The Role of Social Support and Stress Appraisals in the Relationship between Interpersonal Problems and Emotional Reactivity in Young Women with Histories of Childhood Maltreatment

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(ABSTRACT)

In comparison to their non-maltreated peers, adult survivors of child maltreatment experience more social and emotional maladjustment; however, survivors can be resilient when they have adequate psychological and social resources to cope with abuse sequelae. Similarly, stress and health studies have shown that social support schemas are stress buffers that attenuate negatively-valenced emotional reactivity. As a result of interpersonal problems, however, some individuals might interpret current relationships more negatively and expect little support in the future. Young women (ages ranging from 18 to 23) with histories of child maltreatment were administered a harassment task while their cardiac activity, emotional states, and stress appraisals were assessed. Before the stressor, the women were randomly assigned to either of two schema priming conditions: thinking and writing about a supportive person (social support schema condition) or a casual acquaintance (control condition). In comparison to women in the control condition, women in the support condition evidenced less state anger and heart rate variability (i.e., rMSSD) reactivity in response to the laboratory stressor; however, the support schema and reactivity relationship did not vary significantly between women with high versus low interpersonal problems. The support schema and state anger reactivity relationship was fully mediated by primary stress appraisals (e.g., feeling *challenged* and feeling *intimidated*), but not secondary stress appraisal (e.g., feeling in *control*). These findings suggest that there are nuances in the relationship between support schema and reactivity. Clinical and research implications are discussed.

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DEDICATION

This work is dedicated to today's innocent victims of child maltreatment who will become tomorrow's adult survivor. I hope to continue searching for knowledge and ways of serving you in this profession of clinical psychology.

This capstone of my education is also for African-American males living in or emerging from impoverished and overlooked areas of American society. I hope that my journey is a testament of perseverance.

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But thanks be to God, who always leads us in triumphal procession in Christ and through us spreads everywhere the fragrance of the knowledge of him.

(2 Corinthians 2:14, Christian Bible, New International Version)

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~ Supportive others are your most invaluable resource. ~

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I. Background and Significance

Social and Emotional Adjustment

The effective management of interpersonal relationships and emotions is important for adapting to the demands of daily life. Events occurring early in one's development (e.g., child maltreatment), however, can engender a deviant pattern of social and emotional adjustment across the life-course (Briere & Rickards, 2007; Cloitre, Scarvalone, Difede, 1997; Cloitre, Miranda, Stovall-McClough, & Han, 2005). For example, adult survivors of childhood maltreatment (hereafter referred to as adult survivors), in comparison to adults without similar histories, are more likely to report interpersonal problems: abandonment concerns, susceptibility to peer-pressure, heightened fear of social rejection, intimacy problems, mistrust of others, and verbal and physical aggression (Luterek, Harb, Heimberg, & Marx, 2004; DiLillo, 2001; Davis & Petretic-Jackson, 2000; Hulme, 2000; Edwards, Desai, Gidycz, & van Wynsberghe, 2009). Adult survivors are also more likely to report emotion-related challenges: down-regulating negative affect, social anxiety, depressive symptoms, somatization, and harmful tension reduction strategies, such as self-inflicted harm, promiscuity, suicidal behavior, and substance abuse (Orcutt, Cooper, & Garcia, 2005; Briere & Rickards, 2007; Noll et al., 2003; van der Kolk et al., 1996; Feerick & Snow, 2005; Schilling Aseltine, & Gore, 2007). There appears to be an inverse correlation of these difficulties with age of maltreatment initial occurrence, such that earlier chronological occurrence is associated with worsened social and emotional problems across the life-course (van der Kolk, et al., 1996).

These adversities likely reflect the powerful ability of early, atypical caregiver-child relationships to hamper the achievement of social and emotional developmental milestones (Cicchetti & Toth, 2005). In particular, an early maltreating relationship is believed to

compromise healthy attachment, social information-processing patterns, and emotion learning, thereby rendering social-affective incompetence and life-course maladjustment. Attachment and social cognitive perspectives have been used to explain this phenomenon such that adult survivors' maladjustment is partly attributable to sources of knowledge about interpersonal relationships (a.k.a., schemas and internal working models) that are by-products of the early caregiver-child relationships, which are carried forward across the life-course trajectory and influencing the survivor's capacity to form and maintain meaningful interpersonal relations (Cloitre, Cohen, & Koenen, 2006).

Aims of the Present Study

An exclusive focus on maladjustment would overlook a substantial amount of research also showing that survivors can be resilient when they have adequate psychological and social resources to cope with the stress of maltreatment (Johnson & Kenkel, 1991; Leitenberg, Greenwald, & Caldo, 1992; Tremblay, Martine, & Piche, 1999; Walsh, Blaustein, Knight, Spinazzola, & van der Kolk, 2007). Supportive interpersonal relationships, in particular, have been shown to ameliorate adverse social and emotional outcomes. Inherently, these supportive relationships should be consonant with adaptive versus maladaptive mental representations of relationships. Indeed, even for the adult survivor, social life is undoubtedly characterized by a mixture of supportive and problematic interpersonal relationships. Therefore, the current study was designed to investigate the ability of adult survivors' mental representations of supportive relationships to modulate emotional reactivity vis-à-vis interpersonal problems. Stated differently, the overarching question that guided this study asked whether adult survivors who have high interpersonal problems, which are engendered by maladaptive mental representations and promote maladjustment, benefit from social support schemas, which characterize supportive

relationships and are believed to promote healthy adjustment. This study's significant research findings will further the current scientific knowledge base related to the interplay of schemata (adaptive and maladaptive) in the lives of adult survivors, especially in regard to the relationships between cognition and social and emotional well-being. Social support schemata could serve as worthwhile targets for efficacious interventions, either as the intervention focal point or as a supplement to empirically supported treatments (Chambless & Ollendick, 2001). Considering the field of psychosomatic medicine, such mechanisms could also have implications for physical health—an additional area of difficulty for adult survivors (Thompson, Arias, Basile, & Desai, 2002).

Theoretical Framework

Attachment theory provides a foundation for the assumption that the atypical caregiver-child relationship influences the child's internal representation of relationships and emotions (Briere, 2002; Cloitre, Cohen, & Koenen, 2006). In order to facilitate scientific advancement, some theorists have extended speculations of attachment theory by integrating theoretical constructs and methodological approaches of the social-cognitive perspective, thereby creating more comprehensive and generative theoretical models for empirical investigation. The premises reviewed below serve as a backdrop for the present study.

Attachment Theory

Attachment theory is a psychobiological perspective which assumes that from birth children are motivated to maintain proximity to their caregivers (Bowlby, 1988; Alexander & Anderson, 1997). The product of this proximity need is an interpersonal connectedness, which is most evident during times of danger, stress, or novelty. During these times, the young child exhibits behaviors that signal to the caregiver the need for closeness and to feel soothed and

protected. The caregiver's subsequent responses influence the child's nascent mental representations of relationships: sources of knowledge (e.g., beliefs and expectations) about the self, others, and self-other interactions. For example, a consistently sensitive and responsive parent should engender a child's view of the self as love-worthy and others as dependable sources of comfort, soothing, and safety during stressful situations. These early experiences are the child's first encounters with emotion regulation abilities via social support.

In maltreatment contexts, the child's proximity seeking may be met with reprimand, outrage, minimization, disregard, physical aggression, or sexualized behavior. For these young victims "to be attached is to be abused and abuse is a way of attaching (Cloitre et al., 2002; page 92)." Consequently, the internal working models borne of maltreatment contexts are recapitulated across the life-course into interpersonal relationships that are characterized by interpersonal problems. Evidence for these theoretical assumptions is demonstrated in correlational studies using an individual differences approach to attachment where both children and adults with histories of childhood maltreatment are more likely to be categorized as insecurely attached to caregivers and intimate relationship partners in comparison to their non-maltreated peers (Cicchetti & Toth, 2005; Coe, Dalenberg, Aransky, & Reto, 1995; Styron & Janoff-Bulman, 1997; Alexander et al., 1998; Minzenberg, Poole, & Vinogradov, 2006; Liang, Williams, & Siegel, 2006; Stovall-McClough & Cloitre, 2006).

In addition to interpersonal connectedness, early attachment experiences also provide a context for learning about various emotions and emotion regulation. Although scientists have differing opinions about how to best conceptualize these constructs, herein *emotion* is viewed as a multifaceted phenomenon that includes physiological arousal, neurological activation, cognitive appraisal, attention processes, and response tendencies (Thompson, 1994). Emotions

are a kind of radar and rapid response system, constructing and carrying meaning across the flow of experience (Cole, Martin, & Dennis, 2004). They are usually elicited in the context of a given situation where the individual is subsequently motivated for approach or avoidant behavior. *Emotion regulation* is a set of processes used to dampen, intensify, or simply maintain emotion and involves the changes in emotional latency, rise time, magnitude, duration, and offset of responses in behavioral, experiential, or physiological domains (Gross & Thompson, 2007).

Maltreating caregivers evoke children's feelings of intense fright, helplessness, and anger. Since the perpetrator is also an attachment figure, this places the child in an inescapable dilemma (Kobak, Cassidy, Lyons-Ruth, & Ziv, 2006). Consequently, the maltreating environment undermines the developmental task of emotion regulation in several ways. Particularly, the maltreating caregiver-child relationship presents the victim with overwhelming, emotionally evocative situations, such as neglect and/ or abuse which may result in emotion regulation strategies that are maladaptive (e.g., dissociation, distraction, thought suppression, avoidance) outside the maltreatment environment (Briere, 2002). In addition, the abusive parent may be a poor model for learning adaptive emotion regulation by exhibiting excessive negative emotionality and impulsive behavior (Shipman, Schneider, & Brown, 2004). In comparison to non-maltreating parents, abusive parents are also less empathetic, less supportive, and more invalidating of their children's expressions of negative emotion, which also shapes the child's nascent mental representations of relationships (Shipman et al., 2007). For example, research with maltreating mothers has shown that their children, in comparison to non-maltreated children, expect less maternal support for emotional expression (Shipman & Zeman, 2001). Similarly, low paternal perceived support is predictive of survivors' increased use of harmful emotion regulation strategies (Briere & Rickards, 2007).

