

SUSTAINED AND SHIFTING ATTENTION DURING EMOTIONAL AROUSAL AMONG
SEXUALLY VICTIMIZED WOMEN

by

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(Under the Direction of Karen S. Calhoun)

ABSTRACT

Sexual assault is a prevalent problem in today's society and significant research has been directed toward the question of what increases risk for sexual assault. Studies have yet to provide a definitive answer, but a consistently strong predictor of future sexual assault is history of sexual victimization. One possible explanation for this connection is that sexual assault history leads to poorer risk recognition. This study explored an approach to threat perception focusing on attention processes that could enhance the understanding of how revictimization occurs. The study found no differences between women with different sexual victimization histories on performance on sustained and shifting attention tasks. The study did find that trauma history and psychological variables moderated this relationship. These results that attention may play a role in revictimization, but based on the influence of third variables. Limitations and future directions were also discussed.

INDEX WORDS: Sexual assault, Sexual revictimization, Shifting attention, Sustained attention, Trauma, PTSD, Risk recognition

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DEDICATION

This is dedicated to my husband, Joshua Apple, whose support, encouragement, and wisdom sustained me through this project.

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CHAPTER 1

INTRODUCTION

Sexual assault is a prevalent problem in today's society and significant research has been directed toward the question of what increases risk for sexual assault. Studies have yet to provide a definitive answer, but a consistently strong predictor of future sexual assault is history of sexual victimization. One possible explanation for this connection is that sexual assault history leads to poorer risk recognition. This study explored an approach to threat perception focusing on attention processes that could enhance the understanding of how revictimization occurs.

Prevalence and Consequences of Sexual Assault

A nationally representative study reported that 15% of college women have been raped and 24% have experienced either attempted rape or sexual coercion during the ages of 14 to 24 (Koss, Gidycz, & Wisniewski, 1987). More recent reports have indicated slightly different rates of sexual assault depending on screening questions, population characteristics, and referenced timespan; however, these reports still indicate a significant problem. A sample of 8,000 women randomly surveyed by telephone indicated a lifetime prevalence rate of 14.8% for completed rapes and 2.8% for attempted rapes (Tjaden & Thoennes, 2000). A survey of 4,446 college women reported a victimization rate of 27.7 rapes per 1,000 female students, with 1.7% experiencing completed rape and 1.1% attempted rape in the past 6 months (Fisher, Cullen, & Turner, 2000). The majority of these assaults were perpetrated by acquaintances with 9 out of 10 offenders being known to their victims (Fisher et al., 2000).

In addition to the social and moral reasons that sexual victimization should be prevented, it has been related to dissociative disorders, suicide, interpersonal problems (Cloitre, Scarvalone, & Difede, 1997), somatic symptoms (Marhoefer-Dvorak, Resick, Hutter, & Girelli,

1988; Kimerling & Calhoun, 1994), poorer physical health (Kimerling & Calhoun, 1994), anxiety and anxiety disorders, depression (Resick, 1993), sexual problems, and sleep disturbances (Follette, Polusny, Bechtle, & Naugle, 1996).

Revictimization

Numerous studies have attempted to identify vulnerability factors for future sexual victimization. A variety of possibilities have been identified, but two factors that are consistently related to future victimization are alcohol use and previous victimization experiences (Fisher et al., 2000; Koss & Dinero, 1989; Himelein, Vogel, & Wachowiak, 1994). The latter has been the focus of recent work because of its consistently strong, significant effect and the uncertainty about the mechanisms of its effect. Mandoki and Burkhart (1989) were among the first to identify a “vicious cycle” of sexual victimization. A more recent review article also found significant relationships between childhood sexual abuse and adult sexual and physical assault (Polusny & Follette, 1995) and a national survey found that women who were raped before age 18 were more than twice as likely to be raped as adults (Tjaden & Thoennes, 2000).

Although the majority of studies linking sexual victimization history with future sexual assault have used retrospective designs, a study with a prospective design found similar results. Specifically, over a 3-month period, women who experienced a rape or attempted rape in childhood were more than twice as likely as nonvictims to be sexually revictimized in some manner (Gidycz, Coble, Latham, & Layman, 1993). The childhood experience influenced adult victimization directly and through its relationship to adolescent victimization – namely that childhood victimization was strongly linked to adolescent victimization which was then significantly predictive of adult victimization. A subsequent study with a 9-month follow-up showed that a woman’s chances of being victimized in one time period increased with greater severity of victimization in the previous time period (Gidycz, Hanson, & Layman, 1995).

Theories of Revictimization

A few theories have been posited to account for this high risk among a subset of the population, especially with regard to women sexually abused in childhood. Finkelhor and Browne (1985) suggested that children experience four traumagenic dynamics as a result of abuse – traumatic sexualization, betrayal, stigmatization, and powerlessness. These dynamics affect children's orientation to the world and distort their self-concept, world view, and affective capacities. The traumatic sexualization can lead to sexually risky behaviors that put women at risk for future sexual abuse. The feelings of shame and guilt from stigmatization can lead to other risky behaviors such as substance abuse and prostitution, which have been linked with higher risk of sexual assault. The sense of betrayal can lead to impaired judgment about the trustworthiness of people and the low self-efficacy resulting from powerlessness can affect capabilities in subsequent sexually threatening situations.

Gold, Sinclair, and Balge (1999) expanded this model, stating that the traumagenic dynamics have a negative psychological impact leading to an impaired sense of self and others, lower self-esteem, tendencies to self-blame, difficulties in decision-making about relationships, inability to evaluate risky sexual situations, and a greater need to maintain romantic relationships. These psychological problems lead directly to revictimization as well as to an increased number of sexual partners, which is a vulnerability factor for revictimization. Child sexual abuse also results in an internal, global, and stable attributional style and avoidant coping style, both of which have been linked with increased substance use and more sexual partners, and which could also directly lead to revictimization. Finally, difficulties with attachment style could lead to hyperfemininity, a trait that is related to poor relationship choices and many sexual partners.

A related theory of learned helplessness was originally applied to depression, but Peterson and Seligman (1983) suggested that it could also be a model for revictimization. They suggested that people learn during the initial victimization episode that resistance is futile and

this reaction could lead to later problems with emotional numbing and passivity. The passivity could then affect an individual's ability to respond effectively to a potentially threatening situation in the future or could lead to being a target of perpetrators. Perloff (1983) also suggested that the experience of victimization "shatters the illusion of invulnerability" that people carry with them. This new feeling of vulnerability could lead to negative psychological effects, such as anxiety and depression. It is also possible that a shift to a negative self-image occurs with feelings of self-blame and helplessness that prevents adequate self-protection in the future. This theory of learned helplessness in revictimization has largely been discredited as an adequate explanation for the phenomenon.

A fourth theory is the notion by van der Kolk (1989) that a "repetition compulsion" exists, whereby people compulsively expose themselves to situations reminiscent of the original trauma because they are unable to integrate the trauma into their self-concept. The victims repeat the trauma on a behavioral, emotional, physiological, and neuroendocrinological level. This theory lacks any substantial empirical support in the literature.

The few currently existing theories of revictimization have either been discredited as failing to adequately explain the occurrence of revictimization or have yet to be subjected to rigorous testing and can be viewed as preliminary attempts or models to explain the significant finding of revictimization. Further work needs to be done to explain how factors such as psychological distress and low self-esteem increase the risk of future sexual assault, in part to determine how prevention efforts could better target these variables. This is especially important because sexual assault prevention programs that are efficacious in decreasing the incidence of sexual assault for women without a sexual assault history have historically not been effective for women with a sexual assault history, suggesting that different mechanisms are at work in revictimized women (Hanson & Gidycz, 1993).

Vulnerability Factors for Revictimization

Researchers have attempted to identify correlates and predictors of revictimization, but the results are unclear and the temporal relationship of these factors is uncertain. In the realm of demographic and personal history characteristics, unemployment and transiency are related to revictimization (Miller et al., 1978). Women with multiple sexual partners and brief sexual relationships are likely to report more than one incident of sexual victimization (Wyatt, Guthrie, and Notgrass, 1992; Arata, 2000; Mandoki & Burkhart, 1989). Studies also found that history of physical abuse was a potential vulnerability factor for adult sexual assault (Cloitre, Tardiff, Marzuk, Leon, & Portera, 1996; Collins, 1998). However, other studies have shown that demographic and personal history characteristics do not differentiate single and multiple incident victims (Sorenson, Siegel, Golding, & Stein, 1991).

Consequently, more emphasis has been placed on identifying possible psychological vulnerabilities, similar to those proposed in the various theories of revictimization. Some coping styles might mediate the relationship between childhood abuse and victimization in adulthood and attachment styles possibly moderate this relationship (Irwin, 1999). Shame and self-blame were significant predictors of adult victimization among survivors of childhood sexual abuse, but dissociation was not (Kessler & Bieschke, 1999; Sandberg, Matorin, & Lynn, 1999; Arata, 2000). Other studies have found that posttraumatic symptomatology moderated the link between previous and subsequent victimization (Sandberg et al., 1999; Arata, 2000). However, a number of studies have found null results, failing to find connections between assertiveness, dependency, self-esteem, attributional style, mental disorders, general functioning, interpersonal functioning, or family environment, and revictimization, leaving investigators puzzled about what is leading to this phenomenon (Gidycz et al., 1995; Sorenson et al., 1991; Mandoki & Burkhart, 1989).

The discrepancy in these results may reflect differences in the methods of the various studies. There are inconsistencies across researchers as to the definition of revictimization,

some focusing on any type of unwanted sexual contact while others only including rape and attempted rape as measures of victimization. Also, there are differences in populations, with a number of studies conducted on mainly white college students, who are at high risk but who are also higher functioning, and other studies focusing on clinical populations or help seeking victims from rape crisis centers. Discrepancies also exist in the definitions of child, adolescent, and adult sexual assault, with some researchers counting any unwanted sexual experience under the age of 18 as child sexual abuse and others including an adolescent age category. Differences in assessment measures and operational definitions of the concepts could affect results. Finally, this literature suffers from a paucity of prospective studies, relying heavily on retrospective designs that sometimes have a significant time lag since the victimization experience. The retrospective nature of the studies could significantly affect recall as well as not allowing the differentiation of causes from effects.

Breitenbecher (2001) recently reviewed empirical investigations of sexual revictimization in an attempt to draw some conclusions. She stated that “vulnerability-enhancing past experiences and vulnerability-enhancing situational variables have received the strongest empirical support (p. 417).” She found partial support for situational variables, such as alcohol and drug use by perpetrators and victims and the victim’s history of multiple sexual partners, as vulnerability factors. Among interpersonal variables, there was mixed support for higher risk among dependent women or those with dysfunctional interpersonal schemas. No support existed for traumatic bonding or a compulsion to repeat the trauma as vulnerability factors and empirical support was weak for attributional style, self-esteem, or self-blame as vulnerability factors. Also, coping strategies did not differentiate revictimized from non-revictimized women. Poor psychological adjustment, typically operationalized as outcomes on depression, anxiety, social adjustment, and global distress measures, was related to revictimization.

Threat Perception

The strongest finding from the Breitenbecher (2001) review was the connection between diminished threat perception and sexual revictimization. Results from this literature are mixed, but it shows promise as an area for further research. A recent paper by Wilson, Calhoun, & Bernat (1999) used an audiotaped sexually coercive scenario and tested when sexual revictimized women, in comparison to nonvictimized and singly victimized women, thought the situation had “gone too far” and would leave the situation. They measured this willingness to leave by reaction time latency. They found that revictimized women would leave significantly later than the other two groups, results that were replicated in a subsequent prospective study (Marx, Calhoun, Wilson, & Meyerson, 2001).

However a similar study with videotaped scenarios did not show any differences based on victimization history. Women either viewed a videotape of a couple on a date that had numerous risk factors for sexual assault or viewed a control videotape and then identified any experiences that would have made them “uncomfortable” if they had been in the portrayed scenario. Women with histories of sexual victimization did not differ from women without such histories in the perception of general or rape-related threat cues. The recognition of threat cues was also not significantly correlated with subsequent sexual victimization in a 5-month follow-up period (Breitenbecher, 1999). A final study found no differences between recently victimized and non-victimized women in appraising the risk of a dating situation in a written scenario (Cue, George, and Norris, 1996).

The varied results among these studies could reflect differences in screening criteria for victimization status, content of the tasks, or instructions for the tasks. It is possible that measuring a reaction time for when a situation had “gone too far” was measuring a different construct than identifying cues that made subjects “uncomfortable.” Also, the Cue et al. (1996) study measured revictimization only as an assault occurring in the past six months which could easily obscure differences between victimized and non-victimized women. It is also possible that

analogue studies are not able to capture the subtleties in risk recognition difficulties occurring in revictimized women. However, these disparate results do illustrate the tentative nature of conclusions about difficulties in threat perception for revictimized women.

