent. All of the participants, regardless of which group they belonged to, were prompted at least one time by email to complete the assessment or mastery test. Six in the treatment group (2 student and 4 community samples) and 8 in the control group (3 student and 5 community samples) were prompted to complete assessments at least one time by phone. Overall, each participant received therapist-initiated emails approximately every other week. At each of these times participants were asked whether they were experiencing any exacerbated symptoms. None of the participants reported worsened symptoms or emergency situations.

Treatment

The Self-Help Intervention Program for the Consequences of Trauma (SHICT) is an 8-week internet-based computerized interactive program with e-mail contact. No therapeutic activities from the investigator were provided. The main intervention components consisted of education, anxiety

management skills, cognitive restructuring, and exposure modules that included writing exposure and in vivo exposure. Each module included rationales for the recommended procedures, instructions to practice each procedure, self-monitoring of practice, and goal-setting. The modules were written by the researcher using Microsoft FrontPage and Access and edited by her research supervisor.

The education module provides information about the consequences of trauma, including co-morbid disorders, and associated emotional distress. It included information that would be typically addressed by a therapist in the course of therapy. The anxiety management component provided information on how to conduct muscle relaxation, imagery-based relaxation, and diaphragmatic breathing techniques to control anxiety. This component was expected to allow individuals to better tolerate accessing the traumatic memory and anxiety typically associated with this process for longer periods of time. In the cognitive restructuring component, techniques for understanding the importance of cognitions (i.e., the process of identifying automatic negative thoughts that mediate between triggering situations and negative emotional states), and techniques for modifying these automatic negative thoughts, were taught. This component provided the individual with instructions for modifying negative cognitive processes to both general and traumatic event-specific themes. Writing exposure was a treatment component that assisted the individual in emotional reprocessing of the traumatic event. In this component, individuals were instructed to write about the details of the event(s) and their emotional responses to this event and then to read this account repeatedly. When possible, individuals were encouraged to enter situations that were associated with the traumatic event, particularly situations previously avoided. In-vivo exposures were recommended during the period of writing exposure. In in-vivo exposure, the individual was instructed to develop a hierarchy of avoided situations and to expose herself to these anxiety-provoking (but realistically safe) situations. Individuals were required to spend at

least one week practicing each module. Those who needed more time were allowed to spend as long as necessary at each treatment component rather than forcing them to move on to the next module.

Several downloadable forms intended as treatment aids (MS-Word), including forms to record self-monitoring of practice and goal-setting, were provided (Appendix E). In addition to instructions for using these forms, models showing how to use them were also provided on the website. Individuals were instructed to use these forms for their practice. These forms were expected to facilitate participants conducting the self-help program. Further, the email address of the researcher was provided on each page of the program. Individuals were allowed to contact the researcher by email when necessary (e.g., to ask questions about how to use the website, etc).

Emails were sent to participants every few weeks. Specifically, emails were sent that described treatment exercises they might have engaged in during the past several weeks and encouragement was provided to make more effort, if participants ; 1) had not engaged in treatment activities in the past 2 weeks (e.g., had not accessed the website); or 2) had failed to make progress (e.g., repeated failing the mastery level test for the module they were conducting). Details about mastery tests are described below. Participants received positive feedback and further encouragement when they made progress (e.g., completing one treatment component and passing a mastery test). Email was also used to detect potential problems such as suicidal ideation. No therapeutic instructions were given by email.

The SHICT provided a mastery approach that required participants to begin treatment with the education module followed by the anxiety management skills module. Next, participants learned cognitive restructuring followed by writing exposure and in vivo exposure. The mastery approach also required individuals to practice and master skills taught in a component prior to moving to the next component. To ensure that this process was followed by the participants, the mastery levels of each

treatment module were examined by interactive self-administered tests at the end of each of the anxiety management, cognitive restructuring, and exposure phases. The results of mastery tests were provided to the individual immediately on the website. Only the individuals who passed the tests received a code that allowed them to move to the next intervention component. Mastery of anxiety management skills and cognitive restructuring were prerequisites for proceeding to the exposure module. Individuals who had already passed the tests were allowed to repeat the previously-completed modules whenever they elected to do so.

The mastery level tests evaluated participants' knowledge about the strategies, the amount they practiced the strategies, and their confidence in the ability to apply the strategies (Appendix E). Knowledge about the strategies was assessed by questions that inquired about the rationales for and execution procedures of each of the intervention components. Validity of this approach to assessing mastery is supported by Bowman et al., (1997), who demonstrated that a multiple-choice mastery test administered at the end of treatment, was positively associated with therapeutic gain. The individuals' reports of how frequently they practiced and used the techniques taught in the treatment module were also included as part of the mastery test. Self-reports of completion rates of homework assignments and frequency of practicing intervention skills have been positively correlated with treatment outcome for PTSD (Marks et al., 1998; Richards et al., 1994). Reported confidence in the ability to conduct specific interventions was also a part of the mastery measure. The usefulness of this measure is supported by the relationship between self-efficacy for a particular activity and actual engagement in such activities (Bandura, 1997). Including the above items, the relaxation mastery consists of 36 items, composing of 18 knowledge item, 9 practice-competency items, and 9 confidence items, the cognitive mastery consists of 36 items, composing of 18 knowledge items, 9 practice-competency items, and 9

confidence items, and the exposure mastery test consists of 40 items, composing of 16 knowledge items, 10 practice-competency items, and 14 confidence items.

Cut-off scores for establishing that mastery had been achieved were based on several research studies. For example, Bowman et al. (1997) reported that the average rate of correct answers to the mastery tests in their study was 75%. Richards et al. (1994) reported that the average completion rate of homework assignments among improvers was 70%. In the present study, mastery was demonstrated when: 1) the individual responded correctly to 70% of the test items and 2) the individual completed 50% of assignments/requirements.

Data security

The investigator conducted all data management, analyses, and archiving tasks. Personal code numbers were used for all of the data analysis procedures. The security of data in the host computer and confidentiality were maintained by the webmaster (information technician at the psychology department). Specifically, user IDs and passwords were stored in a separate database from the main database housing individuals' personal data and only the webmaster was able to retrieve them. The investigator was able to edit the program modules and download stored assessment database by using a specific ID and password assigned by the webmaster. No one else was able to access the database.

Data analysis

The SPSS 10.0 program was used to perform data analyses. A statistically significant level was set at the level of an alpha = .05. The study compared an online intervention to a wait-list control with time nested in treatment. A pre-post design was used with assessment 8-9 weeks apart.

Results

Preliminary analyses

Of the 33 individuals who started the study, 27 completed it - 13 in the treatment group and 14 in the control group. Six participants, 5 in the treatment group and 1 in the control group, dropped out before completing the study. One terminated due to time constraints, three due to lack of interest (all were students), and two for unknown reasons. Total dropout rates were 18.2% total, 27.8% for the treatment group and 6.7% for the control group. Demographic information for the 27 completers is provided in Table 1. One-way ANOVAs and Pearson's chi square tabulations were performed to detect any differences among the treatment, control, and dropout groups on demographic variables, including age, ethnicity, marital status, education, occupation, and use of medication. Analyses demonstrated no significant differences among these three groups on any of the demographic variables or event characteristics.

Of 13 individuals in the treatment group, 4 student participants completed all treatment modules after approximately 6 - 7 weeks of treatment. These individuals completed assessments immediately after treatment and at the end of 8th week. All other participants in the treatment group utilized the full 8 weeks to complete the program. A series of paired-sample t-tests revealed no significant differences between scores at the early completion time and the end of the 8th week on any measures except for scores on the ACTSWT. The above results generally justify using these individuals' scores at the end of 8th week for the following data analyses.

Nine participants (69.2%) in the treatment group and 6 participants (42.9%) in the control group completed the midpoint online assessment. Specifically, in the treatment group, all 7 student participants and 2 community subjects completed the midpoint assessment. In the control group, all 5

student participants and 1 community participant completed the midpoint assessment. Those who did not complete the midpoint assessment were contacted by email and telephone during their 5th week; however, they were not compliant with the requests.

One participant who completed the control condition entered the treatment phase and completed the program. No other individuals started treatment after completing their wait period, listing time constraints ($n = 2$; 14.3%), lack of interest ($n = 9$; 64.3%), access problem ($n = 1$; 7.1%), and unknown ($n = 1$; 7.1%) as their reasons for not continuing. This individual was not included in the treatment group.

Trauma history

Results from the screening interview and the SEH were used to investigate the types of traumatic events participants experienced. One participant's SEH data was missing due to database trouble in the host computer that occurred during her data entry. Traumatic events reported in the SEH are presented in Table 2. At the pre-treatment screening interview, events targeted for treatment included, 9 (27.2%) car accidents, 8 (24.2%) episodes of interpersonal violence such as physical or sexual assaults, 3 (9.1%) witnessed traumatic events such as shooting, 6 (18.2%) experienced diseases, health problems, or injury, 6 (18.2%) experienced loss of significant others by murder or suicide, and 1 (3.0%) had an occupation-related accident. The most frequently endorsed event in the SEH was a car accident ($n = 13$), followed by sexual assault ($n = 11$) and having a person who was close killed ($n = 10$). The SEH revealed that the mean number of types of traumatic events experienced was 2.2 ($SD = 2.35$) and 71.9 % of the participants ($n = 21$) had experienced more than one type of traumatic event. The SEH also revealed that the mean number of traumatic events experienced was 6.6 ($SD = 7.50$). Participants' descriptions on the SEH of the stressful event to be targeted during the

intervention program were consistent with their responses at the screening interview with one exception. One person described her parent's divorce as the most traumatic event in the SEH, although witnessing a shooting was reported at the screening interview. After completing the online assessments, she emailed the researcher about the discrepancy due to some confusion and reported that the witnessed shooting event needed to be the target trauma.

The SEH revealed that those who reported a car accident as a traumatic life event thought that the accident was life threatening and 6 of them were injured and treated. Among those who reported interpersonal violence, six reported thinking they might be seriously injured or die and three of them were injured and treated. Two individuals who reported witnessing a traumatic event thought the event was life threatening, but none were actually injured or treated. Among those who reported disease, injury, or other health problems, four endorsed that the condition was life threatening and treatment was given. One individual in this category whose event was miscarriage reported that she did not endorse the health item in the SEH, because she did not think that it fit the event. Of those who reported relatives being killed, one person reported that she was seriously injured in the incident. The average duration since the occurrence of the target traumatic event reported by 27 completers was 4.0 ($SD = 6.4$), ranging from at least 1 month to 20 years. Sixty-three % of the participants ($n = 17$) reported that the event had occurred in the past year.

Retrospective interview

Of 27 individuals who completed the study, 24 were administered the SCID PTSD diagnostic interview by phone. None met criteria for PTSD. Failure to meet diagnostic criteria for PTSD was attributable to insufficient symptoms described under the avoidance or arousal criteria. Specifically, the average number of endorsed items in criteria B, C, and D are 2.8 ($SD = .76$) ranging from 2 to 4, 2.0

(SD = .59) ranging from 1 to 3, and 1.7 (SD = .91) ranging from 0 to 4, respectively. Three participants, one in the treatment group and two in the control group, were not administered the interview because, either the contact phone number was disconnected (n = 2) or the interview was refused (n = 1). Emails were sent to individuals whose phone was disconnected asking them to provide a contact number, but no responses were forthcoming. All three participants were in the community sample.

Descriptive statistics

Means and standard deviations of all measures at pretreatment, midpoint, and post-treatment are presented in Table 3. A series of t-tests were performed to examine whether the treatment and control groups were different on any of the measures at pretreatment. No significant differences on any of the measures between the two conditions were found.

A series of t-tests were also performed to test whether initial symptom levels were different between the student and community samples. Means and standard deviations for each sample are presented in Table 5.

A series of t-tests were performed to test whether initial symptom levels were different between the medicated (n = 5) and non-medicated (n = 22) samples. No significant differences were found.

The correlation matrix for the dependent measures of the 27 completers at pre-treatment is presented in Table 6. Considerable shared variance among the dependent measures was noted.