Advancement in the understanding of emotion regulation *processes* with adult survivors is needed. In contrast, several studies involving children have observed the unfolding of regulatory processes under experimental conditions. For example, in one study children were confronted with a simulated situation involving angry interactions between their mothers and research staff (Maughn & Cicchetti, 2002). The researchers observed and coded the children's patterns of behavior before, during, and after the task. In contrast to their non-maltreated peers, maltreated children exhibited emotionally dysregulated patterns, such as prolonged reactivity/ slow recovery, disorganized or non-goal-oriented behavior, and inhibited behavior.

Emotion regulation research with adult survivors reflects the complexity of emotional difficulties that can develop over the life-course. Specifically, adult survivors evidence clinical syndromes and behaviors indicative of deleterious emotion regulation (e.g., sexual promiscuity, impulsivity, binging and purging, substance abuse, self-injury, and para-suicidal behavior) (Polusny & Follette, 1995; Briere, 2002; Nelson et al., 2002; Springer, Sheridan, Kuo, & Carnes, 2007; Cloitre, Scarvalone, & Difede, 1997; van der Kolk et al., 1996).

An important limitation of studies with adult survivors is the reliance on non-experimental and cross-sectional designs that use self-report measures, which limit confidence in temporal cause→effect inferences. In light of this, some researchers have expressed the need to develop and use experimental approaches with adult survivors that would allow the manipulation of emotionally evocative encounters and assessment of subsequent effects on emotion regulation processes (Marx, Heidt, & Gold, 2005). Indeed, some scientists have proposed criteria for assessing emotion regulation processes in laboratory contexts. For example, Cole, Martin, & Dennis (2004) suggest that sound laboratory experiments include: (1) independent assessment of activated emotion and purported regulatory strategies; (2) analysis of temporal relations between

emotion and regulatory phenomena; (3) comparison of emotion and regulatory phenomena in contrasting conditions; and (4) use of multiple, converging measures to demonstrate predicted organization of emotion regulatory responses.

Social Cognitive Theory

For adult survivors, investigators behind non-experimental studies who are motivated by the attachment perspective provide reasonable explanations of how distal occurrences may contribute to proximal experiences; however, these studies contain methodological limitations. For example, the individual differences approach to attachment research does not easily facilitate capturing the social information-processing associated with activated internal representations—such as cognitive, physiological, and behavioral dynamics at any given moment. Additionally, the assumption that people posses a predominant attachment orientation does not reconcile with research showing that people can have a diversity of relationships characterized by different attachment qualities.

For these reasons, Baldwin and colleagues (1992; 1996) have articulated a social cognitive view of attachment processes that considers how people process social information, especially processes like encoding, storage, retrieval, and application of knowledge to a given social situation. These scientists refer to the internal representations as "relational schemas," which consist of an interpersonal script containing declarative and procedural knowledge that is based on repeated past interpersonal experiences. Each relational schema is assumed to comprise an integrated unit with three major components of social knowledge: a self-schema, other-schema, and the over-learned interaction patterns between self and other (Pierce, Baldwin, & Lydon, 1997). The relational schemas govern how incoming information is attended to and

perceived, determines which emotions are experienced, selects the memories that are evoked, and mediates the behavior with others in important relationships.

There are several features of the relational schema that are considered within the social-cognitive literature. For example, although a given individual can have a range of relational schemata in stored memory, the *availability* of a relational schema involves whether it is present in memory at any given moment during information processing (Baldwin et al., 1996). On the other hand, the *accessibility* of a relational schema involves the ease with which it is used to encode a novel stimulus. The more elaborate and expressed a particular relational schema is with multiple examples consistent with novel experiences, the more accessible it will be—a phenomenon referred to as *chronic accessibility*. Consequently, chronically accessible relational schemas are those that are activated most often in a given individuals' relationships.

Chronically accessible relational schemas are likely the cause for many of the interpersonal and emotional problems experienced by adult survivors. For instance, in order to increase adaptability to the social world, individuals should develop schemas for multiple relationships and contexts, yet adverse conditions can undermine the processes necessary for the development of these structures. In particular, maltreatment victims are typically raised in families with highly circumscribed roles and a great degree of social insularity, and therefore may have limited opportunities to develop relational schemas beyond those associated with these contexts (Cloitre et al., 2002). These rigid schemas are likely activated and reinforced during interpersonal, emotionally-laden situations that involve the management of interpersonal conflict (Cloitre, Koenen, Cohen, and Han, 2002). Once the associated schemas are activated they may be accompanied by autobiographical memories and overwhelming emotional responses, thereby maintaining harmful interpersonal patterns (Briere, 2002).

There is some evidence that adult survivors demonstrate differences in relational schematic features in comparison to their non-maltreated peers. For example, one study assessed the schemas of three groups of women, one group without a history of child sexual abuse, a second group with a history of child sexual abuse, and a third group who had experienced both child sexual abuse and adult sexual victimization [revictimized] (Cloitre, Cohen, & Scarvalone, 2002). In the study, participants completed a questionnaire where they had to imagine themselves exhibiting certain interpersonal behaviors with significant others and then anticipate how the others would respond. The researchers sought to examine *schema content* (e.g., positive or negative valence) and *schema range*—similar to the notions of accessibility and availability. The study also compared one's generalized expectations of parents to current relationships.

As attachment theory would suggest, the two groups that experienced child maltreatment expected significantly more negative responses and significantly fewer positive responses from parents. The findings also suggested that women who were revictimized possessed interpersonal schemas that were rigidly applied such that expectations for current relationships were similar to their parental relationships. Unexpectedly, women who were only abused in childhood, but not revictimized, did not extend predominant expectations of their parents to the expectations of current significant relationships, which is contradictory to the attachment theoretical assumption that individuals tend to repeat their history through automatic application of relationship schemas. The researchers concluded that the maltreatment group that was not revictimized in adulthood may have come from families with less parental control or neglect which may have provided them with opportunities to seek out and establish healthier, alternative relationships (Scarvalone, Fox, & Safran, 2005). Also, on a more optimistic note, in general, all groups rated interactions with their friends more positively than those of their parents, showing that

victimization in childhood does not completely impede the ability to form positive adulthood relationships.

Although Cloitre and colleagues' study highlights important differential schema characteristics between maltreatment survivors and non-maltreated individuals, there are some limitations, especially as they relate to information processing and emotion regulation. For example, although the valence of interpersonal expectations was assessed, the non-experimental approach did not consider how activated schemas influenced the participants' emotional experiences while completing the study and how this may have colored their responses. An extension of this study could include information processing designs showing that once schemas are activated they can influence the subsequent flow of experience, including cognition, affect, and behavior (Banse, 1999). Such an extension could shed light on how relational schemata operate in "real-time" emotion regulation processes.

Social Support Effects on Adjustment

In addition to examining the pathways from maltreated child to maladjusted adult survivor, some investigators have considered the developmental trajectories associated with resilience. In a review of the literature, Briere and Elliott (1994) stated that "as many as one-fourth of all sexually abused children are either asymptomatic immediately following abuse or asymptomatic within two years of their abuse." One study found that 22% of adult survivors displayed typical adjustment across multiple indicators of well-being (McGloin & Spatz-Widom, 2001).

Although there are many factors that promote resiliency, the present study focused specifically on the effects of social support, which is defined broadly as those social interactions or relationships that provide actual assistance or a feeling of connectedness to a person or group

that is perceived as caring or loving (Hobfoll and Stephens, 1990). The social support literature is vast and there are diverse topical reviews within this content area. The current study is concerned with thoughts about supportive others—a concept most closely linked to the perceived social support concept. Perceived social support is an expectation about supportive behaviors that would be given during times of need (Norris and Kaniasty, 1996). Some theorists view perceived social support as a reflection of a broad mental representation of relationships (Ptacek, 1996; Collins & Feeney, 2004). Persons who have secure attachment relationships are likely to view themselves as worthy of care and that others will provide support in times of need. This perspective was adopted for the present study such that perceived social support is viewed as a specific type of relational schema—referred to hereafter as support schema.

The relationship between social support and adult survivor adjustment has appeared equivocal. When considering social supports' function as a moderator, high perceived support in adulthood has demonstrated inverse relationships with the magnitude of depressive symptoms (Powers, Ressler, and Bradley, 2009), broad internalizing symptoms (McLewin & Muller, 2006), and posttraumatic stress symptoms (Schumm, Briggs-Phillips, & Hobfoll, 2006). In addition, when considering social supports' function as a mediator, child maltreatment can have a deleterious effect on support schema, which in turn predicts diminished adjustment (Runtz and Schallow, 1997; Punamaki, Kompore, Qouta, El-Masri, & de Jong, 2005). Taken together, these findings indicate that adult survivors are likely to have dubious beliefs about social support and subsequently adjust poorly, yet those adult survivors who have sure beliefs in support are likely to be resilient. Cautious interpretation is warranted, however, when making inferences about these non-experimental, cross-sectional studies. As alluded to previously, such studies simply imply co-occurrence of social support and adjustment phenomena and have limited ability to

imply the temporal cause→effect order. Specifically, without an experimental design, one cannot infer whether social support influences poor adjustment or poor adjustment diminishes one's certainty regarding support availability. Therefore, the present study will make up for this limitation by using a randomized-controlled design to examine the effects of social support in the lives of adult survivors.

Supportive Relationships, Physiological Reactivity, and Physical Health Quality

Addressing the importance of social support for adult survivors reaches beyond social and emotional adjustment, per se. Indeed, social supports' effects on emotional adjustment also implicate physical health quality. Cross-sectional and longitudinal studies have revealed associations between being an adult survivor and physical health quality (Romans, Belaise, Morris & Raffi, 2002; Springer, Sheridan, Kuo, & Carnes, 2003; Martsolf, Bureke-Draucker, & Chapman, 2004; Marks & Greenfield, 2009). In a nationally representative sample of 8,000 women, this association remained significant over and beyond the effects of socio-demographics and adulthood revictimization (Thompson, Arias, Basile, & Desai, 2002). Not only do adult survivors report more acute and chronic physical health problems, they also express more intense physical symptoms and utilize healthcare systems more often than adults without such histories (Hulme, 2000). Since these problems have been found in college, community, military, and treatment-seeking samples, they appear generalizable to adult survivors en masse (Runtz, 2002; Jonzon & Lindblad, 2005; Lang et al., 2006; Cloitre, Cohen, Edelman, & Han, 2001).