Some authors have linked difficulty perceiving threat to the high levels of dissociation frequently seen among child and adult sexual abuse survivors (Sandberg et al., 1999). However, even though retrospective studies report a relationship between the two variables (Cloitre et al., 1997), prospective studies have failed to find a link between dissociation and subsequent victimization and dissociation does not appear to mediate the relationship between victimization history and risk recognition (Sandberg et al., 1999; Wilson et al., 1999).

Another possibility is that posttraumatic symptomatology, such as emotional numbing or hyperarousal, prevents victimized women from perceiving threat. Cloitre (1998) argued that the absence of “floods of fear” in response to threatening situations can prevent appropriate fight-or-flight responses. Although revictimized women do score higher on measures of posttraumatic symptomatology (Wilson et al., 1999), at least one prospective study found that this failed to predict subsequent revictimization in a follow-up period (Sandberg et al., 1999). One interesting finding, though, was that even though PTSD symptoms as a whole did not differentiate risk recognition abilities, revictimized women with higher levels of *arousal* symptoms had risk recognition similar to non-victimized women, while revictimized women with lower levels of arousal had poorer risk recognition. Wilson et al. (1999) suggested that the arousal symptoms could somehow be protective by sensitizing women to danger cues.

Although the results from these studies are inconclusive, they indicate that any study of threat perception in revictimized women should take into account the level of dissociative and PTSD symptoms, because they could be factors that explain a significant part of the variance.

Attention

A different element of threat perception that has some empirical support in trauma populations is attention, e.g. diminished attentional capacities in sexually victimized women that

could lead to a greater risk of revictimization. Support for this concept originates in a few related areas of the trauma literature, including work on brain injury among trauma survivors and reduced memory and attention among persons with PTSD diagnoses.

Studies of trauma survivors have shown significantly smaller hippocampal volume, with variations depending on type of trauma. Researchers first examined combat veterans diagnosed with PTSD and found smaller right hippocampal volume that was associated with verbal memory deficits (Bremner et al., 1995). These results were replicated in a subsequent study that found reduced right and left hippocampal volume in combat veterans with PTSD in comparison to non-PTSD combat veterans and control subjects. The reduced hippocampal volume was associated with lower attention and concentration scores on neuropsychological tests (Gurvits et al., 1996). Studies of hippocampal volume were also conducted in women victimized by childhood sexual abuse and decreased left hippocampal volume was found compared to non-victimized women. This difference held even for groups that did not differ in PTSD diagnosis (Stein, Koverola, Hanna, Torchia, & McClarty, 1997). Smaller hippocampal volume has also been shown in studies of depressed subjects, which is interesting considering the high comorbidity between depression and PTSD (Bremner, 1999). Researchers theorized that the differences in lateralization of hippocampal damage could have resulted from the abuse occurring in earlier developmental stages for childhood sexual abuse victims. What is especially interesting about the hippocampus is the role it plays in new learning and memory and how damage could affect, for example, ability to assess potential threat during a life-threatening situation (Bremner, 1999).

A number of explanations have been proposed for the discrepancies in hippocampal volume. It is possible that these differences existed pretrauma and therefore simply explain vulnerabilities to developing PTSD, although the study by Stein et al. (1997) demonstrated that a PTSD diagnosis was not necessary for hippocampal shrinkage. From these studies, it is

impossible to know about pretrauma hippocampal volume. Another hypothesis is that increased glucocorticoids during times of stress cause damage to the hippocampus (Bremner, 1999).

An intriguing finding related to stress hormones and revictimization is that rape victims with a previous physical or sexual assault had significantly lower levels of cortisol after a subsequent sexual assault than did women experiencing their first sexual assault. Although not all these women developed PTSD, the lower cortisol level is consistent with cortisol levels in people suffering from chronic PTSD (Resnick, Yehuda, Pitman, & Foy, 1995). This reduced cortisol level may reflect an adaptive blunting of responsiveness in the cortisol system to chronic stress (Bremner et al., 1996). Reduced cortisol levels have been linked to impaired attention and concentration in other tasks, such as exam situations (Born, J., Hitzler, V., Pietrowsky, R., Pauschinger, P., & Fehm, H.L., 1988; Vedhara, K., Hyde, J., Gilchrist, I.D., Tytherleigh, M., & Plummer, S., 2000).

Neuropsychological tests of PTSD have found deficits in attention and memory. Initial studies were conducted with combat veterans who had chronic PTSD and a number of comorbid disorders, such as substance abuse, and found deficits in verbal learning and visual attention abilities (Uddo, Vasterling, Brailey, & Sutker, 1993). Subsequent studies with Vietnam and Gulf War veterans found poor performance on memory and attention tasks for PTSD diagnosed subjects. Specifically, they had significant difficulties with sustained attention, rather than selective or shifting attention (Vasterling, Brailey, Constans, & Sutker, 1998; Vasterling et al., 2002). One important difficulty with veteran populations, especially Vietnam veterans, is the significant level of comorbid disorders, including substance abuse, that could easily lead to cognitive deficits. Jenkins, Langlais, Delis, & Cohen (2000) looked at attention in rape victims and found that rape victims with PTSD performed significantly worse on sustained and divided attention tasks than rape victims without PTSD and control groups. There was no significant difference between groups on the measure of shifting attention. However, these rape survivors were not screened for past victimizations, so it is uncertain of their revictimization status. One

study did look at revictimized women and found that women with a history of childhood sexual abuse who had a recent sexual assault had greater selective attention for trauma related words (Field, Classen, Butler, Koopman, Zarcone, & Spiegel, 2001). This study did not look at general effects of revictimization on attention, however, and used a different definition of revictimization than other studies.

A recent study by Luscher (2001) did look at memory and sustained attention in a group of revictimized college women. She found that revictimized women made significantly more omission and commission errors on the sustained attention task than non-victimized women. Revictimized women also had difficulty remember thematic information on a memory task, although they were able to remember details as well as non-victimized women. Luscher (2001) suggests that these cognitive deficits could lead to difficulty attending to relevant information and controlling impulsive responses in threatening situations as well as failing to pick out the themes of threat and danger in these ambiguous situations. This current study is partially a replication of the Luscher (2001) study, but also extends it to look at shifting attention as well as effects of emotion.

Elements of Attention

Previous studies of attentional deficits in PTSD have looked at different aspects of attention based on two models. One was developed by Mirsky and colleagues (Mirsky, Pascualvaca, Duncan, & French, 1991; Mirsky, Fantie, & Tatman, 1995) who used principal components analysis on a neuropsychological test battery to determine four components of attention: 1) focus-execute: the ability to select a target item for processing and respond to it rapidly, 2) sustain: the ability to maintain this focused alertness over time, 3) shift: the ability to flexibly change attentive focus, and 4) encode: the ability to process information sequentially. The four components of this model also have identified perceptual-motor tests to accompany them and have been used in a number of studies evaluating memory and attention in PTSD. Strauss, Thompson, Adams, Redline, & Burant (2000) attempted a confirmatory factor analysis

of this model and were unable to fit either the proposed model or a model with correlated factors to the data, suggesting that the four components of attention might not be completely separate entities.

Posner and Petersen (1990) also offered subdivisions to the attention system, although they only designated three processes and proposed accompanying anatomical mechanisms. Orienting is changing the priority given a stimulus and involves disengaging one stimulus and engaging with a different stimulus, which is similar to the shifting attention identified by Mirsky and colleagues (Mirsky et al., 1991, 1995). Alerting attention is defined as achieving and maintaining a vigilant state, reflecting similar principles to the Mirsky et al. (1991, 1995) component of sustained attention. The final type of attention according to Posner is executive function, or resolving conflicts among responses.

Sustained/alerting attention has consistently been affected in trauma survivors with PTSD and would serve an important function in a threatening situation. Although shifting/orienting attention has not proven as yet to be affected by trauma history, it is possible that different measures of shifts in attention, such as ability to disengage attention, would illuminate the deficits in this attention process. The ability to shift the focus of attention would also be important in potentially threatening situations. These two types of attention will be referred to from this point on as sustained attention and shifting attention.

Attention and Emotion

Previous studies of attention in PTSD and trauma survivors have used neuropsychological tests conducted in a neutral mood state. However, research has demonstrated that emotional state can have a dramatic effect on allocation of attentional resources. Attentional biases toward threat have been well-established in clinically anxious patients (MacLeod, Mathews, & Tata, 1986). One study showed that at some point during processing information, emotion and cognition are truly integrated and equally contribute to the control of thought and behavior. This means that certain functions are enhanced in particular

mood states while others are impaired (Gray, Braver, & Raichle, 2002). A recent fMRI study revealed that the brain separates emotion and attention into two parallel streams in the prefrontal cortex and integrates the two in the anterior cingulate cortex. Interestingly, an increase in emotion led to a decreased ability for attention and vice versa, suggesting that level of emotional arousal is a very important factor in attention (Yamasaki, LaBar, & McCarthy, 2002). A recent study demonstrated that negative affect is associated with a decreased ability to shift attention to a new focus, specifically to disengage attention (Compton, 2000). Because sexual assault victims will often be in anxious or aroused moods while in potentially risky situations, it could be important to determine if emotional state interacts with victimization history to increase deficits in attention.

Summary and Rationale for Study

Sexual assault is a prevalent problem in our society and has negative social and psychological consequences for victims. A consistent vulnerability factor for future sexual victimization is previous victimization and rape prevention programs have been mostly unsuccessful in reducing future victimization in the revictimized population. It is possible that revictimized women have cognitive deficits from increased stress during victimizations that leads to memory and attention problems. These problems could affect ability to perceive threat in ambiguous situations, which encompasses the majority of sexual assault situations. These attention deficits could be even more apparent when women are emotionally aroused, which would also be common in sexually risky situations. Therefore, this study examined the attention capacities of revictimized women while emotionally aroused and compare these abilities with a variety of control groups.

Hypotheses

Research Question 1 – Differences in attention based on victimization status: A main effect for victimization status was predicted such that participants with no victimization history were expected to perform better on tasks of shifting and sustained attention than participants

with either a childhood sexual abuse history or those with adolescent or adult sexual victimizations. No differences were predicted between the performances of the two victimization groups, although they might exist based on the developmental stage at the time of the first sexual victimization. Exploratory analyses investigated whether these differences were affected by severity of childhood sexual abuse, adult physical abuse history, level of PTSD symptoms, dissociative symptoms, or level of depression, which have all been connected to attention or threat perception difficulties.

Research Question 2 – Differences in attention based on victimization status and emotional state: An interaction between victimization status and emotional arousal was predicted such that participants with no victimization history were expected to perform better on shifting and sustained attention tasks during anxious arousal than participants with a victimization history. These differences in attention should be more apparent during the anxious state than during the neutral emotional state. Exploratory analyses assessed whether any attention differences were affected by severity of childhood sexual abuse, physical abuse history, level of PTSD symptoms, dissociative symptoms, or level of depression.

CHAPTER 2

METHOD

Participants

Participants were 145 undergraduate women enrolled in introductory psychology classes at the University of Georgia and recruited through the research participant pool. They completed a demographic questionnaire, the Sexual Experiences Survey, and a child sexual abuse screening in large groups and those meeting criteria for the study were asked if they would like to participate in a related study about attention for additional research credit. Inclusion criteria for the attention study were female gender, 18 years or older, no history of head injury, and victimization history consistent with one of the three selected groups. The three groups were 1) no history of child, adolescent, or adult sexual victimization (no victimization group), 2) at least one incident of childhood victimization and one incident of adolescent or adult sexual victimization (CSA group), or 3) multiple incidents of adolescent or adult sexual victimization (RV group). Physical abuse history was considered in posthoc analyses. Adolescence was defined as 14 years or older, which is consistent with previous studies of this type (Gidycz et al., 1993). Participants with only child sexual victimization experiences were excluded based on previous research indicating that child abuse alone is not a good predictor of adult victimization (Gidycz et al., 1993). Also, participants with single adolescent or adult victimization experiences were excluded because of the study's focus on revictimization. Groups that differentiated between child and adult experiences reflected the possible differences that age of victimization can have on attention and brain structures (Bremner, 1999).

Materials

Demographic questionnaire. The self-report questionnaire assessed age, year in school, race, relationship status, and history of head injury.

Childhood sexual abuse. Participants responded to nine items developed by Finkelhor (1979) to screen for childhood sexual abuse. The scale consisted of specific questions about experiences before the age of 14 that reflected various degrees of severity. Respondents answered with a yes/no format to questions such as, "Did another person show his/her sex organs to you?" Participants also answered questions about victim's age at the time of the reported events, age of the perpetrator(s), relationship of perpetrator(s), amount of force used, and duration of sexual abuse. Childhood sexual abuse was defined as endorsement of one item on the scale perpetrated by someone at least 5 years older than the victim. Participants were then placed in one of the following three categories delineated in Gidycz et al. (1995): 0) *No victimization*: individuals who experienced no childhood sexual victimization; 1) *Moderate victimization*: individuals who experienced behavior such as fondling or exposure of sexual organs; and 3) *Severe victimization*: individuals who experienced rape or attempted rape. Those participants who experienced moderate or severe victimization were eligible for the study.