Between group analyses

Treatment effects

While pre-treatment group differences were not significantly different, non-significant differences existed. Thus, MANCOVAs followed by a series of ANCOVAs were performed on the outcome

measures, controlling for pre-treatment differences. MANCOVA analyses were performed separately for the symptom scales and coping measures. The MANCOVA analysis on a set of the symptom scales revealed a significant group difference at post-treatment, (Wilks' Lambda = .28, estimated $F(8, 10) = 3.16$ $p < .05$). The MANCOVA analysis on a set of the coping measures also revealed a significant group difference at post-treatment (Wilks' Lambda = .36, estimated $F(6, 14) = 4.17$, $p < .05$). Given that group differences on each symptom and coping-related dimensions were hypothesized, ANCOVAs for all measures were performed. Results are presented in Table 7. The ANCOVAs revealed significant group differences on the STAIS, BDI-II, IESRA, SRQFIN and SRQFAV, ACTSGS, and SES at post-treatment.

Intent to Treat Analyses

An intent to treat approach was taken for the outcome variables in order to determine if the relationships would hold with a more conservative set of data analyses. In these analyses, data of 5 dropouts in the treatment group and 1 dropout in the control group were added. These individuals were assumed to evidence no change at post-treatment. Means and standard deviations for this sample are presented in Table 4. MANCOVA analyses were performed separately for the symptom scales and coping measures. The MANCOVA analysis on a set of the symptom scales revealed no significant group difference at post-treatment, (Wilks' Lambda = .53, estimated $F(8, 16) = 1.76$ $p = .16$). The MANCOVA analysis on a set of the coping measures revealed no significant group difference at post-treatment, (Wilks' Lambda = .69, estimated $F(6, 20) = 1.49$ $p = .23$). ANCOVA analyses were also performed because of the aforementioned reasons. Results are presented in Table 7. Among the symptom scales, only the SRQFAV had a significant group difference at post-treatment. Among the coping scales, only the ACTSGS had a significant group difference at post-treatment.

Effect Sizes

Cohen's *d* statistics were calculated to compare the self-help condition to the control condition at post-treatment. ESs were calculated by subtracting the post-treatment mean of the control group (X_c) from the experimental group (X_t) and then dividing by the control group's standard deviation (SD_c) using the following formula: $ES = (X_t - X_c) / SD_c$. Evaluation of ESs was determined based on Wolf's (1986) criteria of $ES = .12$ to $.49$ as a small effect, $ES = .50$ to $.79$ as a medium effect, and an $ES \geq .80$ as a large effect. Results are presented in Table 8. The ACTSRI, ACTSSS, and SSQA had a small effect, all three IESR subscales, SRQFIN, SRQFAR, and ACTSWT had a medium effect, and the STAI-S, BDI-II, the SRQAV, ACTSGS, and the SES had a large effect.

Clinical Significance of Change

Clinically significant improvement defined by criteria established by Jacobson and Truax (1991) was examined. This standard was based on whether the individual's post-treatment score on each scale was at least two standard deviations below/above the mean of the completer sample ($n = 27$) at pre-treatment. Due to the large SD values for the IESRH and all SRQF subscales, their cutoff scores became negative based on the above definition of clinically significant improvement. Therefore, the above criterion was used only for the remaining set of measures. It was also anticipated that improvement levels would be relatively small in the current self-help study compared to treatment provided via individual or group therapy. Thus, clinically significant improvement was also defined as a change of 1.5 standard deviations below/above the mean of all completers at pre-treatment. Comparisons between the treatment and control groups were made using the critical ratio (CR), which determines the significance of the difference between two percents (Garrett, 1958).

Results are presented in Table 9. At the 2 SD level, the percentage of individuals in the

treatment group with clinically significant improvement, when compared to individuals in the control group, was higher on the STAIS, IESRI, ACTSGS, and SES. At the 1.5 SD level, the percentage of individuals in the treatment group with clinically significant improvement, when compared to individuals in the control group, was higher on the STAIS, BDI-II, IESRA, ACTSGS, ACTSWT, SSQA, and SES.

Sample Effects

Whether treatment effects were influenced by type of sample was examined by multivariate analyses of covariance (MANCOVA) followed by ANCOVAs, using a 2 (Group) x 2 (Sample) design, controlling for initial scores. Analyses were conducted separately for the symptom and coping related measures. The MANCOVAs revealed no significant interaction effect of Group x Sample on a set of the symptom measures (Wilks' lambda = .70; $F(8, 8) = .43, p = .87$) nor on a set of the coping measures (Wilks' lambda = .52; $F(6, 12) = 1.88, p = .17$). The ANCOVAs revealed no significant interaction effects on any of the symptom measures or the coping-related measures.

Effects of coping, social support, and self-efficacy levels on outcome

Whether increases in coping, perceived social support levels, and coping self-efficacy effected post-treatment levels of symptoms was tested. First, correlations between change scores on the coping strategy variables and change scores on coping self-efficacy were obtained. No significant relationships were found. Next, partial correlations between changes on coping, coping self-efficacy and social support, and post-treatment symptoms, controlling for initial symptom levels were obtained. Results are presented in Table 10. Positive changes on the SES were consistently associated with decreased scores on all symptom measures. Positive changes on the SSQA were also associated with decreased STAIS, BDI-II, IESRI, SRQFIN, and SRQFAR scale scores. Decreased scores of the ACTSWS

were correlated with decreased scores on the STAIS, IESRA, IESRI, IESRH, SRQFAV, and SRQFAR scales. Positive changes on ACTSGS and ACTSSS were correlated with decreased SRQFAV scores.

Within group analyses

Mastery test

Of 13 individuals in the treatment group, 10 completed all three mastery tests and 3 completed the relaxation and cognitive mastery tests within the 8 week period allotted for treatment. Each of the three Mastery tests was divided into information, practice and competency, and confidence based on an examination of the content of the Mastery test questions. One participant failed her first attempt at the relaxation mastery test and passed it at her second trial. Means and standard deviations of the three subscales of each mastery test are as follows: Relaxation Knowledge (RELAXK; \underline{M} = 14.4, \underline{SD} = 1.19); Relaxation Practice/Competency (RELAXP; \underline{M} = 5.3, \underline{SD} = 1.80); Relaxation Confidence (RELAXC; \underline{M} = 9.1, \underline{SD} = 1.26); Cognitive Knowledge (COGK; \underline{M} = 16.4, \underline{SD} = 1.19); Cognitive Practice/Competency (COGP; \underline{M} = 8.5, \underline{SD} = .88); Cognitive Confidence (COGC; \underline{M} = 8.3, \underline{SD} = 1.93); Exposure Knowledge (EXPK; \underline{M} = 14.1, \underline{SD} = 1.10); Exposure Practice/Competency (EXPP; \underline{M} = 7.1, \underline{SD} = .74); and Exposure Confidence (EXPC; \underline{M} = 12.5, \underline{SD} = 4.09). Based on self-report, participants in the treatment group practiced relaxation techniques 1.9 times per day (\underline{SD} = .76) , identified 9.4 irrational situations (\underline{SD} = 7.3) and challenged 9 irrational thoughts (\underline{SD} = 7.1) per week. Participants who completed the exposure mastery test reported that they conducted writing exposure an average of 4.2 times (\underline{SD} = 3.2) and in vivo exposure 4.5 times (\underline{SD} = 3.9).

Correlations among mastery test scores were obtained. Significant correlations were found between the cognitive practice/competency and exposure practice/competency subscale scores (r =

.72, $p < .01$) and between the cognitive confidence and exposure confidence subscale scores ($r = .98$, $p < .01$).

Partial correlations were obtained to examine what aspects of mastery were associated with post-treatment symptom scores. Pretreatment symptom scores were partialled out. The partial correlations revealed that lower intensity of avoidance symptoms (IESRA) was associated with higher cognitive confidence (COGC; $r = -.69$, $p < .05$) and exposure confidence scores (EXPC; $r = -.70$, $p < .05$). The analyses also revealed that lower frequency of avoidance behavior (SRQFAV) was related to higher cognitive confidence (COGC; $r = -.92$, $p < .01$), cognitive practice/competency scores (COGP; $r = -.59$, $p < .05$), exposure confidence (EXPC; $r = -.86$, $p < .01$), and exposure practice/competency (EXPP; $r = -.74$, $p < .05$). No other relationships were found.

Qualitative information

Emails from participants

None of the participants reported exacerbated symptoms during the period of participation. No therapeutic questions were emailed from the current participants. Five participants, 2 in the treatment group and 3 in the control group, emailed once that their passwords did not work. The investigator asked the webmaster to retrieve their ID and password from the host computer and then let them know the correct ID and password. None of them asked for their ID or password again. Twelve participants, 7 in the treatment group and 5 in the control group emailed at least one time to ask a technical question or to report trouble. These questions addressed: 1) confusion with the next step to take; 2) trouble finding a link to a certain page or the link not working; 3) trouble submitting assessment data; or 4) login trouble (not due to password or ID). After trouble-shooting, the investigator emailed detailed instructions of how to solve these problems. These problems were attributable to: 1) neglect of

the instructions or requirements; 2) incorrect operation of the program due to unfamiliarity with the Internet or computer; 3) program bugs; or 4) unknown. The program bugs were immediately corrected and participants received an apology by email. Speculations about the reasons for these program bugs include general network errors and incompatibility or lack of the capacity of the computer for providing the full function of the program. Five participants, 4 in the treatment group and 1 in the control group, emailed that they experienced delays of scheduled activities due to vacation or moving, or telephone number change. In each case, the investigator replied to participants within a half day.

Time requirement for the researcher

Time the investigator spent on the project involved : 1) following each participant's progress by checking the database; 2) emailing and phoning the participant; 3) trouble shooting; and 4) conducting the retrospective interview. The investigator accessed the database daily, spending about an hour to go through 5 assessment and 3 mastery test datasheets. Emailing or phoning a participant took about 5 minutes /contact. Trouble shooting time varied depending on the type of trouble and on the participant's skill level, ranging from approximately 10 minutes to 3 days per case. The retrospective interview required approximately 15 minutes per person.

How participants used the program

Participants in the treatment group who agreed to receive a retrospective interview ($n = 12$) were briefly asked about how they utilized the program. All of them reported that they printed out pages to read rather than going online to conduct treatment.

Discussion

Treatment effects

The hypothesis that trauma victims in the treatment group would experience a greater reduction

in symptoms compared to individuals in the control group was tested using analyses of covariance to post-treatment symptom levels controlling for pre-treatment differences. The analyses partially supported the hypotheses. In addition to a significant MANCOVA on a set of symptom measures, individual ANCOVAs, controlling for initial symptom levels, yielded several significant treatment effects. These included lower levels of state anxiety (STAI-S), depression (BDI-II), intensity of avoidance behavior (IESRA), frequency of avoidance behavior (SRQFAV), and frequency of intrusive thoughts (SRQFIN) for individuals in the treatment as compared to the control group. The ANCOVA analyses did not detect differences between the treatment and control groups on all of the symptom outcome measures, even though individuals in the SHICT group had lower scores than individuals in the control group on all symptom scales at post-treatment. The failure to show statistically significant differences on the several measures where no differences were found may be due to a lack of power.

Another reason for not finding differences between the two groups may be due to the fact that the current sample was sub-clinical. In fact, data from recent PTSD outcome studies, in which individuals with a diagnosis of PTSD were treated, reported more severe symptoms at pretreatment. For example, average scores for the STAIS across 11 studies (Bryant et al, 1998; Chemtob et al., 1997; Cooper & Clum, 1989; Feeny, Zoellner, & Foa, 2002; Foa et al., 1999; Foa, Hearst-Ikeda, & Perry, 1995; Foa et al., 1995; Foa et al., 1991; Hickling & Blanchard, 1997; Keane et al., 1989; Scheck et al., 1998) is 52.4 (SD = 9.67), whereas the mean score of the STAIS in the current study is 31.1 (SD = 11.36). The IES-Revised was used in only one study (n = 20) (Paunovic & Ost, 2000) treating individuals with PTSD. This study reported a mean avoidance score of 20.2 (SD = 6.4), intrusion score of 24.4 (SD = 5.8), and hyperarousal score of 18.1 (SD = 3.1), whereas participants in the current study had a mean avoidance score of 16.6 (SD = 7.5), intrusion score of 15.9 (SD = 6.2),

and hyperarousal score of 11.9 ($SD = 6.2$). As the above differences indicate, in addition to diagnostic differences, the current participants were generally less severe than in treatment outcome studies for PTSD that use therapist-administered treatments.