The physical health problems associated with child maltreatment vary in nature and there are undoubtedly complex interrelationships between psychosocial factors and biological systems accounting for these associations. Psychosomatic medicine and the stress and health literature implicate exaggerated reactivity of those biological systems involved in stress responsiveness as

viable underlying mechanism, namely the autonomic nervous system [ANS] (Uchino, 2006). Reactivity is defined as the magnitude of change in stress-related physiological response from a resting baseline to a discrete stimulus or task (Manuck, 1994; Sherwood & Turner, 1992). Herein child maltreatment is conceptualized as a stressor that promotes exaggerated and chronic reactivity across the lifespan that subsequently influences physical health quality. Indeed, researchers have found that adult survivors are more likely to evidence exaggerated ANS reactivity in comparison to adults without such histories (Heim, et al., 2000). Exaggerated and chronic reactivity have influences on physical health in several ways, namely through the depletion and overuse of important bodily resources. For example, chronic activation of the stress response and its associated physiological systems has been associated with increased coronary complications, decreased immune system efficiency, and increased susceptibility to disease pathogens (Uchino, 2006). The present paper specifically examines heart rate and heart rate variability as windows into stress-response physiology [reactivity].

Supportive relationships have evidenced ability to "buffer" the negative influences of stress-response physiology (Cohen & Wills, 1985). Lepore (1998) refers to this phenomenon as the social support-reactivity hypothesis asserting that supportive others enhance health prospects by preventing or attenuating harmful physiological responses to stressors, such as excessive or prolonged cardiovascular responses. Several studies have been conducted to examine this hypothesis and have shown mixed, yet convincing findings (for a review, see Lepore, 1998).

Supportive Relationships Influence Cognition: Stress Appraisal

A key limitation of adult survivor research has been the lack of a coherent explication and testing of social support processes. That is, many of the correlational designs have not outlined, and subsequently tested, how social support influences the psychosocial adjustment and physical

health quality of adult survivors. One way in which social support achieves its influences on reactivity is through cognition. Particularly, social support appears to change one's perception of a stressor [stress-appraisal], which subsequently influences how one approaches the stressor and changes reactivity (Sandler, Wolchik, Mackinnon, Ayers, & Roosa, 1997; Lakey & Cohen, 2000). When an individual encounters a given situation which could be deemed as stressful (e.g., a screaming work supervisor), he or she will consider the degree of threat associated with that situation (Lazarus & Folkman, 1984). There are two different stages of appraisal: primary and secondary. During primary appraisal, an individual asks him or herself, "Do I feel *intimidated* or *challenged* by this situation?" Then, during secondary appraisal, the individual asks him or herself, "Do I have the resources, agency, or *control* to combat this challenge?" The answers to these questions inherently imply individual differences in the experience of stress. Feeling increasingly intimidated and challenged and less in control should lead to more experiential stress. Moreover, this continued pattern is believed to have long-term implications for physical health quality (see Figure 4, Lakey & Cohen, 2000; Uchino, 2009). Some researchers have indicated that stress and reactivity studies have failed to outline the differences between primary versus secondary stress appraisal (Lepore, 1998). Therefore, the present study makes up for this limitation by assessing subjective perceptions of being intimidated, challenged, and feeling in control.

Hypothetically then, the support schema priming paradigm could work by way of attention and appraisal processes operating reciprocally. For example, during support schema activation, attention may become focused on positive episodic memories and autobiographical knowledge related to attachment and security which leads to an overall reduced stress appraisal for encountered stressors. Social-cognitive theorists have suggested that when individuals can

focus their attention on mentally activated relational information, they can override their automatic responses to a given situation and adjust for the influence of the activated schema (Peirce, Baldwin, & Lydon, 1997). If the stressor must be endured and processed, it may be reappraised or interpreted vis-à-vis the positive information which is also active in working memory.

Supportiveness is Circumscribed by Interpersonal Relationship Problems

Not all individuals, though, benefit from "support." Smith, Ruiz, and Uchino (2004) asserted that some individuals, because of their past tumultuous interpersonal histories, might interpret current relationships more negatively and expect little support in the future. These investigators go on to suggest that the quality of one's relationships is an important moderator of cardiovascular reactivity during stress (Birmingham et al., 2009). In one study, they speculated that trait hostile individuals, who are perceived to have more conflict in social relations, would possess schemas characterized by less positive supportive ties (Smith, Ruiz, & Uchino, 2004). To test this notion, they manipulated social support schema activation through a structured exercise where high versus low hostile participants wrote and thought about either a supportive person in their lives or a casual acquaintance. Subsequently, the participants were presented with an anxiety-inducing speech stressor task in which their emotional experiences and physiological responses were assessed. Consistent with the stress-buffering model, activation of supportive relationship schemas attenuated physiological reactivity to the stressor. Importantly, though, support produced a significant decrease in state anger among low hostile, but not high hostile, participants. Their study highlighted the potentially important role of relationship quality, at least as it relates to trait hostility, for buffering stress.

In a cross-cultural replication study with Chinese participants, the same methodology was used except, in contrast to the speech stressor, the mood induction involved recalling an interpersonal anger experience (Ratnasingam & Bishop, 2007). In addition, the differential effect of trait anger rather than hostility was examined. Again, compared to individuals in the control condition, individuals in the support condition showed lower physiological reactivity as well as smaller increases in state anger. Furthermore, for the support condition, there were no differences found between the high versus low anger groups, which suggested that all individuals benefited from the support schema activation regardless of personality.

These findings support the assumption that the mere activation of social support schemas can attenuate negative emotional reactivity. Moreover, the study by Smith and colleagues (2004) showed that the interpersonal dynamics associated with certain personality characteristics can abate social support's stress-buffering effects. Similar findings have been discussed in received social support literature, whereby the alleviation of negative affect depends largely on personality aspects of the recipient (Lakey, Adams, Neely, Rhodes, Lutz, & Sielky, 2002; Reynolds, & Perrin, 2004; Cohen, Lakey, Tiell, & Neely, 2005).

The methodology of these studies also tap an aspect of social support not examined in cross-sectional, non-experimental studies. Specifically, the experimental manipulation of social support facilitated analysis of short-term cognitive-affective dynamics. This method provides inferential confidence about the causes of attenuated negative affect. Non-experimental research, on the other hand, may be reflective of longer-term consequences of social support, such as buffering over-time (Gross & John, 2003). More simply, non-experimental studies may not assess the moment-by-moment regulatory processes associated with social support.

Among adult survivors, if relationship quality is important in buffering stress, then negative features of social relationships should result in differential social support effectiveness. Particularly, the survivors with high interpersonal problems are likely those that find themselves in negative emotional encounters that adversely influence supportive relations and weaken social bonds (Cloitre, Koenen, Cohen, and Han, 2002). This notion is consistent with findings indicating an inverse relationship between social support and social conflict (Abbey, Abramis, & Caplan, 1985). Certainly, negative interpersonal interactions, especially problems with the support network, are likely to undermine the conditions conducive for perceived supportiveness, such as companionship, intimacy, and low conflict (Major, Zubek, Cooper, Cozzarelli, & Richards, 1997; Lakey and Cohen, 2000).

II. The Present Study

Rationale

The long-term social and emotional consequences of maltreatment remains understudied. The integration of attachment theory, social-cognitive theory, emotion theories, and emotion regulation concepts provide a cogent foundation for studying the social and emotional dynamics experienced by adult survivors. The current study was motivated by the assumption that early atypical caregiver-child relationships are likely to provide the child with an interpersonal relationship knowledge base that subsequently generates interpersonal problems across the life-course. This illustrates one pathway of effects that may carry over from maltreated child to adult survivor.

In addition, interpersonal problems restrict the effectiveness of support schemas' stress-buffering ability (Gross, 2002; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). The relationship between emotional functioning and social functioning is believed to be reciprocal, such that

successful emotion regulation is imperative for the maintenance of healthy interpersonal relationships (Halberstadt, Denham, & Dunsmore, 2001). Emotions are believed to serve as regulators of interpersonal processes and are also regulated by interpersonal processes (Cole, Martin, & Dennis, 2004). In all, support schemas, interpersonal functioning, and emotional functioning are constructs that mutually influence one other.

Few studies have empirically examined the dynamics of social and emotional functioning in the lives of adult survivors. Those in extant literature have relied greatly on non-experimental designs, which may not capture the moment-by-moment processes as they unfold under experimental conditions. Furthermore, the quantity of experimental studies involving child victims, whose problems reflect the short-term effects of maltreatment, far exceed those that have assessed adult survivors, whose problems reflect the long-term effects of maltreatment. The proposed study examined the relationship between interpersonal problems and emotional reactivity in the lives of adult survivors. In addition, support schemata were considered key mechanisms that effectively modulate negatively-valenced emotional reactivity in adult survivors. The support schema effect is believed to be mediated by stress appraisal processes such that, when stressors are encountered, schema activation decreases feelings of intimidation and challenge and increases feeling in control. Additionally, this study examined if the beneficial effects of mental activation of support schemas is more evident among survivors with low versus high interpersonal difficulties. This finding extends current knowledge of how social-cognitive processes operate under different conditions thereby highlighting key targets for intervention and prevention.

For several reasons, anger was used as the emotional context for examining support schema effects. Importantly, adult survivors have been shown to evidence problems with anger

modulation (van der Kolk, et al., 1996). Also, anger is an emotion that frequently arises in everyday life that influences social functioning and, at times, must be controlled (Maus, Cook, & Gross, 2007). In order to minimize confounds due to the influence of impression management, limited introspective insight, and memory biases, a standardized laboratory harassment task was used.

In addition to self-report measures of emotional reactivity in response to harassment, the current study also incorporated the use of physiological indices, particularly heart rate (HR) and heart rate variability (HRV). The use of multiple indices of reactivity is important to address because studies have sometimes shown differential outcomes of laboratory stressors when relying on self-report alone versus in conjunction with psychophysiological indicators (Ratnasingam & Bishop, 2007). Also, psychophysiological responses are correlated with physical health outcomes.

Hypotheses

H-1: Main effect: Interpersonal problems are associated with more emotional reactivity. In particular, individuals who have high interpersonal problems experience more reactivity in response to interpersonal laboratory stressors.