A continuous measure of abuse severity, as described in Mayall and Gold (1995), was also calculated from the questions about duration (once=1; less than one month=2; one month to one year=3; more than one year=4); force (no force=0; verbal threats=1; physical threats=2; physical force=3; weapon use or physical sequela=4); type of sexual act (fondling=1; masturbation=2; attempted intercourse=3; intercourse=4); and relationship of perpetrator to victim (stranger=1; acquaintance/friend=2; relative=3; father/stepfather=4). Total severity scores ranged from 3 to 16 and were used in post-hoc analyses to determine if severity of childhood abuse differentially affected attention. Variations of this measure have been used in numerous previous studies of victimization (Gidycz et al., 1993; Mayall & Gold, 1995; Gidycz et al., 1995; Kessler & Bieschke, 1999; Sandberg et al., 1999; Arata, 2000).

Adolescent/adult sexual victimization. Participants were assessed with the Sexual Experience Survey (SES; Koss & Oros, 1982), a self-report questionnaire that asked behaviorally specific questions about a variety of sexually coercive experiences. Respondents

were asked to indicate if they have ever experienced forced sex play, attempted rape, or rape from age 14 to the present. Adolescent or adult victimization was defined as endorsing one of the last 7 items on the SES, which were attempted or completed forced sexual intercourse because of coercion, threats, alcohol, or physical force or sexual acts perpetrated with physical force.

The items have a two stage response: respondents are first queried about certain sexual experiences and then asked to note the number of times the situation occurred. A sample item is, "Have you had sexual intercourse when you didn't want to because a man threatened or used some degree of physical force (twisting your arm, holding you down, etc.) to make you?" Sexual intercourse is defined in the instructions as "penetration of the woman's vagina, no matter how slight, by a man's penis. Ejaculation is not required."

The SES has good internal consistency ($\alpha=.74$), good 1 week test-retest reliability (.93) and good correlation with interviewer based measures of sexual assault experiences ($r=.83$, $p<.001$; Koss & Gidycz, 1985). Also, because the questions are behaviorally based (rather than inquiring about rape history) the questionnaire avoids the confound that many women do not identify sexually coercive experiences as rape.

Physical abuse. The Conflict Tactics Scale-2 (CTS2; Straus & Hamby, 1996) is a 39-item self-report questionnaire that assesses a range of behaviors related to intimate partner violence. Each item has two questions that assess for perpetrating and experiencing various forms of violent behavior. Because this study focused on victimization experiences, the perpetration questions were not used. Participants were given the instructions that there are times when couples disagree and they have many different ways of settling their differences. They were then instructed to circle the number of times their partner did the various identified acts in the past year. Sample items are, "My partner destroyed something belonging to me" and "My partner punched or hit me with something that could hurt." The possible responses ranged from 0 (this has never happened) to 6 (More than 20 times in the past year) with an alternative

response being 7(not in the past year, but it did happen before). Items were scored by adding midpoints for the different response categories. For example, for Category 3 (3-5 times), the midpoint is 4.

There are a number of scales and subscales in the CTS-2. Five scales exist (negotiation, psychological aggression, physical assault, sexual coercion, and injury) that have items measuring cognitive and emotional negotiation methods and minor and severe abusive behaviors. It is also possible to determine chronicity of abuse or assess abuse prevalence with a dichotomous measure. Because the Sexual Experiences Survey was used to assess coercive sexual experiences and the negotiation scale is irrelevant to the current study, only the psychological aggression, physical assault, and injury scales from the CTS-2 were used in analyses.

Psychometric results for the CTS-2 were based on a study of 317 undergraduate students in sociology and criminal justice classes who were at least 18 and had one heterosexual romantic relationship of at least 1 month duration in the previous year. Subscales had good internal consistency ($\alpha=.79-.95$), with reliabilities as high or higher than the CTS1. Straus and Hamby (1996) measured construct validity by correlating psychological aggression, physical assault, and sexual coercion, and found the predicted results of a higher correlation for men than for women. They also correlated physical assault and injury scales and psychological aggression and physical assault scales and found correlations in the predicted directions for gender. Therefore, the scale has good preliminary construct validity. They also found good discriminant validity by showing low correlations between negotiation and sexual coercion and negotiation and injury (Straus & Hamby, 1996).

PTSD measures. The Los Angeles Symptom Checklist (LASC; King, King, Leskin, & Foy, 1995) measures PTSD symptoms across a variety of trauma populations. Although it does not assess for the occurrence of a traumatic event or for feelings of fear, helplessness, and horror, it does have items that correspond fairly closely with the DSM-IV criteria for PTSD. It has

43 items that are words or phrases assessing a variety of traumatic symptoms on a 5-point scale for severity ranging from 0 (not a problem) to 4 (extreme problem). Sample items include, “nightmares,” “irritability,” “excessive jumpiness,” and “difficulty concentrating.” A diagnosis of PTSD can be assessed from endorsement of 1 reexperiencing symptom, 3 avoidance symptoms, and 2 arousal symptoms. A partial PTSD diagnosis is also possible or a continuous measure of PTSD severity can be calculated by summing the 17 items reflecting PTSD symptoms. Also, a sum of all 43 items provides a global assessment of distress and interference from the trauma.

A dataset of subjects from 10 studies reflecting a diverse set of populations, including battered women, Vietnam veterans, and childhood sexual abuse survivors, demonstrated high internal consistency for the test items involved in PTSD diagnosis ($\alpha=.94$) and the total score ($\alpha=.95$). Test-retest reliability over 2 weeks for a sample of 19 Vietnam veterans was .94 for the 17-item PTSD score and .90 for the total scores. A factor analysis of scores yielded 3 factors accounting for 40.8% of the variance. Factor 1 was primarily represented by items from the PTSD scale. Factor 2 reflected physical manifestations of stress and Factor 3 tapped into deficits in interpersonal functioning. PTSD scores from the LASC were moderately, but significantly, related to other self-report measures of PTSD (r s ranging from .38 to .48) and diagnoses based on the LASC had a sensitivity rate of 70% and a specificity rate of 80% when compared with diagnoses from a structured clinical interview (Orsillo, 2001).

Dissociation. Dissociation was assessed with two measures. The first is a very new scale developed by Briere (2002) entitled the Multiscale Dissociation Inventory (MDI). It is a 30-item self-report measure of a variety of dissociative symptoms. Each item is rated on a frequency scale from 1 (never) to 5 (very often). It has six subscales with good alphas reliabilities: disengagement ($\alpha=.83$), depersonalization ($\alpha=.90$), derealization ($\alpha=.90$), emotional constriction/numbing ($\alpha=.94$), memory disturbance ($\alpha=.74$), identity dissociation ($\alpha=.75$), and total dissociation ($\alpha=.96$). The MDI has been standardized on a group of 444 individuals with a

trauma history and has good psychometric properties in trauma, community, and university samples.

Because of the preliminary nature of the MDI, a more well-established, although flawed, measure of dissociation was also used. The Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986) has been used in over 400 published studies on a variety of populations. It consists of 28 items that describe dissociative experiences including amnesia, depersonalization, and derealization. A sample item is, "Sometimes people have the experience of finding new things among their belongings that they do not remember buying. Circle a number to show what percentage of the time this happens to you." Subjects respond on a 100-point scale, divided into 10 percentage point increments, to indicate how often they have each experience. A total score is calculated by adding all the items and dividing by 28. A score of 30 is used as a cutoff point to define a participant as high in dissociation. It is also possible to use 3-factor scores that separate dissociative experiences into those more common in the general population (absorption and imaginative involvement) from those indicative of more serious psychopathology (amnestic dissociation, depersonalization and derealization). Internal consistency from a meta-analysis was high ($\alpha=.93$) and test-retest reliability over 4-8 week intervals ranged from .79-.96. It showed excellent convergent validity with other self-report and interview measures of dissociation (Orsillo, 2001).

Depression. The Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; Beck, Steer, & Garbin, 1988) is a 21-item self-report inventory assessing symptoms of depression, ranging from guilt and irritability to loss of appetite. Respondents rate each item on a scale from 0 to 3, with anchors for the different items varying depending on the symptom assessed.

Extensive psychometric studies have been conducted on the BDI, with internal consistencies ranging from .73 to .92 with a mean of .86. Test-retest reliabilities range from .48 to .86, depending on the length of the interval between administrations and the population. The

BDI demonstrates moderate to high correlations (.55 to .96) with clinical ratings of depression for psychiatric patients and moderate correlations with other depression rating scales (.73-.76). The BDI was also able to discriminate psychiatric from non-psychiatric populations (Groth-Marnat, 1999).

Mood induction. Anxious emotion was induced with a variation of the Written Autobiographical Recollection Induction Procedure (Baker & Gutterfreund, 1993) as described by Holdwick and Wingenfeld (1999). Participants were asked to think for 10 minutes about the two most socially anxious events of their life, imagining all the details of the experience. They then answered a series of questions about the events, such as their age at the time or their location. This procedure has been shown to produce marked increases in self-reported anxiety. Imaginative mood inductions have been shown to be as effective as the Velten, music, film/story, social interaction, and feedback methods for inducing negative moods (Westermann, Spies, Stahl, & Hesse, 1996; Gerrards-Hesse, & Spies, 1994). Control subjects were given a short article to read about house design and then answered a series of questions, such as "Did you think the article was interesting?"

Manipulation check. The short form of the Profile of Mood States questionnaires (POMS; McNair, Lorr, & Droppleman, 1971; Shacham, 1983) was used to determine if the mood manipulation was effective. The original POMS lists 72 adjectives which participants can rate from 0 (not at all) to 4 (extremely) as to how they describe her current mood. Average response across items can then be calculated for each of the 8 subscales (Anxiety, Depression, Anger, Fatigue, Confusion, Vigor, Friendliness, and Elation) or for composite measures of negative affect (Anxiety, Depression, Anger, Fatigue, and Confusion) or positive affect (Vigour, Friendliness, and Elation). The short POMS has 37 items, reflecting 6 of the subscales in the POMS (anxiety, depression, anger, fatigue, confusion, and vigor). Correlations between the original scales and the shortened scales range from .95 to .98. Also, internal consistencies ranged from .80 to .90 for the shortened scale.

Shifting attention/orienting task. The Posner covert orienting task (COVAT) is a classic measurement of attentional orienting ability. In this task, participants respond to peripheral targets while maintaining a centrally fixed gaze. Targets are preceded by a visual cue which may occur in the same place as the subsequent target (valid cues) or in the opposite location from the target (invalid cues). Typically, response times are faster for trials with valid cues than with invalid cues, if the time delay between cues and targets is brief (less than 300ms). With longer time delays, participants are able to scan the visual field and actually respond more quickly to invalid trials, a phenomenon referred to as “inhibition of return” (Posner & Cohen, 1984). An additional measure from this task is ability to disengage attention, which is best assessed in invalid brief delay trials when participants must disengage attention from the invalid cue and then shift to the target.

Participants were seated in front of a computer screen that displayed three boxes in a horizontal line. They were instructed to fix their gaze on the central box and to press a key on the keyboard as soon as a target square was detected in either the far right or far left box. They were told that some trials included a valid or invalid cue for the future location of the target. This cue consisted of the right or left box becoming bold for 250 ms. Participants were presented with 480 trials, presented in 10 blocks of 48 trials. Trials consisted of non-cued, valid cued, and invalid cued trials and response times were recorded for each trial.

A number of measurements were possible from this task, but the ones of interest for this study were mean reaction time (which has been used in a previous study of attention dysfunction in rape victims; Jenkins et al., 2000), and reaction time on invalid trials (which has been used as a measure of disengaging attention; Compton, 2000)

Sustained attention task. The Continuous Performance Test (CPT; Rosvold et al., 1956) is the most frequently used sustained attention task in research and has been used in numerous studies of attentional deficits in combat veterans and sexual assault victims (Jenkins et al.,

2000; Vasterling et al., 1998; Uddo et al., 1993; Sutker et al., 1995). Studies have shown it to be one of the more sensitive measures to brain injury (Cicerone, 1997).

Multiple modifications have been made to the CPT over the years. However, the basic elements of all versions are the rapid presentation of a long series of stimuli with instructions for the subject to respond whenever a target or target sequence is presented. The Identical Pairs Version (CPT-IP), in which subjects search for two sequential identical letters, has been shown to be more difficult than other versions, but able to detect more subtle deficits (Cornblatt & Keilp, 1994). The CPT-IP uses more complex stimuli and a different definition of a target stimulus, which increase the information processing load of the task.