As evidenced by the effect sizes, differences on the symptom scales between the SHICT and control group at post-treatment were medium to large. Specifically, the SHICT had large effects when state anxiety (STAI-S), depression (BDI-II), and frequency of avoidance behavior (SRQPAV), were used as the outcome measures, while medium effect sizes were found on the remaining symptom scales. Recent meta-analytic studies reported an overall effect size of .87 for self-help interventions, 1.11 for fear reduction (Gould & Clum, 1993), and .91 for anxiety disorders (Marrs, 1995). Sharman (1998) reported the average effect size for 10 studies that used therapist-assisted exposure in the treatment of PTSD was .56. In the current study, the average effect size for the symptom scales was .77, ranging from .55 to 1.01. This effect size is comparable to the effect size for self-help interventions reported by Gould and Clum and better than the average effect size for the 10 exposure therapy studies for PTSD. However, it should be recognized that none of the individuals in the present study met criteria for PTSD and thus were a less severe sample than those examined by Sharman in his meta-analysis. Overall, the above results generally suggest the effectiveness of SHICT for reducing some trauma-related symptoms.

The hypothesis that trauma victims in the treatment group would increase coping skills, perceived social support, and coping self-efficacy compared to individuals in the control group was partially supported. The MANCOVA evaluating the overall effects of treatment on coping was significant. The ANCOVAs revealed that the SHICT produced significant differences between the treatment and control groups on general coping skills (ACTSGS) and coping self-efficacy (SES) at post-treatment. The effectiveness of the SHICT for improvement on general coping skills remained

significant even when the intent-to-treat approach was used. Overall, it can be concluded that the SHICT was superior to the wait-list control to increase general coping strategies (ACTSGS) and coping self-efficacy (SES).

The SHICT group demonstrated more improved scores than the control group on the coping-related measures at post-treatment. Particularly, the effect size of the general coping measure was large (2.00), indicating that individuals in the SHICT group increased their use of coping skills considerably more than did individuals in the control group. Given that the general coping measure included cognitive and relaxation skills that were directly taught in the SHICT program, it is reasonable to conclude that coping skills can be effectively taught to trauma victims via the Internet.

The SHICT did not appear to significantly change individuals' level of wishful thinking, information seeking, social support seeking, or perceived social support levels. Given that the SHICT did not provide modules for producing change on these coping strategies nor modules to increase social support, the data support the contention that change on coping was commensurate with the skills taught. The data further support the conclusion that the treatment group successfully learned treatment strategies provided in the SHICT.

The hypothesis that trauma victims in the SHICT group would demonstrate clinically significant improvement relative to individuals in the control group was partially supported. Although the number of dimensions on which differences between the two groups was demonstrated increased when the criterion for clinical significance was lowered, the percent of individuals achieving this level of reduction in the trauma-related symptom scores was low. For example, 15 to 69% of participants in the current study improved on PTSD symptoms when the lowered criterion was applied, while one PTSD treatment outcome study (Foa et al., 1991) that examined clinical significance of treatment effects based

on Jacobson and Truax's original criteria (1991) reported that 40 to 70 % of participants who were treated by cognitive behavioral techniques (i.e., exposure or stress inoculation therapy) improved on PTSD symptoms. Perhaps, because the current participants generally scored low on the measures compared to clinical samples with a PTSD diagnosis, it was hard to attain symptom reductions of 1.5 to 2.0 SD from the initial scores. The relatively large standard deviations also made it difficult to demonstrate clinically significant improvement. Nonetheless, the SHICT was successful in producing meaningful increases in the frequency of using coping skills, compared to the wait-list control, that made no clinically significant improvement in the measure. This finding supports the effectiveness of internet-based treatments in teaching coping skills.

Coping skills, mastery and symptom improvement

As was mentioned, the MANCOVA and ANCOVAs suggest that the SHICT group was superior to the wait-list control group in improving some trauma-related symptoms, including intensity of avoidance behavior (IESRA), frequency of avoidance behavior (SRQFAV), frequency of intrusive thoughts (SRQFIN), levels of state anxiety, and depression. Partial correlation analyses were conducted to determine what factors of the SHICT program were effective in producing change. First, whether increased use of positive coping strategies, increased perceived social support, or increased coping self-efficacy explained lower symptom scores at post-treatment were tested. Increased coping self-efficacy was related to symptom reduction on all measures. This is consistent with self-efficacy theory as well as recent empirical findings (Benight et al., 1997; Benight et al., 1999). Clearly, confidence in one's ability to utilize coping strategies under conditions of increasing levels of distress is important for changing trauma symptoms. Perhaps, people who experienced successful symptom reduction by using coping strategies increased confidence in their ability to apply such coping strategies,

further increasing coping self-efficacy.

Positive changes in perceived social support (SSQA) correlated with reductions of symptoms on 5 out of 8 scales at post-treatment. A decrease in the frequency of wishful thinking coping strategies was associated with decreased symptoms on 6 of 8 measures at post-treatment. The above results are consistent with research studies that reported positive relationships between decreased PTSD symptoms and higher social support levels (Jacobson et al, 2002; Dougall et al., 2001) and lower wishful thinking coping (Dougall et al., 2001; Valentiner et al., 1996). Interestingly, scores on the SSQA and ACTSWT were not influenced by the treatment. Small, but non-significant variations in perceived social support may be related to the involvement of people in the study. This involvement could in turn have produced slight changes in perceived social support that positively influenced therapeutic gains. The existence of wishful thinking coping strategies, on the other hand, might act as a barrier to utilizing more effective but difficult coping strategies. This suggests that the next version of SHICT should include modules to teach social support skills and decrease wishful thinking coping to test whether improvement on these factors leads to further improvement in post-trauma symptoms.

Increased use of general coping strategies, those taught in the treatment modules, was significantly related only to decreased avoidance. Given that the SHICT produced increases in general coping, it was reasonable to expect that increased use of these coping strategies would be related to symptom improvement on all measures. One possible explanation for why relationships were not found on all measures is the fact that the ACTS measures frequency of use of coping strategies, and frequency itself may be unrelated to improvement. Rather, competence in using coping skills may be the critical variable. Thus, individuals who improved in their competence of using coping skills may not have had to use them as frequently by the end of the 8-week period. Another possibility is that the

ACTSGS includes various general coping strategies, such as cognitive restructuring, relaxation, and positive distraction (e.g., engaging in exercise) and thus may not sensitively reflect the gain of each type of coping skills that might have independently influenced symptom reduction.

Although Bandura stated (1986) that individuals who experience increased frequency of using coping skills to deal with trauma-related symptoms also experience an increase in their self-efficacy, this relationship was not found in the current study. One possible explanation for these findings may be related to the measure of coping itself. The coping measure focuses on the frequency with which various strategies are used as opposed to the skill level that is represented during their use. Likewise, the SES is concerned with confidence in the ability to use coping strategies as opposed to an objective measure of skill. Some people who use coping strategies more frequently may do so because they are not effectively reducing symptoms, while others, who experience success, may continue to use them to deal with the possibility of future relapse in symptoms.

Whether the mastery approach produced was an important element of the treatment package was also examined. Results indicated that confidence in using exposure techniques was associated with reduction in intensity of avoidance behaviors (IESRA). Both confidence and practice/competency levels in using cognitive techniques were related to a reduction in the frequency of avoidance behaviors (SRQFAV).

The effectiveness of a self-administered treatment for trauma sequelae, especially with regard to reducing avoidance behaviors, was one of the critical concerns prior to conducting the present study. It was assumed that individuals were likely to avoid remembering and exposing themselves to trauma-associated stimuli during self-help treatment where a therapist's assistance was not available. The SHICT was designed to reduce this risk by training trauma victims to use relaxation and cognitive

restructuring techniques prior to self-exposure to the traumatic events. As the analyses revealed, the SHICT was relatively effective in reducing avoidance behavior. Because the exposure component targeted avoidance behaviors, it was expected that the exposure mastery test scores would be strongly associated with decreased avoidance. The equally strong association between cognitive mastery and decreased avoidance suggests the importance of involvement in and success with the cognitive module early in the therapy sequence. Apparently, mastery of the cognitive skills was an important precursor of mastery of the exposure skills. It seems likely that individuals who gained confidence in their use of cognitive restructuring skills also felt confident in their ability to learn exposure techniques, which in turn produced decreases in avoidance behavior. Individuals who did not attempt the exposure mastery tests might have felt it difficult to complete the component or might not have been able to finish the exposure component within the 8 week period.

Mastery experiences in use of the relaxation techniques had no effect on any symptom reductions. One study (Marks et al., 1998) that compared relaxation to other treatment components such as exposure and cognitive restructuring, reported relaxation as the least effective treatment component for PTSD. The current results also suggest that mastering relaxation techniques is not as essential as learning other coping skills in order to reduce trauma-related consequences. Examination of the components of mastery revealed that one's confidence and practice/competency levels of using skills, but not knowledge about the skills, were related to reductions in avoidance. The lack of relationship between knowledge and treatment outcome differs from a research study on the use of a self-help approach with GAD that reported a positive association between these variables (Bowman et al., 1997). It is possible that the difference in the relationship between the two studies is reflective of a difference in target symptoms (GAD vs. trauma sequelae).

There was no relationship between the SES and the mastery confidence subscales. Perhaps, this is due to the fact that the SES measures confidence in the ability to use coping strategies in a specific stressful situation, whereas the mastery subscales examine one's confidence to use specific skills regardless of situations.

Limitations and future directions

There are several limitations in the current study. First, the sample size was small, resulting in low power. The small sample size also reduced the power to investigate process-outcome relationships. Second, the current study conducted many mediational analyses and thus interpretations based on these relationships need to be done with caution. Finally, as noted above, the current sample was a sub-clinical population with no participants being diagnosed with PTSD. Given this limitation, the current results may not be generalizable to clinical samples.

There are several features that would improve the quality of a future version of the SHICT. First, although the current SHICT provides a variety of monitoring and practice forms and examples, it does not have an online interactive function to examine how individuals utilize these forms. The future SHICT might include interactive monitoring and practice forms, a feature that would increase the client's involvement with the system. Second, the current SHICT does not provide examples for the entire range of traumatic events, thus limiting the identification of all trauma victims with the examples provided. In order to increase the identification of the widest range of trauma victims with the intervention, a wider range of traumatic episodes and examples need to be included in a future SHICT. Third, as the results suggest, social support variables appear to be important to include as part of an intervention. Therefore, the next version of SHICT should include a module to encourage participants to access social support. Finally, although long-term maintenance of therapeutic effects in self-help interventions has been

demonstrated (Smith, et al. 1997; White, 1998; Tyrer et al., 1993), the current program did not provide follow-up assessment. In the next study with the SHICT, follow-up assessment should be provided to examine whether long-term effects exist in an online self-help program for trauma sequelae.

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Appendix A

Measures

Demographic Information

Personal Code _____

(appears in your informed consent form)

Name

First

Last

Address

Street

City

State

Zip

Birth Date

MMDDYY

Phone

Daytime

Evening

Marital Status

1. Never Married

2. Married

3. Divorced/Separated

Race/Ethnic Origin

1. African American

2. Asian American

3. Caucasian/White

4. Hispanic/Latin

5. Native American

6. Pacific Islander

7. Other

Gender

1. Female

2. Male

Highest Education Completed

1. Middle School

2. High School

3. Some College

4. College

5. Some Graduate

6. Graduate

Occupation Status

1. Employed

2. Unemployed

3. Student

Receiving Treatment?