H-2: Moderation effect: The relationship between interpersonal problems and emotional reactivity is moderated by support schema activation, such that support effectiveness is most evident for individuals with low interpersonal problems. In other words, there will be a significant interpersonal problem by schema activation (support versus control) interaction effect for negatively-valenced emotional (e.g., state anger) and cardiovascular reactivity.

H-3: Mediation effect: Stress appraisals mediate the relationship between schema activation and emotional reactivity. In other words, when stress appraisal is statistically accounted for, a previously significant relationship between schema activation and emotional reactivity will diminish or disappear.

Potential confounds

There are several factors that could confound the effects of interest; however, for sake of a parsimonious model, only a few were considered for this study: affect intensity, maltreatment severity, maltreatment disclosure, and maltreatment intervention. Affect intensity represents individual differences in the strength of both positive and negative emotional experiences (Larsen, 1984). The objective of the proposed study was to assess whether support schema activation could attenuate emotional reactivity, thus the role of individual differences in emotional responding was beyond the study's scope. Indeed, as mentioned previously, several studies have already shown that adult survivors have more difficulty with negative affect, in general, in comparison to their non-maltreated peers.

Several studies have noted the contribution of maltreatment severity to variability in adult survivor adjustment. For example, the nature (e.g., intercourse or penetration) and frequency of abuse acts is correlated with trauma symptoms in adulthood (Jonzon & Linblad, 2005). For this reason, some researchers have resorted to "weighting" the severity of maltreatment acts thereby indicating that not all maltreatment acts are equivalent (Zink, Klesges, Stevens &, Decker, 2009).

The act of disclosing maltreatment experiences has garnered increasing attention for its role in adult survivor functioning. In comparison to abuse characteristics (e.g., severity), disclosure characteristics may have more contributions to adult survivor psychological and psychosomatic symptoms (Jonzon & Lindblad, 2005). There is also research evidence for a

significant relationship between high social support and disclosure, particularly when the disclosure experiences are positive (Jonzon & Lindblad, 2004). Therefore, the present study controlled for the effect of disclosure versus non-disclosure on the relationships of interest.

Moreover, helping professions would hope and, intuitively, one would assume that receiving some form of intervention for maltreatment experiences would contribute to adult survivor functioning. Surprisingly, to the present researcher's knowledge, most studies with adult survivors do not examine treatment history. Therefore, the present study controlled for the effect of intervention history.

Method

Subjects

All participants were female undergraduate students enrolled in psychology courses at a large southeastern land-grant university. The women ranged in age from 18 to 29 (mean =19, standard deviation=1.28). The screening phase included 1,249 participants. Of this sample, almost half (597; 47.8%) met at least one of the basic eligibility criteria: positive endorsement of any child sexual abuse act; and/ or any child physical abuse act; and/ or pervasive child neglect (see below). Of the 597 screening phase participants who were laboratory phase eligible, 126 (21%) agreed to participate in the laboratory phase. There were no statistically significant differences between participants who did or did not choose to participate in the laboratory phase. As shown in Table 1, those individuals who were eligible and did not participate versus laboratory phase subjects were similar in age (M= 19 versus M= 19, respectively), $t(594)$= -1.50, p= .13, interpersonal problems (M= 1.76 versus M= 1.76, respectively), $t(595)$= -.31, p= .76, affect intensity (M= 3.57 versus M= 3.60, respectively), $t(595)$= -.63, p= .53, degree of child sexual abuse severity, Mann-Whitney U(583) = 27750.00, Z = -0.56, p= 0.58, degree of child physical

abuse severity, Mann-Whitney U(583) = 27489.00, Z = -0.49, p= 0.62, degree of child neglect severity, U(590) = 28178.50, Z = -0.43, p= 0.67, endorsement of child sexual abuse survivors (Cramer's V=.03, p=.45), child physical abuse survivors (Cramer's V=.01, p=.87), and pervasive child neglect survivors (Cramer's V=.03, p=.45), ethnicity/ race (Cramer's V=.07, p=.57), marital status (Cramer's V=.05, p=.72), and social class (Cramer's V=.05, p=.96).

Among the 126 women who were subjects in the laboratory phase, only data from 119 were used for analyses (i.e., 7 were removed because of heart rate outliers; see Results section). As shown in Table 2, the majority of the subjects for the laboratory phase were European-American (83.2%) and single/never-married (77.3%), and almost half were from middle class families (44.5%). All screening phase participants received extra credit toward psychology courses, and laboratory phase subjects received extra credit toward psychology courses and $10.00 payment.

In regard to maltreatment subtypes, there was an aim to recruit equally proportionate adult survivors who had experienced child sexual abuse, child physical abuse, and child neglect (see Table 3). An examination of maltreatment subtype effects would have been beyond the scope of this study. In contrast, the focus was to examine outcomes of the maltreating caregiver-child relationship. In fact, most studies examining differential effects between maltreatment subtypes have found that more variance in adverse outcomes is explained by other characteristics of the abuse that act as moderating variables (e.g., frequency of maltreatment, relationship to perpetrator, type of sexual activity, etc.), rather than by maltreatment subtype, per se (Arata, Langhinrichsen-Rohling, Bowers, & Farrill-Swails, 2005).

Only female subjects were chosen for the present study because gender is a variable that could result in differential outcomes. For example, women generally display a proclivity to befriend others or form alliances with larger social groups during times of stress, whereas men

tend to display a fight-or-flight response (Taylor et al., 2000). Furthermore, socio-cultural factors may influence anger-related emotion regulatory goals given that, at least in Westernized societies, anger expression is seen as more inappropriate for women than men (Mauss, Cook, & Gross, 2007). For these reasons, focusing on one gender reduces error variance for the outcomes of interest in this study.

Outlier analysis was performed to examine influential data points. Subjects with baseline heart rates greater than or equal to two standard deviations above the grand mean were considered outliers and not included in the main analyses. Based on this criterion, 7 subjects were removed and 119 subjects composed the final sample (see Table 2). As reported in the findings below, this sample size had sufficient statistical power to detect significant effects.

Being a victim of any act of caregiver-inflicted child sexual abuse or child physical abuse or pervasive child neglect were the key inclusion criterion for the laboratory phase of the study. Ineligible individuals were those women younger than 18 years of age, men, and women who reported drug or alcohol dependence, or significantly compromised health or immune-system status (e.g., HIV infection). See Tables 3 and 4 for the frequency and co-occurrence of maltreatment subtypes.

Measures

Socio-demographics (Appendix A). Subjects were asked questions regarding their background, including age, ethnicity/ race, marital status, and family's social class. Tables 1 and 2 display these socio-demographics for the present sample.

Child abuse. A modified version of the Child Abuse Survey (CAS; Appendix B), adapted from Esposito and Clum (2002), was used to screen both child sexual abuse and child physical abuse. Based on Finkelhor's (1979) criteria, *child sexual abuse* was defined as sexual

experiences that occurred ≤ age 14 when the perpetrator was ≥ 5 years older than the child. The current study uses a conservative definition by focusing only on caregiver perpetrated abuse, consistent with the attachment perspective that forms the theoretical basis of this study. For both child sexual abuse and child physical abuse, subjects were asked to indicate their relationship to the perpetrator: father or adoptive father, stepfather, grandfather, other live-in male relative, foster father, unrelated live-in male, mother or adoptive mother, stepmother, grandmother, other live-in female relative, foster mother, unrelated live-in female, babysitter, or sibling. Subjects were also able to indicate whether they resided in an institution. [1] An individual's positive endorsement of any item on the CAS was sufficient for laboratory phase eligibility.

Subjects were asked to indicate the nature of sexual abuse experiences inflicted by a caregiver that the subject experienced prior to the age of 14. These items were rank ordered by severity weights: (1) kissing and hugging in a sexual way; (2) touching body parts (except for sex organs) in a sexual way; (3) touching sex organs in a sexual way; (4) inserting sex organs in one's mouth; (5) having sexual intercourse; (6) having anal intercourse; and, receiving threats of harm. Of note, since there was ambiguity of implied severity, the last item was not assigned a weight. *Child physical abuse* was recorded if the subject indicated having received caregiver-inflicted hand strikes (e.g., punching), object strikes (e.g., hit with belt), kicking, stabbing, thrown down, or other physical assault which resulted in physical marks, breaks to skin, bruises, or injury that warranted medical treatment (regardless of whether it was received) prior to the age of 14. The frequency of each child sexual abuse and child physical abuse item (14 items) was recorded according to the following scale: 0 = never true, 1 = rarely true, 2 = sometimes true, 3 = often true, and 4 = very often true.

Severity indices for child physical abuse and child sexual abuse, respectively, were created with the CAS items. When calculating severity indices, the items [receiving threats of harm] as a form of coercion for sex acts and [other physical assault] were not included since the items' implied severity was ambiguous. The severity index score for child sexual abuse was the product of the frequency with which a respective event occurred by the respective event's severity weight, which was subsequently summed across items. For child physical abuse, the severity index score was equivalent to the frequency with which each event occurred summed across items.

Maltreatment interventions (Appendix D). A single question asked about interventions received following each maltreatment subtype (child sexual abuse, child physical abuse, and child neglect). Subjects were allowed to select as many as applicable of the following: counseling, support from family, support from friends, medical care, legal system intervention (e.g., police, courts, etc.), government agency intervention (e.g., social services), other intervention (open-ended), and did not receive intervention(s).

Maltreatment disclosures (Appendix E). For each maltreatment subtype, subjects were asked to report who they told about the maltreatment. Subjects were allowed to select as many as applicable of the following: parent or guardian, teacher, other adult family member (e.g., aunt or uncle), child family member (e.g., sibling or cousin), peer or friend, government agency (e.g., social services or police department), clergy (e.g., pastor or priest), healthcare professional (e.g., doctor or therapist/counselor), other (open-ended), and did not disclose.

Child neglect. The Multidimensional Neglectful Behavior Scale Form A: Adolescent and Adult-Recall Version (MNBS; Straus, Kinard, & Williams, 1995; Appendix C) is an 8-item questionnaire used to assess adult recall of child neglect among five dimensions, *physical needs*

(i.e., food, clothing, shelter, and medical care), *emotional needs* (i.e., affection, companionship, and support), *supervision needs* (i.e., limit setting, attending to misbehavior, knowing child's whereabouts and friends), and *cognitive needs* (i.e., being played with or read to and assisting with school homework). Respondents were asked whether their parents failed to perform a series of behaviors using the following scale: 1 = once, 2 = twice, 3 = 3-5 times, 4 = 6-10 times, 5 = 11-20 times, 6 = More than 20 times, and 0 = never. The MNBS has shown good reliability and validity using USA samples and cross-culturally (Straus, 2006).