A computerized form of the CPT-IP was used. Participants were told to respond as quickly as possible when two identical stimuli were presented in sequence by pushing a designated key on the keyboard. Stimuli were presented for 1-second with a 1-second interstimulus interval (ISI) and target trials comprised twenty percent of the trials. A response to a target trial was considered a correct detection or a "hit." Responses to non-target trials were considered commission errors, while failing to respond to a target trial was an omission error. Omission errors, commission errors, number of hits, and mean reaction time were all used in analyses, as they have been used in sustained attention measures in previous studies with a PTSD population (Vasterling et al., 2002; Vasterling et al., 1998; Jenkins et al., 2000).

Procedure

Participants were involved in two phases of the study and consent was obtained before initial involvement in the study. Subjects completed the demographic questionnaire, the child abuse questionnaire, and the Sexual Experiences Survey in large groups to determine if they met inclusion criteria. Subjects also completed the self-report questionnaires on physical abuse, PTSD symptoms, depression, other psychological symptoms, and dissociation. Those who met the inclusion criteria of being female, 18 years or older, and no history of head injury, and who fit

into either the non-victimized group, CSA group, or RV group were offered the opportunity to complete the second phase of the study for additional research credit.

Subjects were then tested individually in the second stage of the study. Equal numbers of non-victims, CSA victims, and RV victims were randomly assigned to either an emotionally aroused or non-emotionally aroused group. The experimenters were blind to the victimization status of the participants, to avoid any possible experimenter effects. The aroused group completed the mood induction procedure, thinking for 10 minutes about two anxiety provoking events in their life and then completing a series of questions about the events to ensure compliance with the induction task. The non-aroused group read a neutral magazine article and answered questions about the content of the article. The mood manipulation was then assessed by the POMS.

Participants in both groups completed the computer attention tasks, which were counterbalanced in order to control for any fatigue effects. At the conclusion of the study, they were debriefed about the purpose of the study.

CHAPTER 3

RESULTS

Description of Sample

Participants were 145 college-aged women who participated in the study for class credit. Average age of the participants was 19.2 years ($SD=1.27$) with 66.9 percent of women being either 18 or 19 years old. The majority of the participants were freshmen in college (44.1%) with sophomores also being a significant portion of the group (29.7%). Most of the women were Caucasian (86.2%) although there were small numbers of African-American (5.4%), Asian-American (2.7%), Hispanic (1.4%), Native American (.7%) and multiracial participants (2%). Many of the participants indicated that they either dated casually (51.7%) or were in long-term monogamous relationships (35.2%), the length of which ranged from 2 months to 6 years ($M=20.7$ months; $SD=30$ months).

Sexual Assault History

Participants were divided into groups based on sexual assault experience in order to complete the second phase of the study involving two attention tasks. The first group ($N=48$) reported either no or minor (i.e., forced sex play) sexual assault experiences in childhood, adolescence, or adulthood. The second group ($N=70$) experienced attempted or completed sexual assaults in adolescence or adulthood, but no sexual assault experiences in childhood. They reported a mean of 7.2 ($SD=4.5$) sexual assaults ranging from forced sex play to forced intercourse. The frequency of these experiences ranged from 2 to 24. Looking at more severe sexual assault experiences of attempted or completed rape, this group experienced an average of 4.2 ($SD=3.2$) in adolescence or adulthood. The third group of women ($N=17$) reported childhood and adolescent/adult sexual assault experiences. The measure of child sexual abuse

does not allow computation of frequency of these experiences, but one can determine the severity of experiences. Women in this third group reported an average of 2.6 types of experiences involving exposure to sexual organs or requests to do something sexual, 1.1 types of fondling experiences, and less than 1 type of experience with either forced masturbation or intercourse. Women in this group also reported a significant number of adult sexual assault experiences ($M=9.0$; $SD=9.0$) including a number of attempted or completed rape experiences ($M=4.5$; $SD=4.9$). A fourth group of women ($N=10$), not proposed as participants but recruited because of difficulty finding adequate numbers of women with child and adolescent/adult sexual assault experiences, had child sexual abuse experiences, but no adult sexual assault experiences. These women had a mean of 2.6 different types of exposure experiences and less than 1 type of experience with forced fondling, masturbation, or intercourse.

Means and standard deviations on the other outcome measures can be found in Table 1 and correlations between the various outcome measures can be found in Table 2.

Analyses Testing Hypotheses

Manipulation check and data cleaning. Results from the anxiety subscale of the Profile of Mood States (POMS) questionnaire were compared to determine if the mood induction task was effective, i.e. participants induced into the anxious mood state had higher levels of anxiety than those in the neutral mood state. A t-test indicated there was a significant difference between groups on mood states, $t(142) = 2.89$, $p = .004$. Individuals in the anxiety condition scored a mean of 12.67 ($SD=4.84$) on the anxiety subscale of the POMS while individuals in the non-anxious condition scored a mean of 10.42 ($SD=4.48$). Therefore, future analyses considered the effect of mood on performance of attention tasks.

Scores on the reaction time tasks were cleaned in order to remove any responses due to error or extreme inattention. Extreme scores above 3000 milliseconds and below 100 milliseconds were deleted for all tasks. Then z-scores were taken for each type of task and scores above and below three standard deviations of the mean were also deleted. This reduced

the number of scores involved in the analyses by less than ten percent for the three COVAT trials, which is standard in reaction time tasks. However, because of omissions on the CPT target trials that resulted in reaction time scores of 0, the CPT scores after cleaning were reduced by 24%.

Attention and anxiety based on victimization history. In order to test the hypotheses that performance on the attention tasks would differ based on victimization history and level of anxiety, a series of analyses were performed. First, the assumptions for MANOVA were tested because of the multiple outcome measures available for both attention tasks and the interrelated nature of these variables. The outcome measures used were reaction time for invalid trials on the COVAT, mean reaction time on the COVAT, reaction time on target trials for the CPT, and commission and omission errors on the CPT. Within tasks, significant correlations existed between the two outcomes measures of the COVAT ($r=.95$, $p<.001$). Significant correlations were also shown between the number of commission and omission errors on the CPT ($r=.48$, $P<.001$) as well as between the mean reaction time on the CPT and the number of commission errors on the CPT ($r= -.34$, $p<.001$). However, the mean reaction time on the CPT and number of omission errors were not significantly correlated ($r=.06$; $p=.44$). Between tasks, there were significant correlations between all the reaction times ($r=.29$, $p=.001$ between the mean reaction times on the COVAT tasks and the target trial reaction times on the CPT and $r=.22$, $p=.01$ between the invalid task reaction times on the COVAT and the reaction times on the CPT). However, there were no significant correlations between either type of error on the CPT and either reaction time measure on the COVAT. Because of the relative consistency of correlations within tasks and the inconsistency of correlations between tasks, separate MANOVA analyses were conducted on the outcome measures for the COVAT and the CPT.

Next, depression was considered as a potential covariate because of previous research concerning the effect of depression on attention and the high rates of depression in traumatized populations. In order to test the assumptions for ANCOVA, correlations between scores on the

Beck Depression Inventory and the various attention tasks were investigated to determine if a relationship between the two might be significant and therefore important to consider when comparing groups. Scores on the BDI ranged from 0 to 52 with a mean score of 11.3 (SD=9.1). Correlational analyses revealed no significant correlations between scores on attention tasks and level of depression (r 's ranging from $-.01$ to $.16$). Therefore, depression scores were not covaried out in further analyses.

After determining that MANOVA would be the most appropriate analysis technique, a series of MANOVAs were conducted in order to examine the hypotheses that performance on attention tasks would differ by level of victimization history and by level of anxiety. Because difficulties with participant recruitment led to the addition of a fourth group, analyses of between-group differences looked at four groups with different victimization histories (no victimization, adolescent/adult revictimization, child sexual abuse and adolescent/adult victimization, and child sexual abuse only). However, the groups with child sexual abuse histories contained a much smaller number of subjects than the other two groups, so analyses were also conducted that combined these two groups and compared three different types of sexual victimization history (no victimization, adolescent/adult revictimization, and child sexual abuse).

Table 3 lists the means and standard deviations for the two different reaction time measures on the COVAT tasks for the four victimization groups subdivided by anxiety condition. A 2 (anxiety) x 4 (victimization history) MANOVA comparing reaction times on the invalid trials of the COVAT and the mean reaction times on all trials of the COVAT revealed no significant differences between groups. For the reaction times of the COVAT invalid trials, there were no differences for the overall model, $F(7, 133) = .59, p = .77$, and no differences for the interaction, $F(3, 133) = .54, p = .66$, or main effects for victimization, $F(3, 133) = .01, p = .99$, and for mood, $F(1, 133) = .44, p = .51$. For mean reaction times on all COVAT trials, there were also no differences for the overall model, $F(7, 133) = .98, p = .45$, for the interaction, $F(3, 133) = .35, p = .79$, or the main effects of victimization, $F(3, 133) = .11, p = .96$ or mood state, $F(1, 133) = 2.62, p = .11$.

Table 4 lists the means and standard deviations for reaction times on the COVAT tasks for the three victimization groups subdivided by anxiety condition. A 2 (anxiety) x 3 (victimization history) MANOVA comparing outcome measures of the COVAT across the three groups with different victimization histories found similar non-significant results as described above for the 2x4 MANOVA. For invalid COVAT trials, there were no significant differences in the overall model, $F(5, 135) = .70$, $p = .63$, main effect for victimization, $F(2, 135) = .01$, $p = .99$, main effect for mood, $F(1, 135) = 1.14$, $p = .29$, or interaction between mood and victimization history, $F(2, 135) = .49$, $p = .61$. The overall reaction time for the COVAT also showed no differences in the overall model, $F(5, 135) = 1.25$, $p = .29$, main effect for victimization history, $F(2, 135) = .14$, $p = .87$, or interaction, $F(2, 135) = .22$, $p = .81$. However the main effect for mood between the three groups was significant, $F(1, 135) = 3.90$, $p = .05$, with anxious participants having faster reaction times than non-anxious participants.

Table 5 lists the means and standard deviations for omission errors, commission errors, and mean target trial reaction times for the CPT based on the 4 victimization groups and anxiety conditions. A 2 (anxiety condition) x 4 (victimization history) MANOVA comparing these three dependent variables across victimization status and mood state showed no significant difference between groups. For omission errors on the CPT, there were no differences in the overall model, $F(7, 136) = .84$, $p = .56$, main effects of victimization, $F(3, 136) = 1.27$, $p = .29$, main effects of mood condition, $F(1, 136) = .05$, $p = .83$, or the interaction, $F(3, 136) = .61$, $p = .61$. Analyses of the commission errors on the CPT revealed the same pattern of no differences in the overall model, $F(7, 136) = .93$, $p = .49$, main effect of victimization, $F(3, 136) = .45$, $p = .72$, main effect of mood condition, $F(1, 136) = .30$, $p = .59$, or the interaction, $F(3, 136) = 1.74$, $p = .16$. Finally, there were no significant differences for mean reaction time on the CPT target task. Results showed no differences for the overall model, $F(7, 136) = 1.37$, $p = .23$, main effect of victimization, $F(3, 136) = 1.06$, $p = .37$, main effect of mood condition, $F(1, 136) = .47$, $p = .50$, or the interaction, $F(3, 136) = 2.05$, $p = .11$.

The analyses examining differences in performance on the CPT were conducted on the groups when the two conditions involving childhood sexual abuse were combined. This 2 (anxiety condition) x3 (victimization history) MANOVA also revealed no significant differences between groups for performance on the two attention tasks and results were very similar to those found when comparing four groups. One slight difference is that the interaction between victimization and anxiety condition was closer to significance than in previous tests, $F(2, 138) = 2.58$; $p = .08$, for the target trial mean reaction times, indicating a possible trend. Means and standard deviations for this comparison can be found in Table 6.

Overall, analyses across the proposed victimization histories and the two anxiety conditions revealed no significant differences between groups. It appears that contrary to Hypothesis 1, individuals with a victimization history were no slower in responding to stimuli in attention tasks than individuals without a victimization history. Hypothesis 2 was also not supported, which had proposed an interaction in that anxiety would have a greater effect on the performance of participants with victimization history than those with no such history. Computation of effect sizes revealed that for the outcome measures on the COVAT and the CPT, the partial η^2 ranged from .01 - .07 which is considered small as designated by Cohen (1973). These small effect sizes contributed to low overall power, which as determined by post-hoc power analyses ranged from .05- .50 for the COVAT measures and from .05 - .57 for the CPT measures.

Effects of trauma history and psychological variables on attention. The second part of each of the hypotheses suggested that level of trauma history and severity of certain psychological variables might also have a significant impact on performance of attention tasks. These analyses were exploratory and used continuous measures to explain differences in attention. First, linear regression analyses were conducted to see if participants with more severe trauma histories would perform more poorly on attention tasks. Child sexual abuse severity scores (calculated from type of incident, relationship with perpetrator, level of threat,

and length of experience), sexual assault frequency scores, and physical assault, physical injury, and psychological aggression scores from the Conflict Tactics Scale (CTS) were regressed onto the various outcome measures from the attention tasks. The regression models were insignificant and the variance accounted for in all the models was also small. Also, none of the individual predictors were significant, except that level of physical assault predicted number of commission errors on the CPT, $\beta=.31$, $p=.02$. Results from this regression analysis can be found in Table 7.