1. Yes

2. No

STRESSFUL EVENT HISTORY (SEH)

Instructions: In the space next to each stressful event, please indicate as precisely as you can the number of times that event has occurred *in your lifetime*. If you experienced the event, respond to the two questions following each item by circling Y (yes) or N (no).

Number of times occurred in my lifetime		Did you <i>think</i> that you might die or be seriously injured?	Did you suffer serious injury (required doctor's care)?
	1. Been robbed in person/mugged.	Y N	Y N
	2. Been in a combat situation.	Y N	Y N
	3. Watched someone get killed.	Y N	Y N
	4. Been in a life-threatening automobile accident.	Y N	Y N
	5. Had a serious illness, for example, cancer, meningitis, etc.	Y N	Y N
	6. Been sexually assaulted including penetration.	Y N	Y N
	7. Had a close friend or family member be killed (not suicide).	Y N	Y N
	8. Watched someone be seriously injured (required a doctor's care).	Y N	Y N
	9. Been seriously physically assaulted as a child	Y N	Y N
	10. Been sexually assaulted (not penetrated).	Y N	Y N
	11. Had my house seriously damaged by some natural event (hurricane, fire, flood, tornado, etc.)	Y N	Y N
	12. Been in a serious accident (other than automobile).	Y N	Y N
	13. Had a relative I lived with die by suicide.	Y N	Y N
	14. Been seriously physically assaulted as an adult.	Y N	Y N
	15. Been threatened with a weapon.	Y N	Y N
	16. Been in a hurricane, fire, flood, tornado, etc. where my life was in danger.	Y N	Y N
	17. Been a hostage or prisoner of war.	Y N	Y N
	18. Been tortured to the point that you feared for your life.	Y N	Y N
	19. Been responsible for serious injury of another person.	Y N	Y N

Please provide a brief description of the stressful event associated with your current symptoms that you want to work on through this program.

Active Coping with Trauma Scale (ACTS)

Instructions: People use a variety of coping strategies to help them deal with stressful events. Thinking of your *most stressful event*, please indicate how often you have used the coping strategies listed below. Using the following scale, please rate how frequently, for the time periods listed, you have practiced or used each strategy. Evaluate your use of all strategies for the first time period before going on to the next time period. When you have finished, you should have placed a number *in all three boxes* following each question.

- 0 = Never**
1 = Seldom
2 = Occasionally
3 = Frequently

	<u>Currently</u>
1. When I felt myself begin to get anxious, I tried to identify triggers in the environment for my anxiety.	
2. When I was bothered by my memories, I engaged in activities around the house.	
3. I didn't let it get to me emotionally.	
4. I reminded myself that the event was not my fault.	
5. I read about the feelings I was having after the event.	
6. I did deep belly breathing to help calm my nerves.	
7. I tried to forget the whole thing	
8. I talked to friends, family, or others about my feelings.	
9. I chose times to think about the details of the event.	
10. I pretended it never really happened.	
11. I listened to radio programs or viewed television programs about people who have gone through events like mine.	
12. I drank to help me forget	
13. I hoped the problem would just go away.	
14. I replaced thoughts of the event with a more pleasant picture in my mind.	
15. I informed friends, family, or others about the event.	
16. When I felt like I was reliving the event, I told myself that though it feels awful, it is not real.	
17. When reminded of the event, I focused my energy on my work.	
18. I pushed any reminders of it out of my mind	
19. When the event came into my mind, I let myself think about it.	
20. I talked to others who have experienced similar events to learn how they dealt with it.	
21. I kept my thoughts about it to myself	
22. I engaged in activities that helped me relax.	
23. I tried to look on the bright side of things	
24. I confided in others about the nature of my problem.	
25. I stopped thinking about it so I wouldn't get upset.	
26. When I felt anxious, I looked inside to see how my thoughts related to my anxiety.	
27. I told myself it didn't really happen.	
28. I replaced the bad feelings with good feelings	
29. I chose to enter situations that reminded me of the event.	
30. I found myself wishing for a miracle	
31. I punished myself for letting it happen	
32. I tried to learn about different ways to deal with my responses to the event.	
33. I practiced ways to relax while I was in situations that reminded me of the event.	
34. I asked others for support and encouragement.	
35. I allowed myself set time periods to think about the event.	

36. When upset by my thoughts, I took part in fun activities.	
37. I found myself repeating the same behavior that led to the event	
38. When I had feelings similar to those during the event, I let myself continue to feel them.	
39. I kept my feelings to myself	
40. I actively thought about the event to understand it better.	
41. I practiced ways to relax before entering situations that remind me of the event.	
42. I informed friends, family, or others about how I'm doing with the traumatic event.	
43. I used exercise to help myself forget.	
44. I blamed myself for letting it happen.	
45. I tried to remember the feelings I had during the event.	
46. I let myself fall asleep knowing I would probably dream of the event.	
47. I wished someone or something had intervened so the event never happened.	
48. If I found myself feeling bad, I'd just try to think about something pleasant.	
49. I used my imagination to help me relax when something reminded me of the event.	
50. When feeling like the event was happening again, I let people around me know what was happening.	
51. I wished I had the foresight to have avoided the whole thing.	
52. I'd do things to myself that I knew would only make things worse.	
53. When I was fearful, I asked myself what scared me and tried to determine how dangerous that thing really was.	
54. I convinced myself that it really wasn't so bad	
55. I read, watched television, or listened to music when bothered by thoughts of the event.	
56. I tried to remember parts of the event where I had blank spots.	
57. I injured myself to relieve the bad feelings and memories	
58. I didn't let anyone know my true feelings	
59. I actively thought about the event and practiced relaxation at the same time.	
60. I told people how to take care of me while I was reexperiencing the event	
61. I told myself it didn't really happen.	
62. I replaced bad thoughts about the event with good thoughts.	
63. When I felt guilty about the event, I thought about other reasons it happened that were out of my control.	
64. I ate to relieve the bad feelings and memories	
65. I tried to remember details of dreams I've had about the event.	
66. I had fantasies that turned the whole situation around	
67. I talked to people who may have information about my event.	
68. I put a lid on my feelings about it.	
69. I did something with other people to keep my mind off the event.	

Social Support Questionnaire-Part A

Directions: Please answer the following questions based on how generally supported you feel. Check the box that best indicates your response to each question.

	Never	Rarely	Some- times	Most of the time	All of the time
1. Are members of your family helpful when you need it?					
2. Do others care about your problems?					
3. Are your friends dependable?					
4. Do you talk to members of your family when you feeling emotionally upset?					
5. Are you comfortable in discussing your emotions?					
6. Do you appreciate help from others?					
7. Are your friends helpful when you need it?					
8. Do you talk things over with your family before making decisions?					
9. Do you take the initiative when you want to be with people?					
10. How often do people find you likable?					
11. Do others understand you?					
12. Can members of your family be counted on for emotional support?					
13. Do you feel similar to your peers?					
14. Do others take your problems seriously?					
15. Is your family dependable?					
16. Do you talk to others about things that are important to you?					
17. Are you comfortable in seeking help from others?					
18. Do you feel accepted by your peers?					
19. Do you feel comfortable talking about your problems?					
20. How often do you feel alone?					
21. Does your family accept you no matter what?					
22. Do you seek out others when you have a problem?					

Self-efficacy Scale (SES)

Please rate how sure you are that you can use your coping strategies to deal with each of the situations below.

0	10	20	30	40	50	60	70	80	90	100
Cannot do at all			Hardly can do				Probably can do			Certain can do

1. Listening to people talking about a traumatic event similar to my own event. _____
2. Listening to a radio program in which traumatic events like mine are discussed. _____
3. Viewing television programs/movies in which traumatic events like mine are shown. _____
4. Reading books about traumatic events like mine. _____
5. Remembering my traumatic event. _____
6. Experiencing a vivid picture of the traumatic event. _____
7. Having a nightmare of the traumatic event. _____
8. Going to places that are similar to the place where I experienced the traumatic event. _____
9. Entering the place where the traumatic event happened. _____

Appendix B

ATTENTION TRAUMA VICTIMS!!

We are offering a FREE Internet-based treatment for people experiencing the conditions below.

Open to all adults 18 years of age or older.

Treatment schedules are flexible, access the Internet for 8 weeks.

Have you experienced;

- Interpersonal violence, such as physical assaults, sexual assaults, rape, burglary, etc.
- Witnessing violent acts, severe accidents, suicide, etc.
- Man-made accidents, such as car accidents, farm accidents, factory accidents, explosion, etc.
- Natural disasters, including tornadoes, hurricanes, earthquakes, floods, avalanches.
- Occupation-related traumatic events, such as those encountered by fire fighters, police officers, medical professionals.
- Any event that involved actual or threatened death or serious injury to yourself or others.

AND

Are you currently experiencing;

- Repeated recollections of the event, including images, thoughts, or perceptions
- Repeated nightmares of the event
- Repeated flashbacks of the event
- Fear or anxiety when you encounter things that remind you of the event
- Increased heart rate, dizziness, sweating, or other physiological reactions to things that remind you of the event
- Avoiding thoughts or feelings associated with the event
- Avoiding things, places, activities, or people that remind you of the event
- Difficulty falling asleep
- Difficulty concentrating
- Excessive startle responses

For more information or to register, please email or call at

mhirai@vt.edu or (540) 231-3235.

Appendix C

Telephone Screening

TRAUMATIC EVENT & SYMPTOMS

1) What is the traumatic (stressful) event associated with your current symptoms that you want to work on through this program?

Y N

- a. Natural disasters (e.g., hurricane, tornado, earthquake, flood, etc.)
- b. Manmade accident (e.g., car, industrial, farm, etc.)
- c. Interpersonal violence (e.g., robbery, burglary, physical assault, sexual assault, rape, etc)
- d. Loss (e.g., death of a family member, friend, relatives, etc.)
- e. War or combat-related experience – **exclusion criterion**
- f. Childhood sexual abuse – **exclusion criterion**
- g. Other (_____)

2) Symptoms

Y N

- a. Repeated recollections of the event, including images, thoughts, or perceptions
- b. Repeated nightmares of the event
- c. Repeated flashbacks of the event
- d. Fear or anxiety when you encounter things that remind you of the event
- e. Increased heart rate, dizziness, sweating, or other physiological reactions to things that remind you of the event
- f. Avoiding thoughts or feelings associated with the event
- g. Avoiding things, places, activities, or people that remind you of the event
- h. Other (_____)

INTERNET & COMPUTER

Y N

- 2. Do you have access to the Internet through Internet Explorer?
- 3. Are you familiar with receiving and sending email with attachment?
- 4. Are you familiar with typing text, saving, printing out documents in your computer

EXCLUSION

Y N

- 5. Are you currently experiencing organic brain disorders, such as severe problems of memory, vision, hearing, or motor function that affect your daily life?
- 6. Are you currently having psychotic symptoms, believing that others are out to get you, thoughts are broadcasted, being abducted by aliens, hearing vivid voice or sounds that controls you, experiencing seeing things that do not exist?
- 7. Are you currently receiving treatment for your emotional problem(s)?
- 8. Do you have plans to make a suicidal attempt in the near future?
- 9. Are you currently mutilating yourself or do you plan to mutilate yourself in the near future?

*The individual should be excluded if he answered YES to any of 1-e, 1-f, 5, 6, 7, 8, or 9.

** Follow the Emergency procedures if she answered NO to 7 and YES to 8 or 9.

Date:	Name:	Email:
Address:		
		Phone:
Circle	Included	Personal Code # :
	Excluded	Reasons:

Appendix D

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY Informed Consent for Participants of Investigative Projects

Title of Project: An Internet-based Self-Change program for Trauma Sequelae
Investigator: Michiyo Hirai, M.S.
Advisor: George A. Clum, Ph.D.