In comparison to child sexual abuse and child physical abuse, scientists have noted the ambiguity of operationalizing child neglect (Straus & Kaufman-Kantor, 2005). For example, one sexual abuse act or physical abuse act would deem a perpetrator as "abusive," whereas one neglectful act (e.g., not helping with homework) may not deem a perpetrator as "neglectful." Therefore, the MNBS is more useful for observing the pervasiveness of neglect (Straus, 2006). A pervasive pattern of neglect is probable when three or more neglectful acts on the MNBS are endorsed by a subject, and this cutoff was used to determine eligibility for the current study.

Affect intensity. The Affect Intensity Measure (AIM; Larsen, 1984; Appendix F) is a self-report 40-item questionnaire which asks subjects how frequently they experience emotions of particular intensities in certain situations. Respondents answer on a six point scale ranging from "never" to "always" for positive and negative emotions. The AIM includes items such as "When I accomplish something difficult, I feel delighted or elated" and "The sight of someone who is hurt badly affects me strongly." This scale was designed to measure the intensity of an emotion unconfounded with the emotion's frequency of occurrence. To obtain the affect intensity total score, items are summed and then averaged, with higher scores reflecting increased affect intensity.

The AIM appears to measure a particularly stable individual difference characteristic. The test-retest reliabilities for the AIM total score are high: .80, .81, and .81 at 1, 2, and 3-month intervals respectively (Larsen, 1984). Moreover, the correlation between AIM scores assessed two years apart is .75 (Larsen & Diener, 1987). Finally, the convergent validity of the AIM has been demonstrated with the finding that parental reports of their offspring's AIM total score correlated .50 with the offspring's self-reported AIM total score (Larsen & Diener, 1987).

For the current study, the AIM total score demonstrated good reliability (Cronbach alpha=.89) and scores ranged from 2 to 5 (mean = 3.79, standard deviation = .54). For inferential statistics, the current sample scores met the normality assumption.

Interpersonal difficulties. The original Inventory of Interpersonal Problems (IIP; Horowitz, Rosenberg, Baer, Ureno, & Villasenor, 1988; Appendix G) is a 127-item questionnaire that examines difficulties with interpersonal functioning. Pilkonis, Kim, Proietti, & Barkham (1996) factor analyzed scores from the original IIP version collected from individuals diagnosed with DSM-III-R (American Psychiatric Association, 1987) personality disorders and individuals without personality disorders with intentions of creating a brief, screener questionnaire to use in initial stages of personality disorders assessment. The analyses showed that 28 items demonstrated the ability to discriminate individuals with personality disorders from individuals without personality disorders and reflected difficulties with interpersonal sensitivity, interpersonal ambivalence, and aggression. Scarpa and colleagues (1999) were able to demonstrate good test-retest reliability, internal consistency, factorial validity, convergent validity, and external validity for the modified IIP in a non-clinical college sample.

The IIP items are presented to the respondent in two general forms: inhibitions ('It is hard for me to [do something]') and excesses ('I [do something] too much'). For example, items are

presented such as “I am too aggressive toward other people” or “I am too afraid of other people.” Respondents answer each of the interpersonal problems on a five point scale ranging from “not at all” to “extremely distressing.” Items on the modified IIP are summed to obtain the overall interpersonal problems score, with higher scores reflecting increased difficulty with interpersonal relatedness.. For the current study, the IIP demonstrated good reliability (Cronbach alpha=.94) and scores ranged from 34 to 104 (mean = 59.51, standard deviation = 14.43). For inferential statistics, the current sample scores met the normality assumption after log transformation.

Mood change. Subjects rated their experiential anger, sadness, anxiety, guilt, shame, worry, fear, nervousness, happiness, joy, amusement, and pleasure via a single-item per emotion on a Mood Questionnaire (adapted from Mauss, Cook, & Gross, 2007; Appendix I). These ratings were made after the baseline, schema priming, and harassment epochs using 11-point Likert-type scales, ranging from 0 (none) to 10 (extremely). Each item began with the stem ‘I feel’. Although the main analyses explored experiential anger, supplemental analyses also explored the other emotional experiences as possible outcomes. For example, in addition to feeling angry after the harassment tasks, some individuals may have also felt ashamed that they could not perform that task efficiently.

Stress appraisal. Several key terms were selected from the early works of Lazarus and colleagues (1984) to capture the stress appraisal construct. In order to assess primary appraisal, subjects answered whether they felt *challenged* or *intimidated* using 11-point Likert-type scales, ranging from 0 (none) to 10 (extremely). Additionally, in order to assess secondary appraisals, subjects answered whether they felt in *control*. The control variable was reverse scored such that higher scores reflect feeling less in control. Appraisals were assessed following the harassment epoch.

Cardiovascular reactivity. Indices of the cardiac cycle have been widely used in stress and health studies as markers of autonomic nervous system activity (for a complete review see Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Several of these studies have found significant correlations between heart rate and anger such that state anger produces the greatest heart rate reactivity compared to other emotions (Schwartz, Weinberger, & Singer, 1981). Heart rate and heart rate variability were used as objective indicators of emotional reactivity, particularly autonomic nervous system reflections of state anger. As stated previously, the use of multiple converging measures are important in cognition and emotion studies, because reliance on self-report alone can increase Type II error.

Heart rate is a measure of cardiac rhythmic movements expressed in beats-per-minute and is jointly determined by the sympathetic and parasympathetic branches of the autonomic nervous system. Sympathetic activation increases heart rate, whereas parasympathetic activation decreases heart rate. The inclusion of heart rate variability facilitates separating the sympathetic versus parasympathetic contributions to emotional experiences (Bernston et al., 1997). Heart rate variability refers to the beat-to-beat alterations in heart rate and has been used as an indicator of parasympathetic activity (Mauss et al., 2007). Reduced heart rate variability (parasympathetic withdrawal) has been shown in relation to several negative emotional states, particularly anger provocations in cognition and emotion studies (Marci, Glick, Loh, & Dougherty, 2007). The root mean square of successive differences (rMSSD) is a time domain measure of heart rate variability used for the current study. This index may be less sensitive to variations in respiratory patterns than other methods of heart rate variability analysis (e.g., spectral methods) (Berntson, Lozano, & Chen, 2005; Task Force of the European Society for Cardiology and the North

American Society of Pacing and Electrophysiology [Task Force], 1996). The rMSSD reflects variability in time between heartbeats.

Cardiac activity was monitored and collected using the Polar Heart Rate Monitor model S810i (Polar CIC, USA). The model S810i is capable of providing waveform differences between successive cardiac cycles. This monitor is considered a valid measure of heart rate and heart rate variability during stationary laboratory tasks and provides results comparable to the electrocardiogram (Goodie, Larkin, & Schauss, 2000; Gamelin, Berthoin, & Bosquet, 2006; Vanderlei et al., 2008; Nunan, et al., 2008; Gamelin, Berthoin, & Bosquet, 2008). The monitor uses a combined sensor and transmitter that is worn across the torso with an elastic band. Electrodes embedded in the sensor/transmitter detect cardiac electrical impulses. The detection of these signals is transmitted to the receiver that calculates the inter-beat interval (IBI) in milliseconds between these signals. The receiver is worn on the wrist and resembles are wristwatch.

For this study, the IBI data were transferred from the receiver device to an IBM-compatible computer using the Polar Precision Performance software (version 4.03.04, Polar CIC, USA) via infrared communication. Subsequently, the IBI data were analyzed with Kubios HRV software (version 2.0; Biosignal Analysis and Medical Imaging Group, Department of Physics, University of Kuopio, Kuopio, Finland), which converts the IBI data into time domains for heart rate (in beats per minute) and heart rate variability (rMSSD in milliseconds). The Kubios HRV software can be used for data reduction, artifact control, and computation of average physiological activity for each subject. The Kubios software also facilitates separating the entire IBI time series into sections for analyses. In the present case, the time series was sectioned into epochs for

"baseline," "schema priming," and "harassment," which allowed assessing change in cardiac activity across important stages of the laboratory phase.

Health screening. Subjects were administered a Medical Screening Questionnaire (MSQ; Appendix K) that assessed health factors beyond the interest of the study that could have influenced reactivity findings, such as neurological disorders, cardiovascular problems, certain prescription and over-the-counter medications, fasting, quantity of caffeine consumed, lack of sleep, amount of physical exercise, and use of tobacco products.

Procedure

For the screening phase, subjects completed an Informed Consent Form (Appendix N), Demographics Questionnaire, CAS-Modified, MNBS-Modified, Maltreatment Interventions, Maltreatment Disclosures, AIM, and IIP-Modified via the Internet using a password protected, university-hosted website. Permissions were obtained for all copyrighted instruments, namely the MNBS.

Eligible women from the screening phase were contacted through email to continue in the study's laboratory phase. Upon arrival to the laboratory, subjects were greeted by a female research assistant who briefly described the study's purpose and procedures (see Appendix L). Screening phase subjects who chose to participate in the laboratory phase completed another Informed Consent Form (Appendix O) and the MSQ. Of note, subjects were not asked to refrain from possible confounding effects like exercising, caffeine use, eating, or smoking immediately prior to the lab session. These factors were, however, examined for their influences on the main relationships of interest (described below).

After completion of the Informed Consent and MSQ, the research assistant demonstrated wearing of the Polar monitor and allowed the subjects to don the monitor in private, after which

cardiovascular activity was continuously measured. [The procedures described from this point forward are a modification of those used by Mauss, Cook, and Gross (2007).] Then, the female research assistant stated that she would wait behind a two-way mirror with an "experimenter" and that experimenter-to-subject communication would take place through an intercom system. The communication with the experimenter was actually a pre-made recording of a male voice, but the subject was led to believe it was a present person.

Vanilla baseline epoch. The subject then watched a 3-minute emotionally neutral film-clip. This step is used to induce a relatively neutral mood across subjects and establish baseline cardiovascular activation, which is called a "vanilla baseline condition" (see Jennings, Kamarck, Stewart, Eddy, & Johnson, 1992). The neutral video is a video segment of *Powaqqatsi: Life in Transformation* by Godfrey Reggio (co-produced by Francis Ford Coppola and George Lucas). *Powaqqatsi* is a multicultural documentary portraying daily life events in various countries. There are no words in the film, and the scenes come from all over the world. Once the video was over, the intercom transmitted an audio recording of a male voice instructing the subject to rate their present emotional experience using the Mood Questionnaire.