Second, linear regression analyses examined how various psychological variables might relate to performance on the attention tasks. The different outcomes on the COVAT and the CPT were regressed onto level of depression, PTSD scores, and level of dissociation. Different regression analyses were conducted for the dissociation scores of the Multiscale Dissociation Inventory (MDI) and the Dissociative Experiences Scale (DES) because these two measures assess the same construct and therefore have high correlations. Also, because the PTSD scale allows a number of different computations of PTSD symptoms, different regression analyses looked at the contribution of the 17 DSM-IV PTSD symptoms, the three clusters of PTSD symptoms (reexperiencing, avoidance, and arousal), and the 43 trauma symptoms that include the PTSD symptoms but also measure trauma related difficulties such as hostility, depression, and drug abuse. All regression equations were insignificant. Most of the individual predictors were also insignificant. The one exception was that higher scores on the PTSD reexperiencing cluster were a significant predictor of faster reaction times on the invalid trials of the COVAT ($\beta=-.22$; $p=.04$). These results can be found in Table 8.

Exploratory Analyses

Because the proposed analyses failed to find any significant differences between groups on performance in attention tasks and any significant historical or psychological predictors, a series of exploratory analyses was undertaken to examine other important relationships in the

dataset. These analyses involved subdividing victimization history in different ways to possibly uncover relationships not apparent in the previous classifications. The exploratory analyses also examined possible moderators between psychological variables and performance on attention tasks.

Trauma history. The first set of analyses explored how trauma history might be related to attention. Sexual assault was subdivided into four categories: attempted rape, rape perpetrated by coercion, rape perpetrated using alcohol, or rape perpetrated by force. It has been suggested that perhaps these qualities of sexual assaults are as important as frequency of occurrence. Overall, participants in the sample had a mean of .59 attempted assaults (SD=1.22), 1.27 coercive assaults (SD=1.71), .32 assaults involving alcohol (SD =.84), and .38 assaults with physical force (SD=1.52). Performance on the two attention tasks was regressed onto these four types of assaults. Results revealed that frequency of assaults involving alcohol was a significant predictor of reaction time on the CPT ($\beta=.23$, $p=.01$) in that a greater history of assaults with alcohol led to slower reaction time on target trials of the sustained attention task. Category of assault did not significantly predict any other attention task. The results from this analysis are displayed in Table 9.

Related to the effects of type of assault on attention, the effects of higher frequency of types of assaults was investigated in relation to a number of psychological variables and trauma history variables. Type of assault was found to be significantly related to PTSD symptoms, PTSD symptom clusters, depression, dissociation, and history of physical violence. With regard to PTSD symptoms, attempted ($\beta=.19$, $p=.04$), coercive ($\beta=.17$, $p=.03$), and assaults with alcohol ($\beta=.27$, $p=.001$) were significantly related to higher levels of PTSD symptoms. These results changed somewhat with the different symptom clusters. Frequency of attempted sexual assaults was significantly related to higher levels of reexperiencing ($\beta=.27$, $p=.004$) symptoms while assaults with coercion ($\beta=.25$, $p=.002$) and alcohol ($\beta=.25$, $p=.003$) were significantly

related to PTSD avoidance symptoms and frequency of assaults with alcohol was significantly related to level of arousal symptoms ($\beta=.28$, $p=.001$). Overall higher frequency of assault was related to more incidents of physical violence ($F=8.96$, $p=.000$), while experiencing assaults with physical force was a specific correlate ($\beta=.38$, $p=.000$). Assaults involving alcohol significantly predicted depression ($\beta=.22$, $p=.01$), dissociation as measured by the DES ($\beta=.28$, $p=.002$), and the depersonalization ($\beta=.28$, $p=.002$), derealization ($\beta=.26$, $p=.004$), and emotional constriction ($\beta=.47$, $p=.000$) subscales of the Multiscale Dissociation Inventory (MDI). Coercive sexual assaults were significantly related to levels of disengagement ($\beta=.31$, $p=.000$) and derealization ($\beta=.19$, $p=.03$) on the MDI.

Analyses of the relationship between child sexual abuse experiences and attention found that more severe incidents of childhood sexual abuse increased the number of commission errors on the sustained attention task, $F(2, 144) = 3.75$, $p=.03$. However, severity of childhood experiences and relationship to perpetrator had no other effect on performance of the sustained or shifting attention tasks.

Finally, history of physical violence was examined to see if higher levels of physical and sexual violence combined might lead to slower reaction times on the two attention tasks. Participants were divided into two groups based on whether they had ever experienced physical violence according to the physical assault subscale of the Conflict Tactics Scale. Out of the 145 participants, 32 had experienced some type of physical violence. A series of 2 (history of physical violence) x 4 (victimization history) and 2 (history of physical violence) x 3 (victimization history) MANOVAs were conducted on the outcome measures of the two attention tasks. A significant interaction between level of physical and sexual victimization indicated that participants with some type of child sexual abuse and physical abuse had slower times on the invalid trials of the COVAT, $F(3, 128) = 3.39$, $p=.02$, and the mean reaction time on all COVAT trials, $F(3, 128) = 3.17$, $p=.03$, across four victimization subtypes as well as three victimization

subtypes for invalid COVAT trials, $F(2, 128) = 4.58, p = .01$, and for all COVAT trials, $F(2, 128) = 4.60, p = .01$. Figures 1 and 2 show these results for the invalid trials, but there was a similar interaction pattern for the mean COVAT reaction times. These analyses were not significant for the CPT task.

Moderators. The second set of analyses explored how different psychological variables such as depression and PTSD symptoms might moderate the relationship between victimization and performance on attention tasks. First, level of PTSD symptoms and the three PTSD symptom clusters were divided by a median split into high and low groups. Using the two different groupings of victimization history, a series of 2 (trauma symptoms) x 4 (victimization history) and 2 (trauma symptoms) x 3 (victimization history) MANOVAs were conducted examining performance on the COVAT and CPT. There was a significant interaction between total level of trauma symptoms and reaction times on the CPT target trials, $F(3, 118) = 2.83, p = .04$. This interaction is illustrated in Figure 3. Participants with child and adult sexual abuse history and *low* levels of PTSD symptoms performed faster on the CPT whereas participants with only child sexual abuse history and *high* levels of PTSD symptoms performed faster on the CPT. This interaction did not hold across the three groups when the two child sexual abuse groups were combined. A different interaction emerged when analyses were restricted to the seventeen DSM-IV PTSD symptoms. In that case, participants with child and adult sexual assault history performed faster on the COVAT invalid task with high levels of PTSD symptoms while participants with only child or only adult sexual assaults performed slower with high levels of PTSD symptoms. This is illustrated in Figure 4.

For the PTSD symptom clusters, a somewhat complex series of interactions emerged from the results. There was a significant interaction between level of PTSD reexperiencing symptoms and victimization history for performance on invalid trials on the COVAT for both sets of victimization groups, $F(3, 133) = 2.83, p = .04$, for four groups and, $F(2, 135) = 3.73, p = .04$, for three groups). Because the pattern was similar for both groupings of victimization history, Figure

5 illustrates this interaction for three victimization groups. Post-hoc analyses revealed that individuals with child sexual abuse histories had faster reaction times on the COVAT invalid trials when they had high levels of PTSD reexperiencing symptoms, but this pattern was switched for participants with adolescent/adult victimization histories. For PTSD avoidance symptoms, the interaction changed slightly when looking at three or four types of victimization history. For four victimization groups, participants with adolescent/adult sexual assault histories or child sexual abuse only histories performed faster with low levels of PTSD avoidance symptoms for the invalid COVAT trials, $F(3, 133) = 4.10, p=.01$, and the mean reaction time on the COVAT, $F(3, 133) = 3.26, p=.02$, whereas participants with child and adolescent/adult experiences performed faster with high levels of PTSD avoidance symptoms. This interaction is displayed in Figure 6. However, when the two groups of participants with child sexual abuse were combined, overall history of child sexual abuse and high PTSD avoidance symptoms led to faster reaction times on COVAT invalid trials, $F(2, 135) = 2.71, p=.07$, and all COVAT trials, $F(2, 135) = 2.74, p=.07$. Figure 7 illustrates these results for invalid trials, but the pattern was the same for the overall mean reaction time on the COVAT. Finally, the same interaction between the four victimization groups emerged for PTSD arousal symptoms among participants with child sexual abuse only as compared to child and adolescent/adult assaults ($F=2.86, p=.04$). Figure 8 displays these results.

Depression was investigated as a possible moderator by splitting level of BDI symptoms into high and low groups. A series of 2 (depression symptoms) x 4 (victimization history) and 2 (depression symptoms) x 3 (victimization history) MANOVAs was conducted to examine the effects of level of depression on performance in attention tasks. Participants subdivided by four categories of victimization history showed a significant interaction between victimization history and depression scores for both the mean reaction time, $F(3, 133) = 2.74, p=.05$, and the invalid trial reaction time, $F(3, 133) = 3.51, p=.02$, on the COVAT. Participants subdivided into three types of victimization history showed close to significant interactions between victimization

history and level of depressive symptoms for the two measures of the COVAT, $F(2, 135) = 2.53$, $p=.08$ for the mean reaction times and $F(2, 135) = 2.63$, $p=.08$ for the invalid trials. These interactions are illustrated in Figures 9 and 10. Only one figure is shown for the outcomes of the invalid and mean reaction times for COVAT trials in the three and four victimization groups because the pattern is similar for both outcomes. In general, participants with higher levels of depressive symptoms were slower on the COVAT tasks, unless they had a history of child sexual abuse, or more specifically child sexual abuse and adolescent/adult victimization.

Level of dissociation was considered as a possible moderator because of the known effects of dissociation on attention. The average score on the Dissociative Experiences Scale (DES) was split into high and low groups. Also, the different subscales of the Multiscale Dissociation Inventory were divided by a median split into high and low groups. Again, a series of 2 (level of dissociation) x 4 (victimization history) and 2 (level of dissociation) x 3 (victimization history) MANOVAs were conducted for the different outcome measures on the attention tasks. Analyses revealed no significant interactions between level of dissociation and victimization history on performance on attention tasks, indicating that dissociation does not moderate this relationship.

The exploration of different moderators suggests that some differences in attention do exist based on level of PTSD symptoms and depressive symptoms. Not all of the moderation appears consistent with that expected from the different levels of victimization, but it suggests some interesting mechanisms at play in the sample.

CHAPTER 4

DISCUSSION

Summary

The anticipated differences in performance on attention tasks between participants with different victimization histories and the anticipated exacerbation of these differences in attention by increased levels of anxiety did not occur in this study. Rather, victimized women did not appear to have poorer shifting and sustained attention overall and their abilities with these cognitive tasks at times improved with higher levels of anxiety. Post-hoc analyses revealed small effect sizes and low power that led to this lack of significant differences and suggest that the hypothesized disparities in attention might not be as large as previously proposed. Other possible explanations for the null findings are considered in the conclusions.

The failure to find any consistent historical or psychological predictors of performance on the attention tasks was also surprising given that a number of the psychological variables, such as depression and dissociation, have been shown in many studies to affect attention. Also, the relationship of psychological difficulties to attention was at times contrary to predictions. For example, participants with higher levels of PTSD reexperiencing symptoms performed more quickly on a task of shifting attention. These inconsistencies suggest perhaps some unusual sample characteristics. Perhaps the sub-clinical level of psychological difficulties in the majority of the participants did not allow adequate variance for the analyses. Only 20% of the sample had moderate levels of depression or higher, only 26 participants had diagnosable levels of PTSD symptoms, and many of the participants indicated low levels of dissociative symptoms.

Analyses on the role of different types of sexual assault revealed some interesting findings about the effect of assault type on a variety of outcomes. These results emphasized the important role alcohol plays in sexual assault. Individuals with higher level of alcohol-related

assaults had slower reaction times on the sustained attention task than participants with other types of assaults meaning they were not able to pay as close attention to the stimuli for a period of time. Perhaps this difficulty is exacerbated when participants are using alcohol, leading to a greater risk for alcohol related assaults. Assaults involving alcohol were related to more PTSD symptoms, depression, and dissociation. These findings could reflect women using alcohol as a coping mechanism for the traumatic symptoms or depression, and that having this coping mechanism subsequently increases their risk for sexual victimization. Understanding how sexual assaults involving alcohol might affect attention and psychological variables is important because studies have found that from 30-75% of sexual assaults on college campuses involve alcohol (Testa & Parks, 1996).