I. Purpose of This Research

The purpose of this research is to examine the effectiveness of a newly-developed Internet-based self-help program for trauma victims. To this end, individuals who have experienced traumatic events during their lives and who are suffering symptoms that may be related to those traumas will be assessed on our Internet-based program and assigned to either an immediate intervention group or an 8-week wait-list group (delayed intervention group). The purpose of the two groups is to be able to compare individuals who receive the intervention immediately with individuals who wait to receive the intervention. The decision of who will be offered the intervention immediately and who will be placed in the wait-list group will be decided by a random assignment procedure. Those individuals who wait to receive the intervention will, after the 8-week waiting period, go through the same intervention process. No therapeutic interventions by therapists will be offered, but therapists will respond to e-mail asking technical questions (e.g., how to use the website, a forgotten username, password, or personal code, etc) and/or the participant's reporting their wish to drop out of the study

The online intervention consists of education about the effects of trauma, causes of continuing problems from trauma, skills for managing anxiety associated with trauma, and skills for overcoming problematic ways of dealing with and thinking about the traumatic event. In the present research we will examine whether the internet-based treatment will: 1) reduce trauma-related symptoms and emotional distress; 2) increase self-confidence in being able to deal with stressful situations; and 3) improve coping skills for dealing with trauma.

II. Eligibility

You are eligible for this study if you would like to work on your current symptoms associated with extremely stressful events, such as natural disasters, man-made accidents, physical assaults, sexual assaults, witnessing any of these events, and/or witnessing someone killed or seriously injured. You need to be familiar with using computers to type text, save, and print out documents. You also need to have access to the Internet and email, and need to be familiar with using them.

You are not eligible for this study 1) if the symptoms you would like to work on are the consequence of war trauma and/or severe childhood sexual abuse; 2) you are suffering from an organic brain disorder, including but not limited to, severe memory problems or problems controlling your movements; 3) you are suffering from psychotic symptoms, including but not limited to, hallucinations and delusions; 4) you have been diagnosed with a schizophrenia or other psychotic disorder; OR 5) currently you have immediate intention to mutilate myself or make a suicidal attempt.

II. Procedures

The present self-help intervention program for the consequences of trauma is an 8-week internet-based computerized interactive program, including education, anxiety management skills, cognitive restructuring, and exposure components, with e-mail contact. You will have 8 weeks to complete this intervention program, but will not have a specific time limit for completing each component. You can complete this program in less than 8 weeks if you are able to complete all assignments. You are allowed to repeat any of the treatment components if you wish to do so. How frequently you access the website depends on your motivation, severity levels, progress, and other factors. It is, however, estimated that you will need to access the program at least 3 times a week and spend one hour for each access in order to complete the treatment program.

If you are assigned to the treatment group you will receive the web-site address to start the program following the instructions on the site. The program consists of an initial assessment, the treatment components, and periodic assessments every four weeks. You will complete this program in 8 weeks and will be given a follow-up assessment 8 weeks after the end of the treatment period. If you are assigned to the delayed intervention group (an 8-week wait group), you will receive the web-site address to receive the initial and periodic assessments every four weeks. You will receive the same self-help treatment program as those in the treatment group in 8 weeks. This means that if you are in the delayed intervention group you have to wait for up to 8 weeks. During this period, if you think it is necessary to seek alternate therapy/help for your problem, you may. Telephone numbers in the Blacksburg community of agencies that provide free or inexpensive treatment for victims of trauma are provided below. If you live outside the Blacksburg community, you may let the researchers know of your need to seek alternate therapy. After you contact us with this request the researchers will immediately initiate a search to find someone in your geographical area with an expertise in anxiety disorders and provide you with that information. If you want to initiate this search on your own you may contact your local Mental Health Association as a referral source in the United States to obtain a list of respected mental health professionals (please see the Risk section for more information). If you choose to do so however, you can continue to participate in this program.

You will use a personal code number, which appears in the last page of this form, to access the assessment and treatment areas. You will create your own username and password when you first visit the site.

III. Risks

There are several risks in this study. It is possible that completing the assessment instruments may cause some distress. It is also possible that completing the treatment modules may not reduce your symptoms. During the treatment period or the waiting period, you might feel it is necessary to seek alternate therapy/help for your problem. If any of these occurs and you are in the Blacksburg, Virginia area, you may wish to contact a psychologist at the Psychological Services Center (540-231-6914) and/or contact the primary researcher by email (mhirai@vt.edu). If you are a student, you may want to seek help at the Virginia Tech Counseling Center (540-231-6557). If you need our help, we would be happy to help you contact them. If you are outside of the Blacksburg, Virginia area and wish to contact a mental health professional, inform us of your wish by e-mail and we will initiate a search for an appropriate professional and contact you with his/her name and contact number.

If you express intent to harm or kill yourself during treatment, we will inform you that you need to seek adequate help at the Psychological Services Center (540-231-6914) or the Counseling Center (540-231-6557). For an emergency situation, we strongly encourage you to call RAFT (540-961-8400). The PSC charges you for treatment. Fees at the PSC are determined based on your income level. The maximum charge is \$10 regardless of whether you have insurance.

If you live outside the Blacksburg community, and you express an intent to harm or kill yourself during treatment we will immediately initiate a search to find someone in your geographical area with an expertise in anxiety disorders and provide you with that information. You are also informed of the availability of the National Mental Health Association (1-800-969-6642) as a referral source in the United States for respected mental health professionals, where you are able to search the nearest National Mental Health Association affiliate to find specific mental health service or support program in your community. For an emergency situation, we encourage you to call the National Hopeline Network (1-800-SUICIDE or 1-800-784-2433) to reach a certified crisis center 24 hours a day, seven days a week.

IV. Benefits

The benefits of this study are that you may 1) increase your understanding of your trauma related problems; and 2) learn empirically validated treatment skills to reduce trauma-related symptoms and emotional distress.

V. Compensation

If you are student at Virginia Tech, you will receive three (3) extra credit points for your completion of three

assessments (one point each for pre-treatment, 5th week, and post-treatment), regardless of which group you are in.

In addition, if you are in the treatment group, you will receive one (1) extra credit point for your contract to complete the follow-up assessment, three (3) extra credit points for your regular access to each of the three treatment modules for 8 weeks, and three (3) extra credit points for your attempts on each of the three mastery tests. If you are in the control group you can receive two (2) extra credit points when you start treatment after the 8-week wait period.

Alternative opportunities to obtain extra credit other than participation in this study are available to you. Please contact Chris Dula at 231-6279 or e-mail him at cdula@vt.edu for further information.

VI. Extent of Confidentiality and Anonymity

All personal information given online in this study will be stored in an encrypted host computer and backup devices (i.e., floppy disks, zip disks) and will be kept confidential. The security of data in the host computer and confidentiality will be maintained by the webmaster (Jason Fortney, Information Specialist at the Department of Psychology). Username and password will be stored in a database in the host computer separate from a main database for individuals' personal data to protect any attempts to break into the main database. You will be assigned a personal access code number, which appears in the last page of this form. This personal code number will be used when you enter your assessment data. This code numbers will be used for all of the data analysis to help us ensure your confidentiality. All information stored in backup device (i.e., floppy disks, zip disks), the informed consent forms, and paper-and-pencil assessment instruments will be kept in locked files that only the researcher and the advisor will be able to access. No information will be shared orally or in writing with anyone but the researcher and the advisor. All information connecting you to this study will be destroyed after three years.

Results may be published or presented for scientific purposes, but your identity will not be revealed in any description on publication of this research.

If you were to express the intent to do harm either to yourself or to others, the researchers may break confidentiality and report this to the above facilities described in the Risk section.

VII. Freedom to Withdraw

You are free to withdraw from the study at any time for any reason without penalty.

VIII. Approval of Research

This research project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University, by the Department of Department of Psychology.

IRB Approval Date Approval Expiration Date:

IX. Subject Responsibilities

I voluntarily agree to participate in this project. I agree that I am responsible for answering questions on the assessment instruments given to me on the website, conducting treatment components provided to me on the website, and answering the telephone interviews given by the researcher

X. Subjects Permission

I have read and understand the Informed Consent and the conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for participation in this project.

Name
(Print) _____

Signed _____

Date _____

Personal Code: _____ (3 digits, necessary to access the assessment and treatment modules)

Should you have any questions regarding this research or its conduct, you may contact:

Investigator:	Michiyo Hirai, M.S.	Phone: (713) 500-2608 mhirai@vt.edu
Advisor:	George A. Clum, Ph.D.	Phone: (540) 231-5701 gclum@vt.edu
Chair, Human Subjects Committee:	David W. Harrison, Ph.D.	Phone: (540) 231-4422 dwh@vt.edu
Chair, IRB Office of Research Compliance Research & Graduate Studies Psychology Department Main Office:	David M. Moore, DVM.	Phone: (540) 231-4991 moored@vt.edu
		Phone: (540) 231-6581

Appendix E

Treatment Aid - Forms

Relaxation Practice Form

Tension Level
 1=Low
 2=Relatively Low
 3=Moderate
 4=Relatively High
 5=High

Name:

Date	Time	Type of Relaxation Technique	Tension Level Before Practice	Tension Level After Practice	Comment
			1 2 3 4 5	1 2 3 4 5	
			1 2 3 4 5	1 2 3 4 5	
			1 2 3 4 5	1 2 3 4 5	
			1 2 3 4 5	1 2 3 4 5	
			1 2 3 4 5	1 2 3 4 5	
			1 2 3 4 5	1 2 3 4 5	
			1 2 3 4 5	1 2 3 4 5	
			1 2 3 4 5	1 2 3 4 5	
			1 2 3 4 5	1 2 3 4 5	
			1 2 3 4 5	1 2 3 4 5	

Cognitive Restructuring Form (Date: _____)

1. Situation	2. Feelings/emotions		
3. Thoughts		4. Challenge	5. Alternative/rational thoughts and responses
		<u>Evidence for</u>	
		<u>Evidence against</u>	

Writing Exposure Form (Date _____)

Your traumatic event that you want to work on (e.g., car accident, rape, etc.)	
Date it happened to you (day, month, year, time, etc.)	
Place it happened to you	
<u>Write about the event in detail, including, but not limited to, the following information</u> What did you experience in the event? What were you thinking while and right after it happened? How were you feeling in the event? What does the event mean to you? How did the event affect yourself, your beliefs toward yourself, others, and/or the world? How are you feeling now about the event?	

In Vivo Exposure Form (Name: _____)

Each time you practice in vivo exposure, write date, situation, your distress levels before and after in vivo exposure in this form. Write comments, including your thoughts and emotions you experience in each exposure practice. Use the following scale to evaluate your distress levels

- 0= no discomfort
- 20=not really discomfort
- 40=mildly discomfort
- 60=moderately discomfort
- 80=severely discomfort
- 100=extremely discomfort

Date	Situation	Distress levels (0-100)		Comments
		Before Exposure	After Exposure	

In Vivo Exposure Hierarchy Form (Date: _____)

List situations you are afraid of from the least fearful to the most. You can list as many places as you want. Rate these situations based on the scale below. This hierarchy will be used for your in vivo exposure.

It is very important that you list objectively reasonably safe situations. Please carefully examine your safety in these situations. For example, it is not objectively safe if you walk in a dessert parking at night.

0= no discomfort

20=not really discomfort

40=mildly discomfort

60=moderately discomfort

80=severely discomfort

100=extremely discomfort

	<u>Situations</u>	Distress level before exposure(0 - 100)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Appendix F

Mastery test

Mastery Test for Relaxation Techniques

Please enter your 3-digit personal code number _____

The following questions examine how well you understand how to apply relaxation techniques to help you reduce anxiety. Put a check in the box if the statement is True or mostly true or False or mostly false.

	True	False
1. The purpose of training yourself to relax is to help you stop or control anxiety symptoms.		
2. Relaxation techniques should be practiced only when you become anxious.		
3. Many people are not even aware when their muscles are tense.		
4. For some people, muscle tension is normal, and relaxation abnormal.		
5. Imagery can involve sight, sound, smell, touch, and taste.		
6. Most people can include all five senses readily when using imagery to relax.		
7. The ability to imagine a scene that you find very relaxing improves with practice and with freedom from distraction.		
8. Your goal of the number of breaths you take per minute, while at rest, is fewer than 9 times per minute.		
9. If your chest rises first as you inhale, with your stomach rising afterward, you are breathing from your diaphragm.		
10. When you practice diaphragmatic breathing, you should breathe through your nose.		
11. There are 5 general muscle groups.		
12. During muscle relaxation practice you should tense each muscle and hold the tension for a count of 5.		
13. You should hold the relaxation for a count of 5 at most.		
14. It is impossible to let your whole body relax.		
15. In the beginning of diaphragmatic breathing practice, you should sit in a quiet room sitting quietly in a comfortable chair.		
16. Shortness of breath is called dyspnea.		
17. Shortness of breath results from insufficient oxygen in your blood.		
18. Three relaxation techniques were learned.		