Schema priming epoch. After subjects completed the baseline Mood Questionnaire, the audio recording of the experimenter informed the subject that she would participate in two cognitive tasks, one linguistic and one mathematic, and that communication would continue to take place through an intercom system. Subjects assigned to the 'support' schema condition were asked to think for 2 minutes and then write for 5 minutes about a close, supportive other, whereas subjects assigned to the 'acquaintance' condition were asked to think and then write about a casual acquaintance. Once subjects completed the schema priming, they rated their present emotional

experience using the Mood Questionnaire. Schema priming lasted a total of 7 minutes duration (*Appendix H*).

Harassment epoch. After schema priming, the harassment began. Subjects were asked to count backwards quickly in increments of 7 or 13 from a large number (e.g. count backwards in steps of 7 from 18,652). There were a total 7 counting trials which were each 60 seconds long. Between each trial, a pre-recorded male "experimenter" voice asked subjects for their results (e.g., What number are you at?). In addition, the male voice had a "grouchy" tone (e.g., deep sighing, flat inflection) and gave subjects finicky feedback, such as "count faster," "refrain from fidgeting," "speak louder," and "articulate better." Once subjects completed the harassment task, they rated their present emotional experience using the Mood Questionnaire.

Debriefing. After the harassment, the research assistant returned to the subject and instructed her to remove the Polar monitor in private. Then the research assistant administered a funnel debriefing (Appendix I) following procedures outlined by Bargh, & Chartrand (2000). Funnel debriefing is thus named because one starts with the most abstract and open-ended questions and then funnels down to the most specific and closed-ended questions. The funnel debriefing in the present case was used to assess the extent to which subjects perceived the true nature of the linguistic task (schema priming) and the mathematics task (harassment). Subjects were also asked if they believed their performance on one task influenced their performance on other tasks. Then subjects were given a full debriefing regarding the true nature of the experiment.

IV. Results

The results are presented in several sections. In the first portion, the data preparation and basic tests of the internal validity (e.g., selection bias) of the study are reported. In the subsequent sections, tests of the primary hypotheses are reported, namely the main effect,

moderation effect, and mediation effect. Then, there is an investigation of confounding, namely the influence of affect intensity, maltreatment severity, maltreatment intervention, and maltreatment disclosure.

Data preparation: screening and cleaning

Using the Kubios HRV software (see Method section), the IBI time series was sectioned to capture the beginning and ending of the baseline, schema activation, and harassment epochs. In order to ensure that the intended experiential state had been reached for each epoch, only the last minute of cardiac data from each epoch were used for analysis. This procedure also ensured within-subject equivalence in cardiac data points across epochs.

In the case of missing data, the interpersonal problems and affect intensity scales were pro-rated in order to calculate values for missing data points, which were then used to calculate total scores. In general, the distributions of most continuous independent and dependent variables were normal as indicated by P-P plots and normality tests provided by the Statistical Package for Social Sciences version 11.50 software (SPSS, Inc.). The distribution of interpersonal problem scores, however, was positively skewed, suggesting fewer high scorers in this particular sample of abuse survivors. This skewness was corrected with a log transformation. For the main analyses, schema activation was dummy coded as 0 = acquaintance schema and 1 = support schema. The product of the interpersonal problems and dummy variable was used as the interaction term in the moderator analyses.

Manipulation Check

Paired *t*-tests were performed to assess whether the harassment task was effective in inducing anger relative to the vanilla baseline. Indeed, in comparison to baseline, the harassment resulted in significantly increased state anger (baseline M= .39 versus harassment M= 3.03),

t(118)= 11.15, *p*< .001, increased heart rate (baseline *M*= 80.80 versus harassment *M*= 92.56 bpm), *t*(118)= 12.89, *p*< .001, and decreased rMSSD (baseline *M*= 45.17 versus harassment *M*= 33.15), *t*(118)= -7.34, *p*< .001. Furthermore, qualitative information obtained from the subjects during the funnel debriefing supported the quantitative findings.[2]

Paired *t*-tests were also performed to assess whether stress appraisals for the sample changed from baseline to harassment. Indeed, in comparison to baseline, the harassment resulted in subjects reporting they were significantly more challenged (baseline *M*= 1.36 versus harassment *M*= 5.46), *t*(113)= -14.23, *p*< .001, more intimidated (baseline *M*= 1.01 versus harassment *M*= 3.48), *t*(117)= -10.19, *p*< .001, and less in control (baseline *M*= 5.32 versus harassment *M*= 6.64), *t*(118)= -4.90, *p*< .001.

A qualitative review of the schema writing samples was performed. In comparison to the control group, participants in the support schema group generally used words (e.g., loving, nurturing, supportive), indicative of supportive relationships. Thus, it appears that subjects followed their respective writing prompts.

Randomization check

Independent samples *t*-tests and Levene's tests were performed to assess equivalence and homogeneity of variance between schema conditions before manipulation. In particular, as shown in Table 5, at baseline the support schema group and acquaintance schema group did not significantly differ on any of the variables of interest, including interpersonal problems, *t*(117)= -.59, *p*= .56, affect intensity, *t*(117)= .001, *p*= .99, state anger, *t*(117)= .39, *p*= .70, heart rate, t(117)= 1.90, *p*=.06, rMSSD, t(117)= -.68, *p*= .50, feeling challenged, t(115)= 1.13, *p*= .26, intimidated, t(116)= .65, *p*= .52, and in control, t(117)= .12, *p*= .39. Furthermore, the Levene'

test was not significant for any of the variables, which indicates homescedasticity between groups.

Reactivity

In order to assess reactivity, changes in state anger, heart rate, and rMSSD, and stress appraisals (i.e., challenged, intimidated, and control) were calculated by subtracting their respective baseline scores from their respective harassment scores, such that positive scores reflect increases after harassment. The means and standard deviations for baseline and harassment are shown in Table 5. Although there are different methods for assessing change (Willett, 1989), change scores were used because of their ease of use with regression (described below). Evidence suggests that change scores are as stable and valid as reactivity scores obtained by more complex methods (Llabre et al., 1991).

Hypotheses 1 and 2: main and moderation effects

Linear regression analysis was performed whereby the state anger change score was regressed on the interpersonal problems variable, schema activation dummy variable, and schema activation by interpersonal problems interaction variable. Linear regression analysis was chosen because of its ease of use with both dichotomous and continuous predictors. The interpersonal problems scores were grand-mean centered and used as a continuous variable.

Based on the moderation approach outlined by Baron and Kenny (1986) and Aiken and West (1991), the schema activation variable was entered in the first block, the interpersonal problems variable was entered in the second block, and the schema activation by interpersonal problems interaction variable was entered in the third block (see Table 7). The overall model used to estimate the direct and interaction parameters was significant, $F(3, 118)= 4.45$, $p< 0.01$; $R^2\Delta= .03$, $p< .05$. As predicted, there was a significant main effect for interpersonal problems

(β= .35, p< 0.01), such that increases in interpersonal problems predicted increases in state anger. There was a significant main effect for schema activation (β= -.22, p<.05), such that there was less magnitude of increase in state anger for the support schema (M= 2.13) versus acquaintance schema (M= 3.16). In addition, as predicted, there was a significant schema activation by interpersonal problems interaction, (β= -.24, p= .05), which indicated that the simple slopes representing the association between interpersonal problems and state anger change score differed by schema activation condition.

As outlined by Holmbeck (2002), the interaction effects were explored with post-hoc probes. Specifically, two separate post hoc regressions were conducted that involved the creation of two conditional group variables. Then the products of the conditional moderator variables and interpersonal problems were derived, thus resulting in two interaction terms: interpersonal problems by support schema and interpersonal problems by acquaintance schema. Subsequently, two simultaneous regression analyses were conducted such that state anger change was regressed on the interpersonal problems variable, the conditional group variables, and their relevant interaction variables.

Consistent with the a priori hypothesis, individuals with low interpersonal problems benefitted from the support schema activation by showing little increase in state anger regardless of group (see Figure 1). Unexpectedly, individuals with high interpersonal problems also benefitted from the support schema activation, in that the relationship between interpersonal problems and state anger change was not significant for those in the support schema group (unstandardized b= -0.112; $t(115)$=-.03, p=97). Moreover, the lack of significance here indicates that individuals with support schema activation benefitted whether they had high or low interpersonal problems. On the other hand, the magnitude of increased state anger after

harassment was most pronounced for individuals with high interpersonal problems in the acquaintance schema group (unstandardized b=8.852; $t(115)$=2.87, p<.01). As such, support schema activation seemed to have the most benefit for reducing the magnitude of state anger reactivity in individuals with high interpersonal problems.

The cardiovascular activity did not clearly parallel the experiential self-report. Specifically, the regression model for heart rate, $F(3, 118)= 1.12$, $p= .34$, $R^2\Delta= .01$, $p= .46$, was not significant. Therefore, moderation analyses were not conducted for heart rate. The model parameters for rMSSD, however, did suggest a linear trend, $F(3, 118)= 1.94$, $p= .13$, $R^2\Delta=.04$, $p<.05$. When examined further, the main effects for schema activation and interpersonal problems were not significant; however, there was a significant schema activation by interpersonal problems interaction, ($\beta= .26$, $p<.05$), which indicated that the simple slopes representing the association between schema activation and rMSSD change differed by degree of interpersonal problems.

For post hoc probes, the same procedures outlined before were followed, but included rMSSD as the outcome variable. As shown in Figure 2, the relationship between schema activation and rMSSD change differed in direction depending upon interpersonal problems, such that greater reactivity (i.e., decrease in rMSSD) was observed for individuals in the support schema condition with high interpersonal problems, but less reactivity (i.e., less of a decrease in rMSSD) was observed for those in the support schema condition with high interpersonal problems (unstandardized b= 55.04; $t(115)$=2.35, $p<.05$). On the other hand, the relationship between interpersonal problems and rMSSD change was not significant for those in the acquaintance schema activation condition. As such, support schema activation seemed to be most effective in reducing vagal withdrawal for individuals with high interpersonal problems.