Also interesting from analyses on different assault types was that attempted assaults had a significant impact on trauma symptoms, emphasizing the importance of assessing for all types of sexual assault experiences and that oftentimes attempted assaults can have the same negative effects as completed sexual assaults. Finally, the results indicated a relationship between number of assaults perpetrated through coercive tactics (e.g., using continual pressure or a position of authority) with avoidance measured with PTSD avoidance symptoms, disengagement, and derealization. Briere (2002) defines disengagement as “emotional or cognitive separation from one’s immediate environment” and derealization as “alteration in one’s perception of the external world.” Perhaps in this case the high levels of avoidance and difficulty of connecting with reality put these individuals at higher risk of being swayed by authority or pressure. However, because the time course of the development of avoidance in relation with the coercive assaults is unknown, perhaps instead the coercive assaults led to these individuals coping by using avoidance. Indeed, some research has indicated that coercive sexual assaults can have different impacts than those perpetrated by force (Zweig, Barber, & Eccles, 1997). Overall, the subdivision of assault type indicated that the use of coercion and alcohol played a

more significant role than the use of physical force in the negative psychological aftereffects of assaults.

Results were contrary to expectations that sexual assaults sustained in childhood would have differential effects on attention and psychological variables than those sustained in adulthood because of the impact of earlier traumas on cognitive and emotional development. Participants with childhood sexual abuse histories did not appear to differ significantly from those who had been assaulted in adulthood or those participants without a victimization history, except for individuals with severe abuse histories making more commission errors on the sustained attention task. This result suggests that more severe abuse might lead to difficulties attending to relevant information and not being impulsive. One possible reason for this overall lack of results was the relatively small number of women with child sexual abuse histories included in the sample and the necessity in many analyses of combining individuals with childhood and adult assaults with those who only had been sexually abused in childhood. It is possible that with a larger sample size and greater power, important differences would have been revealed.

At times, analysis results from participants with child sexual abuse history were opposite to those of participants with adolescent or adult sexual assault histories, such as having different interactions between psychological symptoms and attention. More specifically, overall participants with child sexual abuse history performed faster on the measures of sustained and shifting attention with higher levels of PTSD reexperiencing, PTSD avoidance symptoms, and depressive symptoms while participants with adolescent or adult sexual assaults performed more slowly with high levels of those symptoms. This interaction could suggest that participants with a child sexual abuse history are able to lessen the impact of their psychological symptoms on their attentional processes through different coping methods or that the recency of assaults more significantly impacts attention. Whatever the reason for the interaction, the differences for victimization based on these moderating factors emphasizes how experiences in childhood and

adulthood can have significantly different effects on similar processes and one should not assume that sexual abuse always manifests in the same manner.

The results demonstrated the cumulative negative effect of sexual assault and physical violence experiences on the ability to disengage and shift attention, both of which are important abilities in potentially risky situations. It appears that somehow the addition of physical violence to an individual's sexual trauma history from childhood will be enough trauma exposure to negatively impact shifting attention, while neither child sexual abuse nor physical abuse individually had a significant impact. More detailed investigations are of course necessary, but this finding points to the importance of assessing for many types of trauma when considering possible consequences. Many women who experience sexual assault will also experience physical abuse and studies have shown that the combination of types of abuse can have differential effects on psychological outcomes. In this sample, it also appeared that a dichotomous measure of presence or absence of physical abuse led to more significant results than a continuous measure of physical violence, suggesting that perhaps frequency of incidents does not matter as much as experiencing at least one episode of physical assault.

One final consideration of the results is the lack of impact of depression on attention. Because of results in previous studies, it was expected that depression would significantly impact the abilities to sustain and shift attention, to the point that it was considered as a potential covariate. However, depression was not significantly correlated with any of the outcomes on the attention measures and in investigation of possible moderators, it was found that participants actually had faster reaction times on the attention tasks when they had high levels of depression than when they had low levels of depression. Because one of the symptoms of depression is difficulty concentrating, this result is very contrary to expectations. One possibility is that the levels of depression in this sample were simply not high enough to find the relationships one would normally find with depressive symptoms. Indeed, participants in the "high" depression group had a mean score of 19.34 (SD=8.46) which is in the very low end

of the moderate range on the BDI. Perhaps then the depressive symptoms were not significant enough to negatively impact performance because they were not at a clinical level.

Conclusions

These results suggest that perhaps attention does not play as important a role in sexual victimization and revictimization as previously suggested. Rather than inability to perceive threat being the factor that increases risk for future victimization, perhaps it is self-efficacy or the ability to enact behaviors in uncertain situations that decreases risk and prevents women from being revictimized. Put another way, it is possible that women with victimization histories are able to perceive risk when it is present, but also possess a tendency to acquiesce in the risky situations which then increases risk of sexual assault.

However, this study does not disprove the importance of risk perception as a mechanism of revictimization. One possibility for the null results is a methodological issue concerning the neutral measures of sustained and shifting attention used to test basic cognitive processes. The lack of significant findings evident in this study could indicate that performance on neutral cognitive tasks without the important contextual factors often present in risky environments is an inadequate measure of threat perception in college women. Attempts to raise anxiety levels of participants to mirror emotions experienced in social situations were statistically successful, but only a two-point difference out of a 19-point scale separated the two conditions. Also, the induced anxiety might not have approximated closely enough the emotions experienced in risky situations. A final consideration about the nature of the task and the mood induction is that social situations are inherently complex and ability to shift attention from and sustain attention on neutral stimuli might just not capture the complexity adequately enough to measure ability to perceive risk in potential sexual assault situations.

Another important consideration of the results is that the null results could suggest that the division of victimization experiences was not adequate to capture the attention differences present in this population. The exploratory analyses suggest that other categorical measures of

victimization experiences might prove more helpful in predicting group differences. For example, there are large variations in the type of child abuse experienced by this sample ranging from a one-time episode of exposure from a relative to a long-term abusive relationship with a stepfather. Although infinitely subdividing the sample into more precise subunits would not be useful, it is important to consider other ways to conceptualize the experience of sexual victimization and what factors in the experience might best differentiate groups.

Although the main hypotheses of the study were not supported, post-hoc exploratory analyses did reveal some interesting differences between groups that deserve attention and could have implications in future research studies. First were the different effects of various types of sexual assaults (i.e., attempted, by coercion, with alcohol, or with force) on attention and psychological variables. Researchers typically use the Sexual Experiences Survey (SES) to collect data on sexual assault experiences and often clump all types of assaults together to form a total frequency count. Although splitting types of sexual assault experiences into infinite subgroups will not benefit researchers trying to draw conclusions about groups, perhaps researchers do need to consider whether different aspects of sexual assaults, such as the use of coercion, can sometimes matter more than the absolute number of experiences. For example, perhaps a woman assaulted once through a perpetrator using arguments and continual pressure will experience more self-blame than a woman assaulted multiple times through the use of physical force because the first woman believes she holds more responsibility for the assault. Researchers should simply consider this type of division of experience in studies, especially because it is easily done with the SES.

Second, the relationship between childhood sexual abuse and adolescent or adult sexual victimization is still unclear. Overall in this study, participants with some childhood sexual abuse history did “better” (performed more quickly, had lower levels of symptoms) than participants with only adolescent or adult assault experiences. This demonstrates that the relationship is not simply cumulative – that one does not have worse outcomes if sexual

assaults began at age six rather than at age sixteen – but that the relationship is much more complex. Perhaps there is a “recovery” of sorts achieved by the women with child sexual abuse history that allow psychological symptoms to not affect them as much or allows them to not experience such detrimental effects on attention (Gidycz et al., 1993). It could also be that the outcome measures used in this study simply did not capture the difficulties experienced by participants with sexual abuse histories and that in other areas, such as interpersonal relationships or emotion regulation, victims of child sexual abuse have more negative outcomes. However, these results emphasize the importance of not combining all types of sexual assault into one category, but carefully considering groups.

Finally, the interaction of physical and sexual abuse histories to negatively affect shifting attention abilities indicates that overall trauma (as well as different types of traumas) is also important. Although earlier points emphasized the importance of subdividing types of sexual assault experiences to ensure that differential effects were not lost in the amalgamation of trauma history, the finding about sexual and physical assault demonstrates that overall level of trauma can also have an impact. Perhaps this effect is specific to interpersonal violence or perhaps it extends to other types of traumatic experiences. However, it supports the assessment of multiple types of traumatic experiences, rather than focus on how one particular type of experience leads to one particular type of deficit. With these participants, it appears that frequency of abuse was not the most important factor.

Limitations

This study had a number of limitations that might have contributed to the inconsistent and mostly null results. The sample consisted of high-functioning college students early in their university career. Although college years are a high risk time for sexual assault, most of the participants were first or second year students and so enough time might not have passed for them to experience all the negative consequences of sexual assaults. Also, individuals with significant cognitive or emotional difficulties might not be participating in the research pool as

they would not have gained admittance to this somewhat competitive university. Most of the psychological difficulties experienced by this sample were not at a clinical level, so although trends might be apparent in relationships, perhaps difficulties need to be more severe to reflect significant relationships between constructs.

Future Directions

In future studies, it would be interesting to use different tests of attentional abilities that include references to threat and trauma. Perhaps increasing the contextual relevance of the task could lead to greater differences between groups in performance on the task. This might be more effective than trying to induce anxiety in participants in a laboratory condition. Also, increasing the sample size of participants with child sexual abuse histories would allow greater subdivision of this group to examine whether other factors besides frequency of experiences could lead to detrimental cognitive effects. Overall, considering different ways to compare groups based on victimization status could be informative. Perhaps the important mechanism for reduced risk perception is the nature of the previous assault or the relationship with the perpetrator. As the field of study into the occurrence of sexual assault matures, it will be essential to increase the precision of comparison groups.

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Table 1

Means and Standard Deviations for Psychological Outcome Variables

<u>Variable</u> (Range)	<u>Total</u>	<u>No</u> <u>victimization</u>	<u>Adolescent/</u> <u>adult</u>	<u>CSA &</u> <u>Adolescent/a</u> <u>dult</u>	<u>CSA only</u>	<u>CSA</u> <u>combination</u>
Depression (0-63)	11.32 (9.08)	8.93 (7.01)	12.73 (9.12)	13.06 (12.30)	10.90 (9.97)	12.26 (11.34)
Dissociation (DES; 0-100)	29.34 (14.45)	24.51 (13.19)	30.52 (13.91)	34.43 (16.40)	36.35 (15.46)	35.10 (15.80)
Trauma symptoms (0-172)	28.34 (18.86)	20.29 (13.68)	32.76 (19.94)	33.71 (22.64)	26.90 (14.06)	31.19 (19.87)
PTSD symptoms (0-68)	14.94 (9.77)	11.17 (6.92)	16.79 (10.31)	18.00 (12.56)	14.90 (7.95)	16.85 (11.01)
PTSD reexperiencing (0-12)	2.61 (2.24)	1.94 (1.99)	2.84 (2.29)	3.12 (2.78)	3.30 (1.25)	3.19 (2.30)
PTSD avoidance (0-24)	5.15 (4.41)	3.63 (3.09)	5.99 (4.65)	6.71 (5.50)	3.90 (4.18)	5.67 (5.15)
PTSD arousal (0-32)	7.19 (4.55)	5.60 (3.28)	7.96 (4.70)	8.18 (5.71)	7.70 (5.31)	8.00 (5.47)
Physical violence (0-300)	2.45 (7.79)	.80 (2.88)	4.09 (10.44)	.93 (2.84)	.50 (1.27)	.76 (2.31)
Depersonalization (5-25)	6.60 (2.53)	5.96 (1.80)	6.81 (2.52)	7.41 (3.83)	6.80 (2.62)	7.19 (3.39)
Disengagement (5-25)	12.74 (6.53)	11.13 (3.53)	14.23 (8.47)	12.24 (3.78)	11.00 (3.23)	11.78 (3.58)
Derealization (5-25)	8.01 (3.43)	7.14 (1.98)	8.54 (3.90)	8.94 (4.71)	6.90 (1.91)	8.16 (3.99)
Emotional constriction (5-25)	8.49 (4.26)	7.52 (3.82)	8.78 (3.83)	10.71 (6.55)	7.30 (3.06)	9.44 (5.69)
Memory disturbance (5-25)	7.34 (2.66)	6.33 (1.69)	7.94 (2.81)	7.94 (3.54)	7.00 (2.45)	7.60 (3.16)
Identity dissociation (5-25)	5.50 (1.38)	5.46 (1.34)	5.61 (1.57)	5.29 (.99)	5.30 (.67)	5.30 (.87)