Complete the questions below in reference to your practicing relaxation in the last week.

	Number
19. For the last 10 times practicing relaxation, how many time you scored 2 or below after practice?	
20. Based on your practice form for the last 7 days, how many days have you practiced any of the relaxation techniques? Write the number of days that you practiced.	
21. Based on your practice form for the last 7 days, how often have you practiced any of the relaxation techniques per day? Write the average number of your practice per day.	
22. Breathe diaphragmatically and count your breaths for one minute. How many times did you breathe?	

	Yes	No
23. I accessed the places I have identified to relax at least once a day to practice the relaxation techniques.		
24. I practiced the relaxation techniques at quiet places, such as in my room.		
25. I practiced the relaxation techniques in places, where some distractions, such as the presence of other family members or noise, exist.		
26. I practiced the relaxation techniques when I was in public places, such as standing in line		

at the supermarket, bank, riding a car, sitting at work, etc.		
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The questions below refer to the degree of confidence you have in knowing and using relaxation techniques. Put a check in the box that best represents your level of knowledge or confidence.

	Yes	No
27. I feel confident that I have learned the tensing and relaxing strategy.		
28. I am certain that I have practiced the imagery-induced relaxation technique enough to help me control my anxiety.		
29. I am sure that I have practiced diaphragmatic breathing enough to relax when I am in situations other than a quiet place at home.		
30. I am certain that I am now able to use at least one of the relaxation techniques to bring anxiety symptoms under control.		
31. I have experienced a significant increase in relaxation when engaging in relaxation strategies.		
32. I think I can teach others the tensing and relaxing strategy without seeing the instructions.		
33. I can teach others how to do diaphragmatic breathing without seeing the instructions.		
34. I can teach others how to use imagery to relax muscles without seeing the instructions.		
35. I am confident that I could apply at least one of the relaxation techniques I have learned while I was in situations that made me feel anxious.		
36. I am certain that I am ready to learn the next treatment component because I am confident in my relaxation skills.		

Mastery Test for Cognitive Restructuring

Please enter your 3-digit personal code number _____

The questions below refer to information that you may have learned with regard to how your thoughts affect your emotions and what to do about it. Put a check in the box indicating whether the statement is True or mostly true of False or mostly false.

	True	False
1. Individuals who experience traumatic events may develop extreme anxiety responses to less dangerous events or objectively non-dangerous situations.		
2. Anxious people tend to interpret relatively safe environments as extremely dangerous.		
3. Trauma victims are likely to miscalculate the level of danger in everyday life situations.		
4. Cognitive restructuring helps trauma victims modify their perceptions of non-dangerous situations as dangerous.		
5. Cognitive elements that provide us with core beliefs and that help us interpret ourselves, other's behaviors, and environmental events are called schemas.		
6. Anxiety may be produced by our thoughts.		
7. Cognitive processes are automatic and may affect anxious individuals' behaviors.		
8. Cognitive restructuring provides you with the opportunity to identify, evaluate, and modify your negative cognitive processes.		
9. There are 4 steps in cognitive restructuring		
10. The first step of cognitive restructuring is to identify in which you experience negative emotions.		
11. After you identify the negative automatic thoughts, you need to challenge your negative thoughts.		
12. The final step of cognitive restructuring is to identify a different way of thinking about that situation.		
13. Cognitive restructuring cannot modify trauma victims' feelings of guilt, anger, and/or shame.		
14. Negative emotions in trauma victims include only anxiety.		
15. Negative cognitive processes are usually conscious.		
16. The way you see a single negative event as a never-ending pattern of defeat by using words such as "always" or "never" when you think about it is called "overgeneralization."		
17. Cognitive restructuring tells you how to separate our thoughts and emotions such as anxiety.		
18. Catastrophizing is the way you exaggerate the importance of your errors or mistakes.		

The questions below refer to the frequency of practicing your cognitive restricting tasks and the success that you experienced during these exercises.

	Yes	No
19. In the last 7 days, I tried cognitive restructuring at least once a day.		
20. In the last 7 days, I was able to identify my negative thoughts.		
21. In the last 7 days, I was able to separate my negative emotions from thoughts.		
22. In the last 7 days, I was able to challenge my negative thoughts.		
23. In the last 7 days, I noticed my emotions changed after challenging my negative thoughts.		

	Number
24. Based on your Cognitive Restructuring Form that you completed in the last 7 days, how many situations, in which you experienced negative emotions, have you identified?	
25. Based on your Cognitive Restructuring Form that you completed in the last 7 days, how many counter-statements to distressing thoughts (evidence against your thoughts) have you identified to help you challenge your negative thoughts?	
26. Based on your Cognitive Restructuring Form that you completed in the last 7 days, how many negative thoughts have you challenged?	

The questions below refer to the degree of confidence you have in knowing and using the cognitive restructuring technique. Put a check in the box that best represents your level of knowledge or confidence.

	Yes	No
27. I am sure that I have learned how to use the Cognitive Restructuring Form (CRF).		
28. I am certain that I have practiced cognitive restructuring enough and I can use the CRF without reading the instructions.		
29. I feel confident that I have learned the steps of the cognitive restructuring strategy		
30. I am certain that I am now able to use cognitive restructuring to modify my negative thoughts.		
31. I have experienced a significant decrease of my negative emotions when engaging in cognitive restructuring.		
32. I think I can teach others how to use cognitive restructuring without seeing the instructions.		
33. I am confident that I can challenge my negative thoughts.		
34. Now, It is not difficult for me to identify situations in which I feel negative emotions.		
35. I am confident that I could apply the cognitive restructuring techniques whenever I feel I have negative emotions.		
36. I am certain that I can separate my automatic negative thoughts from emotions.		

Mastery Test for Exposure

Please enter your 3-digit personal code number _____

The following questions examine how well you understand how avoidance affects your recovery and how exposure works to help you recover. Put a check in the box if the statement is True or mostly true or False or mostly false.

	True	False
1. Confronting the traumatic experiences and getting used to the distressing memories and feelings is an important part of reducing your anxiety.		
2. Avoiding memories, thoughts, feelings, and situations that are associated with the traumatic events is one way to reduce your anxiety and emotional difficulties.		
3. It is quite normal that you try to avoid memories, thoughts, feelings, and situations that remind you of your traumatic event.		
4. In vivo exposure, you need to exposure yourself to the most difficult situations first.		
5. If you feel extremely anxious during in vivo exposure, you should stop it and restart it after your anxiety level declines.		
6. In vivo exposure, you first make a list of fear-provoking situations.		
7. In writing exposure, you write about what you saw, what you heard, what you smell, what you tasted, and how your body felt during the traumatic event.		
8. In writing exposure, you need to describe what the event means to you, how the event affected yourself, your beliefs toward yourself, others, and/or the world.		
9. In your writing exposure, you should not describe your feelings and emotions.		
10. As part of writing exposure, you are required to read your writing repeatedly and let yourself feel your emotions.		
11. You have to repeat in vivo exposure until you rate the fear-provoking situation as 20 or below based on a scale of 0-100.		
12. In writing exposure, you may notice your irrational thoughts. However, you have to concentrate only on writing and reading, and thus you shouldn't work on your irrational thoughts until you complete your writing exposure exercise for 2 weeks.		
13. The list of fear-provoking situation is called a hierarchy.		
14. After exposure exercise but not during, you may apply your learned relaxation techniques.		
15. The ultimate goal of in vivo exposure is to stop avoiding the fearful situation you are avoiding now.		
16. In vivo exposure, you expose yourself to anxiety-provoking but objectively relatively safe situations.		

In the blocks below indicate how many times you completed each of the identifies tasks.

	Number
17. How many times in the past did write about the event?	
18. On average, how many times in the last week did you read each of your writing exposure?	
19. For your excised in in-vivo exposure, how many times in the last week did you exposure yourself to previously avoided situation?	

20. One more time. Write about the traumatic event you have worked on.

The questions below refer to the degree of confidence you have in knowing and using relaxation techniques. Put a check in the box that best represents your level of knowledge or confidence.

	Yes	No
21. I am sure that I have learned how to use the Writing Exposure Form (WEF).		
22. I feel confident that I have learned the steps of the writing exposure strategy		
23. I am certain that I have practiced writing exposure enough not to avoid my memories and feelings of my trauma.		
24. I am certain that I am now able to use writing exposure to reduce my anxiety.		
25. Compared to when I first began writing about the traumatic event I now experience fewer negative emotions when writing about it.		
26. Compared to when I first began to read what I had written about my traumatic event I now experience fewer negative emotions when I read what I have written about it.		
27. I have experienced a significant decrease in anxiety and other negative emotions after conducting my writing exposure exercises		
28. I can teach others how to use writing exposure without seeing the instructions.		
29. Compared to when I first tried to expose myself to my trauma through writing I now experience fewer negative emotions and less avoidance.		
30. I am confident that I can apply both writing and in vivo exposure whenever I feel anxiety and negative emotions about traumas in the future.		
31. I am sure that I have learned how to use the Hierarchy Form (HF).		
32. I am sure that I have learned how to use the In Vivo Exposure Form (IVEF).		
33. I am certain that I have practiced in vivo exposure enough and I can use the HF and IVEF without reading the instructions.		
34. I feel confident that I have learned the steps of the in vivo exposure strategy		
35. Currently, when conducting in vivo exposure, I experience emotions as if I were in the event again.		
36. I am certain that I am now able to use in vivo exposure to reduce my anxiety and avoidance behaviors.		
37. I have experienced a significant decrease of my negative emotions and anxiety after conducting in vivo exposure.		
38. If I experience a traumatic event in the future, I am confident that I can use writing and reading exposure to gain control over my negative emotions.		
39. Now, it is not difficult for me to conduct in vivo exposure in which I might feel anxiety.		
40. I believe I can teach others how to conduct in vivo exposure without seeing the instructions.		