Hypothesis 3: mediation effect

Of note, neither feelings of control nor the cardiovascular measures met the prerequisites for mediation. In particular, as shown in Table 6, state anger change was not related to control. Likewise, the cardiovascular measures were related to neither schema activation nor stress appraisal (e.g., control, challenged, intimidated).

Baron and Kenny's (1986) outline for estimating indirect (mediational) effects was used, which involved a series of regression analyses. First, reports of feeling challenged and intimidated, respectively, were regressed on schema activation. Second, state anger change was regressed on schema activation. Third, state anger change was regressed on schema activation and challenged and intimidated scores, respectively. The significant association between schema activation and state anger change disappeared when the scores for feeling challenged and intimidated, respectively, were included in the regression equation (see Figure 5). This finding suggested full mediation. As recommended by Baron and Kenny (1986) and Mackinnon and Dwyer (1993), Sobel's test (1982) was used to determine if the reduction in the prediction was statistically significant. MacKinnon and colleagues (2002), in their comparison of 14 methods of assessing mediation effects, settled on Sobel's test as superior in terms of power and intuitive appeal. Scores for challenge, $z' = -1.95$, SE= .16, p=.05, and intimidation, = $z' = -2.05$, SE=.18, p= .04, both mediated the effect between schema activation and state anger change. Moreover, reports of feeling challenged and intimidated accounted for 26% of the variation in state anger reactivity.

Since the mediation model was tested using concurrent measurement of stress appraisals (predictors) and reactivity (outcome), there could be alternative explanations for the significant relationships between these two factors. Therefore, alternative models were examined.

Specifically, the same steps outlined above were carried out, except the third step such that challenged and intimidated, respectively, were regressed on schema activation and state anger change. Unexpectedly, the relationship between the significant association between schema activation and the stress appraisals variables (challenged and intimidated) disappeared when state anger change was included in the regression equation. This finding calls into question the hypothesized theoretical direction of relationships and suggests alternative explanations (see Stress Appraisals, Support Schema, and Reactivity section in Discussion).

Possible confounds

Affect intensity was initially included in the design as an extraneous variable that may influence the statistical relationships of interest. Since affect intensity was not significantly correlated with the dependent variable, state anger change, $r(119) = .11$, $p = .23$, it was not further considered as a possible confound and therefore not statistically controlled in subsequent analyses.

Maltreatment severity, maltreatment disclosure, and maltreatment intervention were entered as covariates in secondary analyses to assess for their influence on the overall moderation model. The model that included maltreatment severity, maltreatment disclosure, maltreatment intervention (all comprising block one), schema activation (comprising block two), interpersonal problems (comprising block three), and the schema activation by interpersonal problems interaction (comprising block four), emerged as significant, $F(12, 118) = 2.95$, $p < .001$, $R^2 = .25$. In the overall model, several of the variables were not significant predictors of state anger reactivity, namely child neglect severity, child physical abuse severity, child sexual abuse intervention, child physical abuse disclosure, child physical abuse intervention, and childhood neglect disclosure. In contrast, child sexual abuse severity, child sexual abuse disclosure, and

child neglect intervention did emerge as significant predictors of state anger reactivity. Most importantly, the effects of schema activation, interpersonal problems, and the schema activation by interpersonal problems interaction remained significant predictors of state anger reactivity over and beyond the influence of the covariates.

As with the main analyses rMSSD showed a somewhat different pattern. The identical procedures followed for state anger reactivity were performed for rMSSD reactivity. The overall model was not significant but did show a trend, $F(12, 118)= 1.77$, $p= .06$, $R^2= .18$. Several of the variables were not significant predictors of rMSSD reactivity, namely child neglect severity, child physical abuse severity, child sexual abuse severity, child sexual abuse disclosure, child physical abuse disclosure, child physical abuse intervention, child neglect intervention, schema activation, and interpersonal problems. In contrast, child sexual abuse intervention and child neglect disclosure did emerge as significant predictors of rMSSD reactivity. There was a trend toward significance for the schema activation by interpersonal problems interaction; the inclusion of covariates decreased the significance of this effect.

Health screening and funnel debriefing

In secondary analyses, the MSQ items were examined for their possible influences on the relationships in question. In regard to medications, some women reported taking oral contraceptives (24%), antidepressants (6%), psychostimulants (2%), and other psychotropics (2%). In regard to medical conditions, some women endoresed asthma (4%), high or low blood pressure (2%), heart conditions (2%), and dizzy spells (5%). In addition, several other variables were assessed such as number of hours slept, physical exercise, caffeine consumptions, tobacco product use, hearing problems, and learning disorders. All of these variables were entered as

covariates in the main moderation and mediation regression. Notably, the inclusion of these variables did not change the direction or significance among any relationships of interest.

In order to examine demand characteristics, the debriefing item that asked subjects if they had suspicion that the schema priming (linguistic task) was supposed to influence the harassment (mathematics task) was examined. Eighteen percent of the respondents endorsed that they did have suspicion. Entering this item in the main moderation and mediation regressions did not change the direction or significance of any relationships of interest.

Other Mood States

Since the harassment task may have resulted in change in a variety of other mood states, they were each examined in moderation and mediation analyses similar to state anger reactivity and rMSSD reactivity. The emotions examined included anger, sad, anxiety, guilty, ashamed, worried, afraid, nervous, happy, joy, amused, and pleased.

The only significant findings that emerged were state afraid reactivity and state joy reactivity. Specifically, the overall model used to estimate the direct and interaction parameters for state afraid was significant, $F(3, 116)= 7.31$, $p< 0.0001$; $R^2\Delta= .005$, $p= .43$. There was a significant main effect for schema activation ($\beta= -.22$, $p<.01$), such that there was less magnitude of increase in state afraid for the support schema ($M= 0.38$) versus acquaintance schema ($M= 1.00$). There was also a significant main effect for interpersonal problems ($\beta= .41$, $p< 0.001$), such that increases in interpersonal problems predicted increases in state afraid. In contrast to state anger, however, there was not a significant schema activation by interpersonal problems interaction, ($\beta= -.09$, $p= .43$).

The overall model used to estimate the direct and interaction parameters for state joy was significant, $F(3, 112)= 3.36$, $p< 0.05$; $R^2\Delta= .03$, $p< .05$. In contrast to state anger and state

afraid, there was not a significant main effect for schema activation (β=.10, p=.30). There was also no significant main effect for interpersonal problems (β= .04, p=.76). Similar to rMSSD, however, there was a significant schema activation by interpersonal problems interaction, (β= .24, p= .05). Similar post-hoc probing procedures used for state anger reactivity were used for state joy reactivity. As shown in Figure 3, the relationship between interpersonal problems and state joy reactivity differed significantly by experimental group such that the decrease in joy for those in the support condition was significant (unstandardized b= 8.48; $t(109)$=2.94, $p<.01$), whereas there was no significant relationship between interpersonal problems and state joy change for the control condition (unstandardized b= .81; $t(109)$=.30, $p=.76$).

V. Discussion

This study was designed to examine the ability of support schemas to mitigate emotional reactivity for adult survivors, especially while concurrently considering the interpersonal problems that many survivors endure. Indeed, the present evidence supports the support schema→reactivity effect, which worked best for individuals with substantial interpersonal problems. The study also showed that stress appraisals, particularly feeling challenged and intimidated, mediated the relationship between support schemas and emotional reactivity. The relationships between these factors were not changed when accounting for maltreatment severity, maltreatment disclosure, or maltreatment interventions.

These findings replicate studies demonstrating that support schemas function as buffers that attenuate reactivity associated with the stress response (Lepore, 1998; Smith, Ruiz, & Uchino 2004; Ratnasingam & Bishop, 2007). This study also extended previous research designs to a randomized, controlled laboratory experiment distinctively involving adult women survivors of child maltreatment.

In contrast to extant literature, maltreatment severity, specifically child neglect severity and child physical abuse severity did not emerge as significant predictors of emotional reactivity. This could have resulted from a range restriction. Indeed, all of the maltreatment severity variables were positively skewed, thereby indicating that the present sample experienced less severe forms of maltreatment.

In addition, following the interpersonal stressor, interpersonal problems was not related to stress appraisals. This could have also resulted from a range restriction. In particular, the interpersonal problem scores were initially positively skewed, yet this was correctable through log transformation. If more individuals with considerable interpersonal problems had participated in the laboratory phase of the study, perhaps a more pronounced effect on stress appraisals would have been observed.

Support Schema, Interpersonal Problems, and Emotional Reactivity

Viewing interpersonal factors as influential in the support schema→reactivity relationship has both intuitive appeal and empirical support (Smith, Ruiz, & Uchino, 2004); however, the present findings, in conjunction with similar studies, would suggest refinement of these assumptions. Contrary to predictions, high interpersonal problems did not impede support schema effects on state anger reactivity (see Figure 1). That is, support schemas were able to abate the subjective effects of stress vis-à-vis interpersonal problems that would appear to maintain social conflict and thwart support (Birmingham et al., 2009). This particular finding is not consonant with the study by Smith and colleagues (2004) who found that the activation of support schema reduced state anger reactivity among low but not high-hostile women.

Besides childhood maltreatment histories, there are important commonalities and differences between the Smith et al. (2004) study and the present one. For example, both studies

primed for support schemas in similar ways. In contrast, though, the studies varied by the nature of interpersonal factors investigated and the way these factors were used methodologically. Specifically, the present study examined interpersonal problems, whereas the Smith et al. study examined hostility. Interpersonal problems are characterized by chronically frustrated interpersonal goals or interpersonal motives for one or both members of a dyad (Horowitz, 2008; Horowitz et al., 1988). As mentioned previously, they are also viewed as markers for personality disorders. Hostility, on the other hand, is a specific personality trait characterized by negative beliefs about and attitudes toward others, including cynicism, mistrust, and denigration (Miller, Smith, Turner, Guijarro, & Hallet 1996). Individuals high in this trait are more likely to respond to interpersonal stress with anger. Although, interpersonal problems are likely experienced by individual high in hostility, interpersonal problems are also likely experienced by individuals high in other personality traits, such as extreme shyness or neuroticism (Nysæter, Langvik, Berthelsen, Nordvik, & 2009). Altogether, the study's differences in general versus specific interpersonal constructs may vary in importance for support schema.