Table 2

Intercorrelations Between Psychological Outcome Variables

<u>Subscale</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>
1. Depression	-	.52	.80	.82	.54	.75	.77	-.06	.51	.39	.53	.53	.55	.25
2. Dissociation (DES)	-	-	.53	.55	.36	.54	.50	-.08	.62	.43	.67	.56	.62	.32
3. Trauma symptoms	-	-	-	.96	.71	.86	.87	.05	.47	.41	.57	.51	.54	.24
4. PTSD symptoms	-	-	-	-	.76	.89	.91	.03	.48	.42	.59	.54	.55	.23
5. PTSD reexperiencing	-	-	-	-	-	.55	.60	.03	.31	.32	.36	.29	.25	.16
6. PTSD avoidance	-	-	-	-	-	-	.68	.01	.45	.40	.57	.59	.54	.19
7. PTSD arousal	-	-	-	-	-	-	-	.04	.45	.36	.54	.46	.53	.22
8. Physical violence	-	-	-	-	-	-	-	-	-.03	-.06	-.03	.08	-.02	.24
9. Depersonalization	-	-	-	-	-	-	-	-	-	.37	.80	.64	.60	.49
10. Disengagement	-	-	-	-	-	-	-	-	-	-	.49	.23	.37	.20
11. Derealization	-	-	-	-	-	-	-	-	-	-	-	.60	.66	.46
12. Emotional constriction	-	-	-	-	-	-	-	-	-	-	-	-	.65	.41
13. Memory disturbance	-	-	-	-	-	-	-	-	-	-	-	-	-	.40
14. Identity dissociation	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: All correlations $>.16$ are significant at $p >.05$

Table 3

Mean Reaction Times on COVAT Task by Victimization (4) and Mood

Victimization history	Anxiety condition	COVAT Invalid Trial (Reaction time in MS)	Mean of 3 COVAT Trial Types (Reaction time in MS)
No victimization	Anxious	489.82 (88.79)	465.40 (67.70)
	Not anxious	516.53 (53.05)	485.59 (48.34)
Adolescent/Adult revictimization	Anxious	490.89 (65.74)	452.01 (50.54)
	Not anxious	519.21 (80.33)	486.29 (73.64)
Childhood sexual abuse and adolescent/adult revictimization	Anxious	521.76 (85.84)	476.23 (64.19)
	Not anxious	492.76 (162.95)	476.59 (139.35)
Child sexual abuse only	Anxious	490.53 (82.41)	451.12 (41.19)
	Not anxious	513.63 (47.09)	495.22 (46.61)

Table 4

Mean Reaction Times on COVAT Task by Victimization (3) and Mood

Victimization history	Anxiety condition	COVAT Invalid Trial (Reaction time in MS)	Mean of 3 COVAT Trial Types (Reaction time in MS)
No victimization	Anxious	489.82 (88.79)	465.40 (67.70)
	Not anxious	516.53 (53.06)	485.59 (48.34)
Adolescent/Adult revictimization	Anxious	490.89 (65.74)	452.01 (50.54)
	Not anxious	519.21 (80.33)	486.29 (73.64)
Child sexual abuse	Anxious	507.35 (82.32)	464.64 (54.19)
	Not anxious	499.71 (132.69)	482.80 (114.17)

Table 5

Mean Reaction Times and Errors on CPT Task by Victimization (4) and Mood

Victimization history	Anxiety condition	CPT Target Trial (Reaction time in MS)	Commission Errors	Omission Errors
No victimization	Anxious	524.75 (71.20)	4.13 (3.14)	6.38 (3.93)
	Not anxious	480.46 (80.47)	5.38 (5.27)	7.17 (4.17)
Adolescent/adult revictimization	Anxious	480.96 (52.63)	6.12 (5.03)	7.68 (5.60)
	Not anxious	492.38 (64.30)	4.86 (2.40)	6.57 (3.23)
Child and adolescent/adult victimization	Anxious	475.42 (77.20)	4.00 (2.14)	7.63 (3.11)
	Not anxious	500.09 (87.49)	5.44 (2.79)	8.56 (2.13)
Child sexual abuse only	Anxious	481.15 (60.53)	6.33 (3.93)	4.83 (2.93)
	Not anxious	448.09 (51.13)	3.00 (1.63)	5.00 (3.74)

Table 6

Mean Reaction Times and Errors on CPT Task by Victimization (3) and Mood

Victimization history	Anxiety condition	CPT Target Trial (Reaction time in MS)	Commission Errors	Omission Errors
No victimization	Anxious	524.75 (71.20)	4.13 (3.14)	6.38 (3.93)
	Non-anxious	480.46 (80.47)	5.38 (5.27)	7.17 (4.17)
Adolescent/Adult Victimization	Anxious	480.96 (52.63)	6.12 (5.03)	7.68 (5.60)
	Non-anxious	492.38 (64.30)	4.86 (2.40)	6.57 (3.23)
Child Victimization	Anxious	477.88 (68.03)	5.00 (3.14)	6.43 (3.25)
	Non-anxious	484.09 (79.88)	4.69 (2.69)	7.46 (3.07)

Table 7

Commission Errors on CPT Regressed onto Trauma History

Trauma history	β	B	Significance Level
Total child sexual abuse severity	.08	.02	.42
Number of adolescent/adult sexual assault	.07	.04	.50
Physical assault	.31	.17	.02
Psychological aggression	-.23	-.03	.09
Physical injury	-.06	-.08	.49

Note. $R^2=.06$ Adjusted $R^2=.02$ for overall model. P-value of overall model= .18

Table 8

Reaction Times on COVAT Invalid Tasks Regressed onto Psychological Variables

Psychological variables	β	B	Significance Level
PTSD avoidance cluster	.07	1.29	.62
PTSD arousal cluster	.15	2.64	.33
PTSD reexperiencing cluster	-.22	-8.15	.04
Dissociation (DES)	-.01	-.06	.92
Depression	.10	.89	.51

Note. $R^2=.05$ Adjusted $R^2=.02$ for overall model. P-value of overall model= .20

Table 9

Reaction Time of CPT Target Trial Regressed onto Adult Sexual Assault Type

Assault type	β	B	Significance Level
Attempted rape	-.05	-2.72	.62
Coercive rape	-.06	-2.5	.48
Rape with alcohol	.23	18.80	.01
Rape with force	-.02	-.88	.84

Note. $R^2=.05$ Adjusted $R^2=.03$ for overall model. P-value of overall model= .11

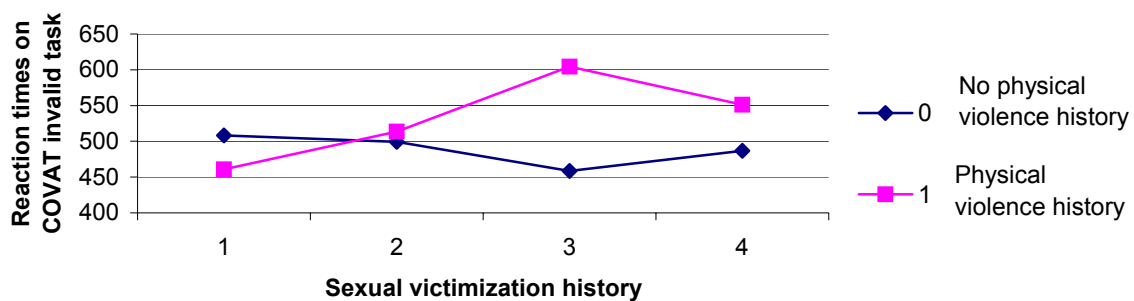


Figure 1. Relationship between physical and sexual victimization history for performance on COVAT invalid trials based on four categories of sexual victimization.

Note. For sexual victimization history: 1=No victimization; 2=Adolescent/adult victimization; 3=CSA and adolescent/adult victimization; and 4=CSA only

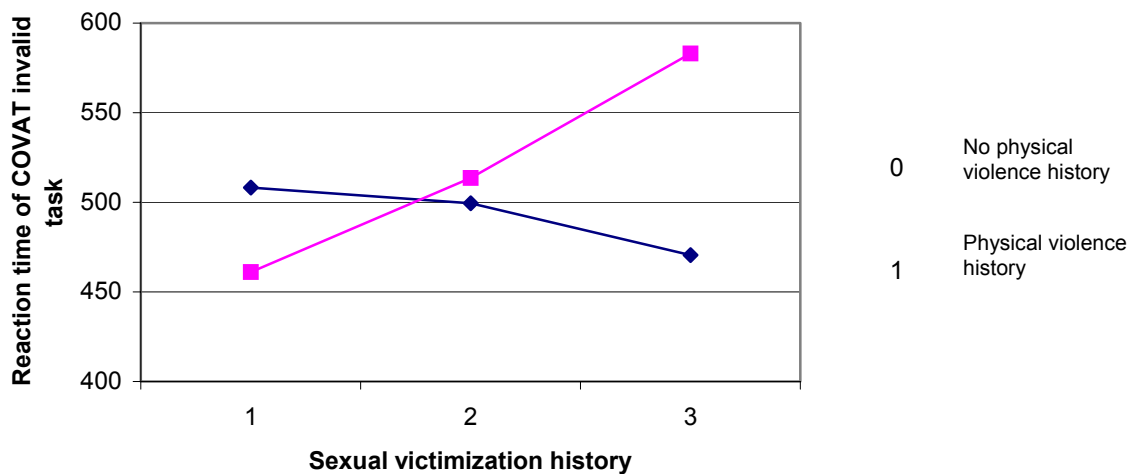


Figure 2. Relationship between physical and sexual victimization history for performance on COVAT invalid trials based on three categories of sexual victimization.

Note. For sexual victimization history: 1=No victimization; 2=Adolescent/adult victimization; 3=All CSA victimizations

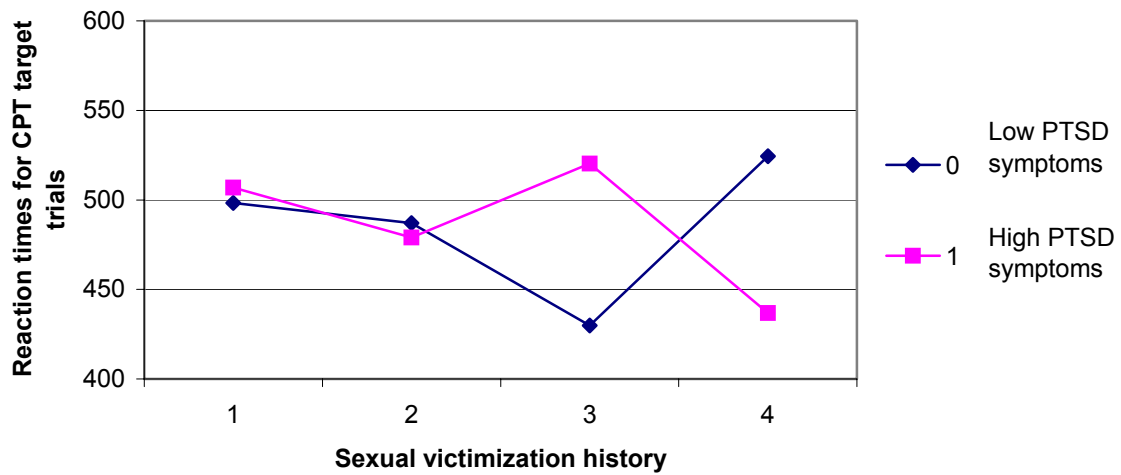


Figure 3. Relationship between total trauma symptoms and sexual victimization history for performance on CPT target trials.

Note. For sexual victimization history: 1=No victimization; 2=Adolescent/adult victimization; 3=CSA and adolescent/adult victimization; and 4=CSA only

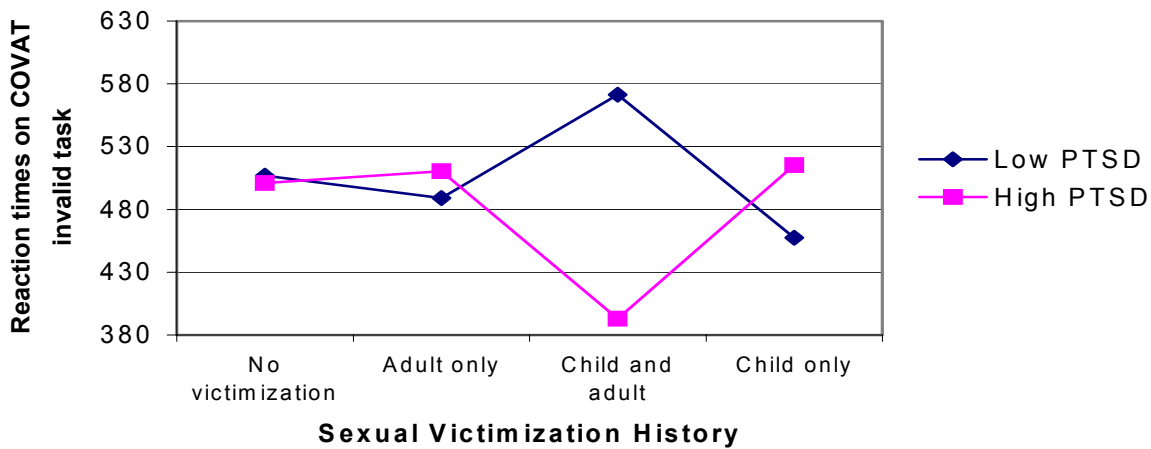


Figure 4. Relationship between PTSD symptoms and sexual victimization history for performance on COVAT invalid trials.