Tables

Table 1. Demographic characteristics of the sample and type of target traumatic event

Variable		Treatment (n=13)	Control (n=14)
Age		27.9 (SD=11.7)	30.1 (SD=11.6)
Sex	Male	3	3
	Female	10	11
Race	African American	1	1
	Asian	0	2
	Caucasian	11	10
	Other	1	1
Marital status	Single	8	9
	Married	3	5
	Divorced	1	0
	Other	1	0
Education	High school	1	0
	Some college	9	8
	College	2	3
	Some graduate	0	0
	Graduate	1	3
Occupation	Unemployed	3	1
	Employed	3	4
	Student	7	8
	Other	0	1
Medication	No	11	11
	Yes	2	3
Population	Community	6	9
	Student	7	5
Target event	Man-made accident	4	5
	Interpersonal violence	3	3
	Witnessing	2	1
	Disease, injury	2	1
	Loss of other (suicide, killed)	2	4
	Occupational trauma	0	0

Table 2. Summary of traumatic events reported in the SEH

Event	Once	More than once	Total
1. Robbed in person	1	0	1 (3.1%)
2. Combat situation	0	3	3 (9.4%)
3. Watched someone killed	3	0	3 (9.4%)
4. Automobile accident	10	3	13 (40.6%)
5. Serious illness, meningitis, cancer, etc	4	1	5 (15.6%)
6. Sexual assault, rape	5	4	9 (28.1%)
7. A close friend or family member be killed	5	5	10 (31.3%)
8. Watched someone be seriously injured	3	6	9 (28.1%)
9. Physically assaulted as a child	1	1	2 (6.3%)
10. Sexually assaulted (not penetrated)	4	7	11 (34.4%)
11. Had my house seriously damaged by natural event	6	1	7 (21.9%)
12. A serious accident (other than automobile)	6	1	7 (21.9%)
13. A relative die by suicide	1	0	1 (3.1%)
14. Seriously physically assaulted as an adult	3	4	7 (21.9%)
15. Threatened with a weapon	6	3	9 (28.1%)
16. Been in a natural disaster	1	2	3 (9.4%)
17. A hostage or prisoner of war	0	0	0
18. Tortured	0	0	0
19. Responsible for serious injury of another person.	1	0	1 (3.1%)

Table 3. Mean scores and SDs of completers on dependent measures at various assessment points

Measure		Pre			Mid			6-7wks			8 wks		
		<u>n</u>	<u>M</u>	<u>SD</u>									
STAIS	SH	13	28.77	9.88	-	--	--	4	21.5	16.09	13	18.15	12.25
	WL	14	33.29	12.54	-	--	--	-	--	--	14	28.71	10.66
BDI-II	SH	13	18.92	8.87	-	--	--	4	3.75	2.63	13	7.54	6.42
	WL	14	22.43	8.85	-	--	--	-	--	--	14	17.36	9.80
IESRA	SH	13	16.07	5.88	-	--	--	4	2.75	3.59	13	5.15	5.21
	WL	14	17.21	8.97	-	--	--	-	--	--	14	11.57	9.94
IESRI	SH	13	15.69	6.14	-	--	--	4	3.00	4.24	13	6.23	5.61
	WL	14	16.07	6.50	-	--	--	-	--	--	14	9.86	6.10
IESRH	SH	13	10.00	4.64	-	--	--	4	1.75	2.36	13	5.23	4.90
	WL	14	13.57	7.08	-	--	--	-	--	--	14	9.64	7.13
SRQFIN	SH	13	7.15	3.36	9	5.56	3.40	4	2.25	2.06	13	4.08	2.99
	WL	14	7.43	4.35	6	3.88	.75	-	--	--	14	6.21	2.94
SRQFAV	SH	13	8.23	4.88	9	4.11	2.52	4	2.00	2.16	13	2.00	1.83
	WL	14	9.21	5.74	6	4	2.45	-	--	--	14	6.79	4.73
SRQFAR	SH	13	17.08	6.84	9	13.67	7.19	4	10.00	8.60	13	9.92	8.32
	WL	14	19.29	12.96	6	12.00	2.28	-	--	--	14	15.29	9.73

(Table continues)

Table 3. Mean scores and standard deviations of completers by assessment points

(table continued)

Measure		Pre			Mid			6-7wks			8 wks		
		<u>n</u>	<u>M</u>	<u>SD</u>									
ACTSGS	SH	13	39.46	9.90	9	51.89	9.41	4	55.00	9.13	13	53.46	8.30
	WL	14	36.00	9.42	6	37.67	9.46	-	--	--	14	35.36	9.05
ACTSWT	SH	13	32.69	3.86	9	26.67	4.95	4	24.25	6.90	13	25.62	5.36
	WL	14	36.86	7.57	6	31.50	6.77	-	--	--	14	31.21	8.09
ACTSRI	SH	13	27.46	6.28	9	33.00	5.57	4	35.00	10.98	13	33.15	7.81
	WL	14	28.00	8.19	6	29.17	10.46	-	--	--	14	29.14	8.14
ACTSSS	SH	13	20.77	7.33	9	24.22	9.05	4	27.25	5.91	13	23.46	8.22
	WL	14	20.64	5.89	6	22.33	6.02	-	--	--	14	21.00	5.07
SSQA	SH	13	54.00	12.19	9	59.11	11.57	4	61.25	6.29	13	57.77	14.48
	WL	14	55.00	12.55	6	53.17	11.58	-	--	--	14	55.21	14.21
SES	SH	13	478.48	166.75	9	738.33	132.00	4	842.50	82.51	13	720.38	151.36
	WL	14	486.43	140.79	6	564.17	185.43	-	--	--	14	577.14	163.95

Note. STAIS: STAI State subscale; BDI-II: Beck Depression Inventory-II; IESRA: IESR Avoidance subscale; IESRI: IESR Intrusion subscale; IESRH: IESR Hyperarousal subscale; SRQFIN: SRQ Frequency Intrusion subscale; SRQFAV: SRQ Frequency Avoidance subscale; SRQFAR: SRQ Frequency Arousal subscale; ACTSGS: ACTS General Strategy subscale; ACTSWT: ACTS Wishful Thinking subscale; ACTSRI: ACTS Active Recall Information Seeking subscale; ACTSSS: ACTS Social Support Seeing subscale; SSQA: Social Support Questionnaire-A; SES: Self-Efficacy Scale.

Table 4. Means and SDs for intent-to-treat samples at pre-treatment and post-treatment

Measure		Pre			8 wks		
		<u>n</u>	<u>M</u>	<u>SD</u>	<u>n</u>	<u>M</u>	<u>SD</u>
STAIS	SH	18	28.78	10.43	18	21.11	13.03
	WL	15	32.53	12.43	15	28.27	10.42
BDI-II	SH	18	19.50	9.33	18	11.28	9.91
	WL	15	21.33	9.52	15	16.60	9.89
IESRA	SH	18	13.89	7.09	18	20.28	18.66
	WL	15	16.53	9.04	15	30.13	20.57
IESRI	SH	18	14.11	7.03	18	6.00	5.81
	WL	15	15.40	6.78	15	11.27	9.65
IESRH	SH	18	10.44	6.95	18	7.28	6.42
	WL	15	12.93	7.26	15	9.60	5.96
SRQFIN	SH	18	7.22	3.19	18	7.00	7.62
	WL	15	7.27	4.23	15	9.27	7.03
SRQFAV	SH	18	8.00	4.86	18	5.00	3.29
	WL	15	9.20	5.53	15	6.13	2.85
SRQFAR	SH	18	17.83	7.05	18	3.50	3.90
	WL	15	18.20	13.18	15	6.93	4.59
ACTSGS	SH	18	39.89	8.68	18	50.00	9.35
	WL	15	36.80	9.59	15	36.20	9.31
ACTSWT	SH	18	33.28	5.30	18	28.17	7.41
	WL	15	36.53	7.41	15	31.27	7.80
ACTSRI	SH	18	28.67	6.13	18	32.78	7.01
	WL	15	28.53	8.16	15	29.60	8.04
ACTSSS	SH	18	21.00	6.21	18	22.94	7.00
	WL	15	20.80	5.71	15	21.13	4.91

(Table continues)

Table 4. Means and SDs for intent-to-treat samples at pretreatment

(table continued)

Measure		Pre			8 wks		
		<u>n</u>	<u>M</u>	<u>SD</u>	<u>n</u>	<u>M</u>	<u>SD</u>
SSQA	SH	18	53.83	14.46	18	56.56	16.01
	WL	15	55.40	12.19	15	55.60	13.77
SES	SH	18	482.78	147.70	18	657.50	170.87
	WL	15	490.00	136.37	15	574.67	158.28

Table 5. Mean scores and SDs for community and student samples at pre-treatment

Measure	Community ($n = 15$)		Student ($n = 12$)	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
STAI-S	34.60	9.09	26.75	12.74
BDI-II	23.00	9.24	17.92	7.84
IESRA	18.07	9.28	14.92	4.25
IESRI	16.87	5.08	14.67	7.44
IESRH	13.27	6.11	10.08	6.07
SRQFIN	8.20	3.88	6.17	3.61
SRQFAV	10.07	6.17	7.08	3.42
SRQFAR	21.07	10.97	14.67	8.63
ACTSGS	37.67	8.84	37.67	10.91
ACTSWT	35.80	6.65	33.67	5.97
ACTSRI	27.80	7.03	27.67	7.71
ACTSSS	20.1.	7.55	21.42	5.11
SSQA	54.73	14.70	54.25	8.56
SES	435.67	163.20	541.25	114.64

Table 6. Correlations among outcome measures ($n=27$)

Measures	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. STAI-S		.57**	.02	.18	.16	.24	.15	.36	-.20	.10	.24	.08	-.22	-.08
2. BDI-II			.35	.22	.20	.47*	.65**	.55**	-.24	.23	.25	-.30	-.36	-.16
3. IESRA				.41*	.55**	.29	.59**	.28	.31	.30	.02	-.37	-.01	-.26
4. IESRI					.74**	.56**	.07	.46*	.08	.02	.03	.04	.24	-.36
5. IESRH						.51**	.25	.65**	.28	.39*	.12	-.26	.04	-.39*
6. SRQFIN							.54**	.81**	.25	.35	.38	-.30	-.31	-.23
7. SRQFAV								.52**	.10	.51**	.22	-.42*	-.32	-.15
8. SRQFAR									.14	.42*	.44*	-.31	-.26	-.31
9. ACTSGS										.45*	.21	.12	.21	-.18
10. ACTSWT											.39*	-.12	-.22	-.14
11. ACTSRI												.20	-.18	.28
12. ACTSSS													.63**	.27
13. SSQA														.07
14. SES														

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

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

Table 7. ANCOVAs: Comparisons of treatment and control groups at post-treatment, controlling for pre-treatment scores – two samples

Measure	Completers (<u>n</u> = 27)		Intent-to-treat participants (<u>n</u> = 33)	
	<u>F</u> (2, 24)	<u>p</u>	<u>F</u> (2, 30)	<u>p</u>
STAIS	4.43	.046	1.95	.173
BDI-II	7.87	.010	2.14	.154
IESRA	5.10	.033	2.72	.109
IESRI	2.65	.116	.83	.370
IESRH	1.54	.227	.09	.769
SRQFIN	5.21	.032	1.78	.192
SRQFAV	14.68	.001	5.39	.027
SRQFAR	2.86	.104	.52	.475
ACTSGS	27.26	.000	27.26	.000
ACTSWT	2.93	.105	2.83	.105
ACTSRI	2.71	.113	2.71	.113
ACTSSS	1.64	.213	1.64	.213
SSQA	.79	.382	.56	.460
SES	7.48	.012	2.70	.111

Table 8. Effect sizes for dependent measures

Measure	<u>ES</u>	Measure	<u>ES</u>
STAIS	.99	ACTSGS	2.00
BDI-II	1.00	ACTSWT	.69
IESRA	.65	ACTSRI	.49
IESRI	.60	ACTSSS	.49
IESRH	.62	SSQA	.18
SRQFIN	.72	SES	.87
SRQFAV	1.01		
SRQFAR	.55		

Table 9. Number of participants who met two different criteria for clinical significance and comparisons on the critical ratio.

Measure	2 <u>SD</u> for cutoff scores				1.5 <u>SD</u> for cutoff scores			
	Treatment (<u>n</u> = 13)	Control (<u>n</u> = 14)	t	p*	Treatment (<u>n</u> = 13)	Control (<u>n</u> = 14)	t	p*
STAIS	3 (23.0%)	0	1.91	<.05	7 (53.8%)	1 (7.1%)	2.66	<.01
BDI-II	4 (30.7%)	1 (7.1%)	1.58	ns	8 (61.4%)	2 (14.3%)	2.54	<.05
IESRA	4 (30.7%)	2 (14.3%)	1.03	ns	9 (69.2%)	4 (28.6%)	2.11	<.05
IESRI	6 (46.1%)	2 (14.3%)	1.81	< .05	7 (53.8%)	5 (35.7%)	0.95	ns
IESRH	--	--	--	--	5 (38.5%)	2 (14.3%)	1.43	ns
SRQFIN	--	--	--	--	2 (15.4%)	0	1.53	ns
SRQFAV	--	--	--	--	2 (15.4%)	1 (7.1%)	0.68	ns
SRQFAR	--	--	--	--	2 (15.4%)	0	1.53	ns
ACTSGS	6 (46.1%)	0	2.88	<.01	7 (53.8%)	0	3.19	<.01
ACTSWT	4 (30.7%)	2 (14.3%)	1.03	ns	9 (69.2%)	5 (35.7%)	1.74	<.05
ACTSRI	1 (7.7%)	0	1.06	ns	3 (23.0%)	2 (14.3%)	0.59	ns
ACTSSS	2 (15.4%)	0	1.53	ns	3 (23.0%)	0	1.91	<.05
SSQA	1 (7.7%)	1 (7.1%)	0.05	ns	2 (15.4%)	1 (7.1%)	0.68	ns
SES	7 (53.8%)	3 (21.4%)	1.74	<.05	9 (69.2%)	4 (28.6%)	2.11	<.05

*: 1-sided

Table 10. Partial correlation between post-treatment symptom scores and coping change scores, controlling for pre-treatment symptom scores ($n = 27$).