Note. For sexual victimization history: 1=No victimization; 2=Adolescent/adult victimization; 3=CSA and adolescent/adult victimization; and 4=CSA only

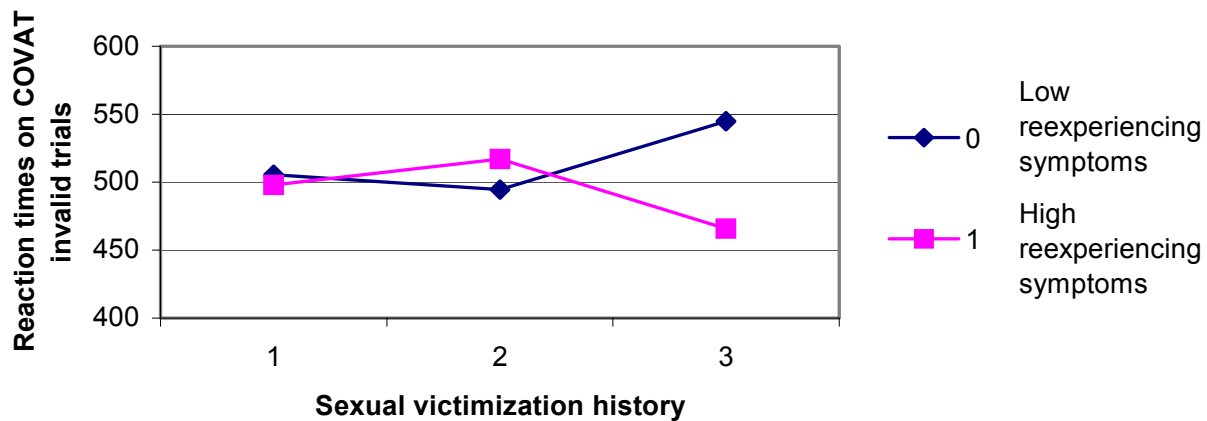


Figure 5. Relationship between PTSD reexperiencing symptoms and sexual victimization history for performance on COVAT invalid trials.

Note. For sexual victimization history: 1=No victimization; 2=Adolescent/adult victimization; 3=All CSA victimizations

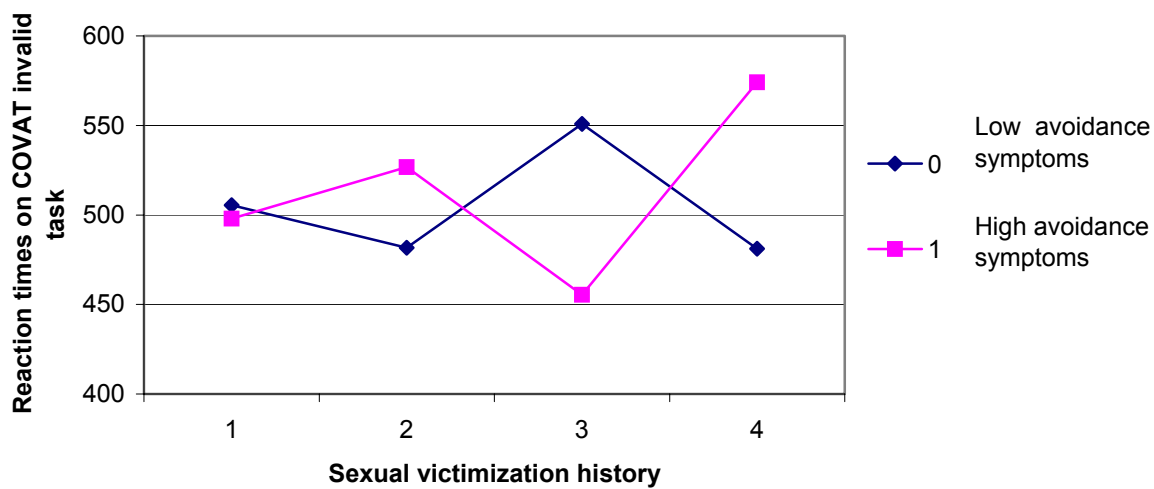


Figure 6. Relationship of level of PTSD avoidance symptoms and victimization history for performance on COVAT invalid trials

Note. For sexual victimization history: 1=No victimization; 2=Adolescent/adult victimization; 3=CSA and adolescent/adult victimization; and 4=CSA only

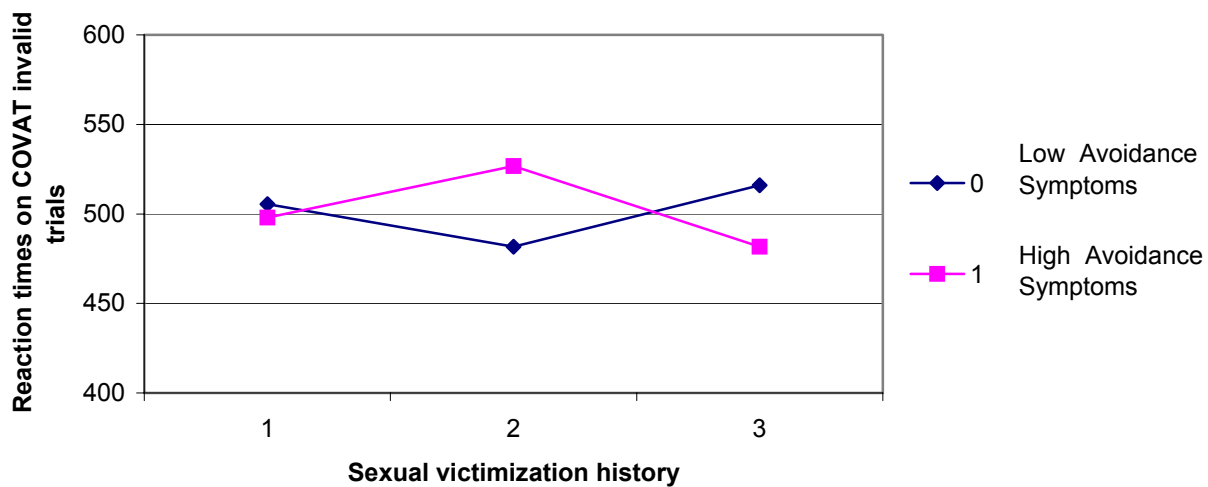


Figure 7. Relationship of level of PTSD avoidance symptoms and three categories of victimization history for COVAT invalid trials.

Note. For sexual victimization history: 1=No victimization; 2=Adolescent/adult victimization; 3=All CSA victimizations

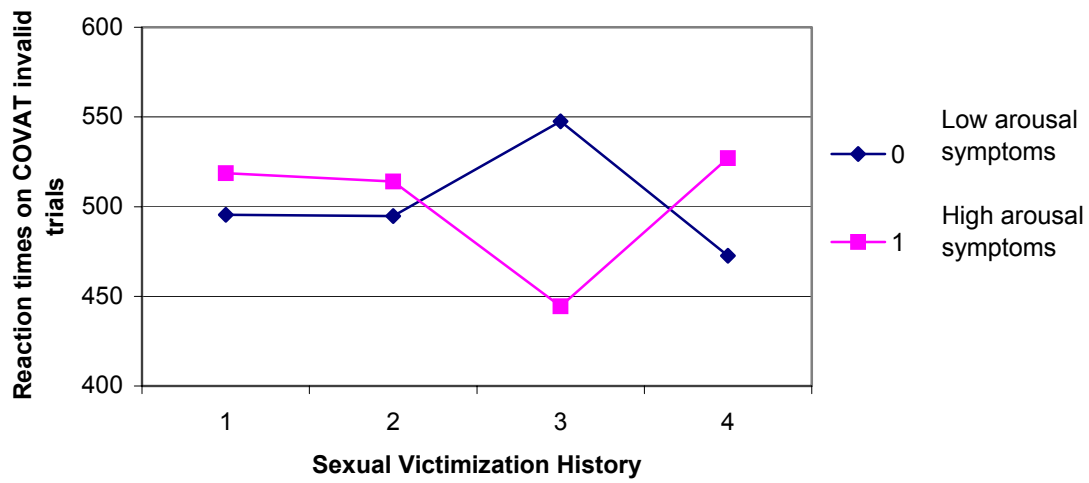


Figure 8. Relationship of level of PTSD arousal scores and four levels of victimization for COVAT invalid trials.

Note. For sexual victimization history: 1=No victimization; 2=Adolescent/adult victimization; 3=CSA and adolescent/adult victimization; and 4=CSA only

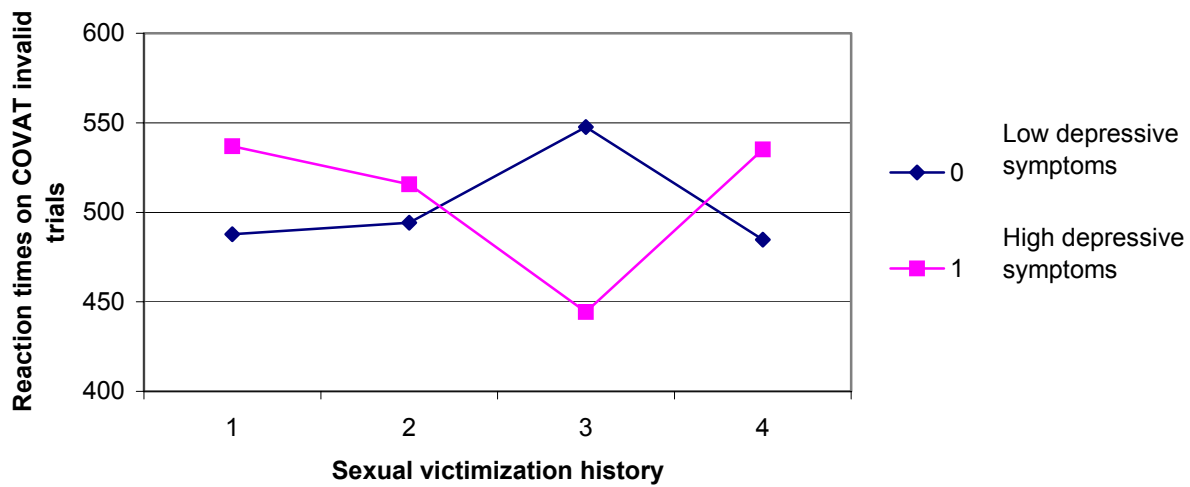


Figure 9. Relationship of level of depression symptoms and four levels of victimization history for COVAT invalid trials.

Note. For sexual victimization history: 1=No victimization; 2=Adolescent/adult victimization; 3=CSA and adolescent/adult victimization; and 4=CSA only

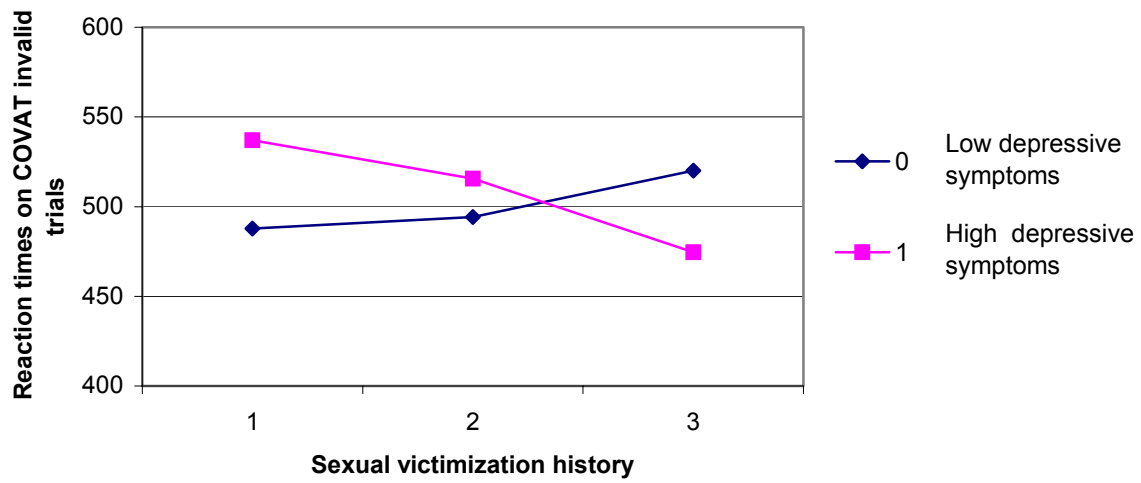


Figure 10. Relationship of level of depression symptoms and three levels of victimization history for COVAT invalid trials.

Note. For sexual victimization history: 1=No victimization; 2=Adolescent/adult victimization; 3=All CSA victimizations