Dependent Measure	Partial out	ACTSGS change	ACTSWT change	ACTSRI change	ACTSSS change	SSQA change	SES change
Post STAIS	Pre STAIS	.26	-.36*	.20	.14	.47**	.49**
Post BDI-II	Pre BDI-II	.29	-.28	.29	.23	.42*	.47**
Post IESRA	Pre IESRA	.06	-.50**	.09	.27	.26.	.37*
Post IESRI	Pre IESRI	.14	-.40*	.15	.27	.42*	.44*
Post IESRH	Pre IESRH	.01	-.44*	.08	.07	.33	.53**
Post SRQFIN	Pre SRQFIN	.34*	-.31	.05	.48**	.40*	.40*
Post SRQFAV	Pre SRQFAV	.30	-.37*	.14	.24	.29	.39*
Post SRQFAR	Pre SRQFAR	.11	-.57**	.20	.31	.37*	.58**

** Correlation is significant at the 0.01 level (1-tailed).

* Correlation is significant at the 0.05 level (1-tailed).

CURRICULUM VITAE

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EDUCATION

- 2002: Ph.D. Clinical Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA
Title: An Internet-based self-change program for trauma sequelae.
Committee: George Clum (Chair), Russell Jones, Thomas Ollendick, Robert Stephens, Richard Winett
- 1999: M.S. Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA
Title: Cross-cultural comparisons of factors related to help-seeking attitudes toward psychological disorder
Committee: George Clum (Chair), Thomas Ollendick, Robert Stephens
- 1989: B.S. Physics, Keio University, Tokyo, Japan

PROFESSIONAL POSITIONS

July 2002 – present

Associate Director, Trauma and Anxiety Disorders Clinic, Central Michigan University, Mt. Pleasant, MI
Director: Elizabeth Meadows, Ph.D.

July 2001 – June 2002

Clinical Psychology Intern, The University of Texas – Houston Medical School, Houston, TX
Director: Melinda Stanley, Ph.D.

GRANT

- 2001 Graduate Research Development Project, Virginia Polytechnic Institute and State University, Blacksburg, VA
- 1998 Graduate Diversity Research Mentoring Program, Virginia Polytechnic Institute and State University, Blacksburg, VA

INVITED ADDRESSES

- February 02* Using interpreters in therapy for refugees. Interfaith Ministries, Houston, TX
- March 97* Cross-cultural perspectives of psychological disorders and treatment seeking behavior, Columbia Montgomery Regional Hospital, Christiansburg VA

PUBLICATIONS

Hirai, M., & Clum, G. A. Development, reliability and validity of the beliefs toward mental illness scale (2000). *Journal of Psychopathology and Behavioral Assessment*, 22(3), 221-236.

Clum, G., Esposito, C., Hirai, M., & Nelson, W. (2000). The relative contribution of diagnostic and psychosocial variables to severity of suicidal ideation. *Journal of Psychopathology and Behavioral Assessment*. 22(1), 79-90.

MANUSCRIPTS UNDER REVIEW

Hirai, M, Stanley, M., & Novy, D. Generalized Anxiety Disorder in Hispanics: symptom characteristics and prediction of severity.

Scarpa, A., Van Voorhees, E., Hurley, J., Francisco, J., Hirai, M., Ollendick., T. Emotional, behavioral, and psychophysiological correlates of reactive and proactive aggression in children.

MANUSCRIPTS IN PREPARATION

Hirai, M. & Clum, G. A meta-analytic study of self-help interventions for anxiety disorders.

Hirai, M. & Clum, G. An Internet-based self-help program for trauma consequences.

Hirai, M., & Morgan, S. Relationships among anxiety, depression, and anger in an adolescent inpatient population.

Lachar, D., Bailey, S. & Hirai, M. Chapter: Brief Psychiatric Rating Scale.

PEER-REVIEWED PRESENTATIONS

Symposia

Clum, G., Hirai, M., & Chandler, H. (2001). A meta-analysis of self-help interventions: current findings and future prospects. Paper presented as part of symposium at the World Congress of Behavioral & Cognitive Therapies, Vancouver, Canada, July.

Scarpa, A., Hirai, M., Fikretoglu, D., Bowser, F., & Romero, N. (2000). Emotional and behavioral problems in reactive and proactive aggression. Paper presented in the oral session of the Kansas Conference in Clinical Child Psychology, Lawrence, October.

Hirai, M. & Clum, G. (2000). A theoretical model linking treatment of trauma-consequences with self-change. Paper presented as part of symposium at the 46th annual convention of the Southeastern Psychological Association, New Orleans, April.

Clum, G., Chandler, H., Hirai, M., & Nelson, W (2000). New directions in trauma research : assessment, process, adjustment, and self-treatment. Paper presented as part of symposium at the 46th annual convention of the Southeastern Psychological Association, New Orleans, April.

Hirai, M., Nelson, W., & Clum, G. (1999). Web-based assessment program for panic sufferers. Paper presented as part of symposium at the 45th annual convention of the Southeastern Psychological Association, Savannah, March.

Clum, G., Hirai, M., & Nelson, W. (1999). The validation and clinical utility of the Panic Coping Inventory. Paper presented as part of symposium at the 45th annual convention of the Southeastern Psychological Association, Savannah, March.

Jeffrey, A., Clum, G., Hirai, M., & Nelson, W. (1999). Assessment of trauma coping skills. Paper presented as part of symposium at the 45th annual convention of the Southeastern Psychological Association, Savannah, March.

Nelson, W., Clum, G., Esposito, C., & Hirai, M (1999). The relative importance of diagnostic and psychosocial factors in predicting suicidality. Paper presented as part of symposium at the 45th annual convention of the Southeastern Psychological Association, Savannah, March.

Poster presentations

Hirai, M., & Morgan, S. (2002) "Relationships among anxiety, depression, and anger in an adolescent inpatient population." Poster presented at the Kansas Conference in Clinical Child Psychology, Lawrence, October.

Hirai, M. & Clum, G. (2001). Pilot study: an internet-based assessment for trauma sequelae. Poster presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Philadelphia, November.

Hirai, M. & Clum, G. (2001). A comprehensive meta-analysis of self-help for anxiety disorders. Poster presented at the 47th annual convention of the Southeastern Psychological Association, Atlanta, March.

Hirai, M. & Clum, G. (2000). A meta-analysis of bibliotherapy for anxiety disorders. Poster presented at the annual meeting of the Association for the Advancement of Behavior Therapy, New Orleans, November.

Hirai, M. & Clum, G. (2000). A theoretical model linking treatment of trauma-consequences with self-change. Poster presented at the annual meeting of the Association for the Advancement of Behavior Therapy, New Orleans, November.

Hirai, M. & Clum, G. (1999). Development, reliability and validity of the beliefs toward mental illness scale. Poster presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Toronto, Canada, November.

Hirai, M., & Clum, G. (1999). Cross-cultural factors predicting help-seeking behavior. Poster presented at the 45th annual convention of the Southeastern Psychological Association, Savannah, March.

Nelson, W., Hirai, M., & Clum, G. (1998). An examination of the coping strategies of panic sufferers. Poster presented at the Virginia Polytechnic Institute and State University Graduate Research Symposium, March.

OTHER PRESENTATIONS

Hirai, M. (2002, June). Generalized Anxiety Disorder among Hispanics. Presented at the University of Texas Houston, Mental Science Institute, Research Conference, Houston, TX

Hirai, M. (2002, April). Frontal lobe lesion – personality change and behavioral problems. Presented at the University of Texas Houston, Mental Science Institute, Clinical Case Conference, Houston, TX

Hirai, M. (2002, February). Preliminary report: An Internet-based self-help program for trauma sequelae. Dartmouth-Hitchcock Medical Center, Lebanon, NH

Hirai, M. (2002, February). Short-term therapy for Borderline Personality Disorder. Presented at the University of Texas Houston, Mental Science Institute, Clinical Case Conference, Houston, TX

Hirai, M. (2001, December). Anger, anxiety, and depression in an adolescent inpatient population. Presented at Harris County Psychiatric Center, Research Conference, Houston, TX

CLINICAL EXPERIENCE

July 02 – present

Postdoctoral Fellow, Trauma and Anxiety Disorders Clinic, Central Michigan University

Director: Elizabeth Meadows, Ph.D.

July 01-June 02

Clinical Psychology Intern, The University of Texas-Houston Medical School, Health Science Center
Supervisors: Patricia Avrill, Ph.D., Joy Breckenridge, Ph.D., J. Ray Hays, Ph.D., JD., David Lachar, Ph.D., Bud Lile, M.D., Anu Matorin, M.D., Sharon Morgan, Ph.D., Cynthia Santos, M.D., Melinda Stanley, Ph.D., & Alisha Wagner, Ph.D.

May 99 – August 99

Clinical Externship, Carilion Saint Albans Hospital, Radford VA
Supervisor: Richard Seidel, Ph.D.

May 98-August 98

Summer Practicum, Psychological Services Center and Child Study Center, Virginia Polytechnic Institute and State University
Supervisor: Thomas Ollendick, Ph.D.

August 97-April 98

Child Assessment Team, Child Study Center, Virginia Polytechnic Institute and State University
Supervisor: Thomas Ollendick, Ph.D.

August 96-April 99 & August 00-April 01

Clinical Practicum, Psychological Services Center and Child Study Center, Virginia Polytechnic Institute and State University
Supervisors: George Clum, Ph.D., Lee Cooper, Ph.D., & Robert Stephens, Ph.D.

TEACHING EXPERIENCE

July 2002-present

Supervisor, Central Michigan University
Supervise doctoral candidates in research and clinical work. Supervisor: Elizabeth Meadows, Ph.D.

January02-Mar 02

Lecturer, *Cognitive-Behavioral Treatment*, The University of Texas Houston Medical School
Supervisor: Anu Matorin, MD.

Fall 00 & Spring 01

Instructor, *Abnormal Psychology*, Virginia Polytechnic Institute and State University
Supervisor: George Clum, Ph.D.

Fall 99

Teaching Assistant, *Disorders of Children*, Virginia Polytechnic Institute and State University
Instructor: Angela Scarpa-Freedman, Ph.D.

Fall 98 & Spring 99

Instructor, *Recitation- Introductory Psychology*, Virginia Polytechnic Institute and State University
Supervisor: George Clum, Ph.D.

Fall 99

Guest lecturer, *Social Psychology*, Virginia Polytechnic Institute and State University
Instructor: Cynthia Lease, Ph.D.

PROFESSIONAL DEVELOPMENT

Memberships

American Psychological Association
Association for the Advancement of Behavior Therapy

Reviews

Cognitive and Behavioral Practice, Ad Hoc Editorial Consultant
Behavior Therapy, Ad Hoc Editorial Consultant
Journal of Gender, Culture, and Health, Ad Hoc Editorial Consultant

OTHER EXPERIENCE

Summer 99– Fall 99

Computer and network technical support, Virginia Polytechnic Institute and State University
Spring 98
Computer support, Virginia Polytechnic Institute and State University

OTHER SKILLS

Language: Japanese
Computer: Operating systems, Programming languages, Microsoft Word, Excel, Access, &
FrontPage, SPSS, SAS, and others major software, hardware, telecommunication network
integration, Internet

OTHER WORK EXPERIENCE

1995-1996 Computer & Internet engineer, Sony Communication Network Systems, Tokyo, Japan
1989-1994 Telecommunication researcher, Nippon Telegraph and Telephone, Tokyo, Japan