Moreover, when considering methodological differences, Smith and colleagues (2004) used subjects from the extreme quartiles of a hostility distribution, whereas the present study used individuals from the entire distribution of interpersonal problems, which is similar to the method used by Ratnasingam and Bishop (2007). As in the present study, Ratnasingam and Bishop (2007) also found that the support schema effect did not significantly vary between high trait anger and low trait anger individuals. Therefore, the differences between methods lead to different inferences that can be drawn about the gradations of a given personality predisposition and its effects on the support schema and reactivity relationship.

Although use of support schemata was helpful in general, the subjects with high interpersonal problems may have benefited the most from support schema activation. Specifically, as alluded to previously, social cognitivists have moved beyond the attachment theory view of a predominant internal working model by asserting that people can have various sources of interpersonal knowledge. Surely, positively as well as negatively-valenced knowledge may be readily available in memory. Those people who experience substantial interpersonal problems, however, may have considerable negative interpersonal encounters to recall, and they may access this knowledge often—chronic accessibility. Since interpersonal conflict is often coupled with negative emotions, individuals with high interpersonal problems may benefit most from a support intervention to abate emotional reactivity.

Support Schema, Interpersonal Problems, and Cardiovascular Reactivity

In comparison to the self-report data, the physiological data were less clear and less robust than anticipated. Although the present study's stressor produced heart rate change from baseline to task, there was no support schema main effect and no schema activation by interpersonal problems moderation effect on heart rate reactivity. These findings contrast with the social support→ reactivity studies after which the present study was modeled. In those studies the outcome variable of choice has been cardiovascular measures, particularly heart rate and blood pressure (for a review, see Lepore, 1998). In Lepore's (1998) review, he discusses mixed findings between several of these studies. For example, he noted that support effects are most pronounced under high stress. In the present study, perhaps the stress was not substantial enough to result in support stress-buffering of heart-rate reactivity.

Heart rate variability yielded a most interesting finding. There were neither significant main effects for support schema nor interpersonal problems; however, there was a significant

support schema by interpersonal problems interaction. Investigating the simple slopes of the interaction suggested that individuals who received support and had high interpersonal problems experienced the least parasympathetic withdrawal, relative to the acquaintance condition. Stated differently, support schema activation allowed individuals with high interpersonal problems to have less of a decrease in heart rate variability. This resonates with the previous explanation asserting that individuals with high interpersonal problems may have benefited the most from support schema activation. This result is also consistent with the state anger findings in that individuals with high interpersonal problems showed less anger reactivity in the support condition, relative to the acquaintance condition. Moreover, the correlation between rMSSD and state anger reactivity (-.55), suggests that increases in state anger were related to more of a decrease in heart rate variability.

The present pattern of heart rate and heart rate variability outcomes suggests that support schemata are most influential on parasympathetic (vagal) versus sympathetic components of autonomic reactivity. In Lepore's review of social support→reactivity studies, there were virtually no studies that examined markers of heart rate variability. Uchino and colleagues (1996) in their review of studies examining the relationship between social support and physiological process indicate that parasympathetic influences have largely been overlooked in the social support literature.

Stress Appraisals, Support Schema, and Reactivity

Altogether, from baseline to laboratory stressor, the subjects experienced changes in stress appraisals—more challenged, more intimidated, and less in control. Those individuals primed for support schema, however, experienced less change in their experiences of being challenged and intimidated. This difference highlights the ability of social support to protect

individuals against the adverse effects of stressors by leading them to interpret situations less negatively (Lakey & Cohen, 2000).

The stress appraisal findings do not clearly correspond with existing social support→reactivity studies which have concurrently examined stress appraisals. Specifically, Gerin, Pieper, Levy, & Pickering (1992) and Lepore (1993) found significant relationships between social support and attenuated reactivity, yet they did not find social support effects on self-reported stress [appraisal]. Ratnasingam and Bishop (2007) also found significant relationships between support schema activation and attenuated reactivity and reduced negative appraisal; however, appraisal did not mediate the support schema effect. There are a couple of plausible reasons for the lack of correspondence between these studies and the present one, namely the way in which stress appraisals were assessed. In one study, after stressor administration, subjects completed a questionnaire concerning the "stressfulness" of the stressor (Gerin et al., 1992). In another study, after stressor administration, subjects completed a biploar adjective scale (stressed-relaxed; uncomfortable-comfortable, etc.) about the stress they experienced during the task (Lepore, 1993). A third study required respondents to answer a question about the stress associated with a recalled anger-related event (Ratnasignam & Bishop, 2007). In comparison to the studies mentioned, the present study refrained from asking respondents about the stressor, per se, yet subjects were asked to make an evaluation about the self. Also, the present study used key words that are often referenced in the stress and coping literature, such as challenged, intimidated (threatened), and control (Lakey & Cohen, 2000). Taken together, the method variance could have contributed to the discrepancies between studies. Indeed, the theoretical idea of stress appraisal has left open varying interpretations for operationalization, hence it has been referred to as a "noisy" construct (Monroe & Kelley, 1997).

In the present study, factors most closely linked to primary appraisal versus secondary appraisal emerged as mediators of the support schema-reactivity relationship. This would suggest that activated support schemas had their most significant influence on individual's perception of threat versus their perception of personal agency. Indeed, supplementary analyses suggested that support schema activation resulted in individuals feeling less afraid. Taken together, one could suppose that support schemas provide the "felt security" and feeling of being cared for that is needed to navigate stressful situations. This resonates with the adage "perfect love expels all fear." Similar ideas are found in the attachment literature considering the idea of a secure base, which suggests that children will actively approach their environments when they feel secure and less threatened. Overall, this finding highlights the significance of cognition in the support schema and reactivity relationship.

The plausibility of an alternative model was also tested such that the positioning of stress appraisal and reactivity were rearranged in the causal chain. Perhaps support schemata influence emotional reactivity and emotional reactivity subsequently influences stress appraisal. This alternative model was also empirically supported. This finding suggests reciprocal causation between stress appraisal and emotional reactivity. If one views stress appraisal as a process through which "meaning" is derived, surely an emotional state can also produce meaning. Across the stream of experience, appraisals and emotions changing and mutually influencing one another.

Limitations and Future Directions

Social-cognitive researchers who have theorized about and/ or investigated relational schema have noted the limitations of existing methodologies concerning this construct (Baldwin, 1992; Banse, 1999; Pierce, Baldwin, & Lydon, 1997). Similar to other theoretical constructs,

relational schemas cannot be observed directly, which is the most obvious limitation. One can, however, employ various methods to build empirical support. Bargh and Chartrand (2000) suggest a wide variety of methods (e.g., subliminal and surpraliminal priming, interference tasks, etc.) to support the general view that such knowledge structures influence cognition, emotion, and behavior (Smith et al., 2004). Thus, while the current study did use priming to aid in schema activation, an extension of the present study could include additional dependent measures related to support schema activation, such as response latencies, efficiency versus error-proneness, and goal-directed behavior (support-seeking).

The present study was conducted with students attending a major university full-time, so the findings may not generalize to adult survivors beyond this context. These support schema effects may differ for other survivors. For example, beneficial knowledge about support relationships may be less cognitively available and accessible in clinical populations in that they may engage in behaviors that ward off potential sources of support. In comparison to the present sample, individuals with clinical difficulties related to interpersonal and emotional maladjustment (e.g., borderline personality disorder) may have responded differently to the support schema manipulation and the harassment task. For example, the harassment, an interpersonal stressor, may have resulted in exaggerated emotional and physiological reactivity. Therefore, an extension of the present design could involve either controlling for or directly examining the importance of clinical syndromes.

Another limitation was the study's exclusive focus on women. As stated previously, women were chosen for the present study because gender is a variable that could result in differential outcomes. For example, women generally display a proclivity to befriend others or form alliances with larger social groups during times of stress, in comparison to men, who tend

to display a fight-or-flight response (Taylor et al., 2000). For these reasons, one gender was investigated to reduce error variance for the variables of interest in this study. These same reasons for excluding men in the present case could conversely provide rationale for examining gender effects more closely. Indeed, examination of differential outcomes would highlight the conditions under which the support schema effect works best. For example, Smith and colleagues (2004) found that the support schema→reactivity relationship varied among low and high hostile women, yet this was not so for men.

Furthermore, Lepore (1998), in his review of the support-reactivity connection, has noted the conditions under which the stress-buffering is most evident. One of these conditions deals with the potency of the stressor. In the present case, a more potent stressor could have produced differential stress-buffering for cardiovascular reactivity in particular and more change in perceptions of control.

Beyond the writing method used in the current study, there are additional ways to activate support schemas in one's naturalistic environment, such as carrying around a keepsake from or photograph of a supportive other, frequenting environments reminiscent of supportive others (e.g., favorite restaurant), and creating arts and crafts for supportive others. All of these ideas can be transferred into simple interventions that are easily implemented.

Implications for Research and Practice

This present study implies several areas of importance. The study extends knowledge about emotional and emotional regulation functioning in the lives of adult survivors. For example, cross-sectional studies that have examined the buffering effects of social support on emotional maladjustment are limited in their ability to confidently assert direction of causality, such as an inverse correlation between social support and anger. Examining the momentary

emotion changes following an experimental manipulation involving random assignment provides credence to an assertion about the causes for these changes. One can infer with confidence that support schemas have the regulatory capacity to assuage anger.

Moreover, the regulatory influence of support schemas is effective even when considering interpersonal stressors (harassment). This is particularly important for individuals who experience considerable interpersonal conflict and may have a substantial store of negatively-valenced social knowledge. As stated previously, survivors with high interpersonal problems appeared to benefit most from the support manipulation. For these individuals, interventionists should promote factors that produce healthy relationship functioning and yield a store of positive support knowledge. Likewise, interventionists should encourage individuals with high interpersonal problems to access their knowledge structures during times of stress.

The present study also suggests that researchers who investigate the phenomenon of child maltreatment and its effects should go beyond methodology which focuses on predominant internal working models. Indeed the present findings show that even individuals with high interpersonal problems can access support schemas when they are primed for them. This is particularly important for cognitive scientists and interventionists. In this way, the present study implies that individuals demonstrating high interpersonal problems should identify and think about at least one person that they can rely on during times of stress. This is in contrast to intervention programs that may emphasize increasing social network size.

Perceived social support appears to be most emphasized in research designs that activate support schemas. Indeed, received social support involves a transaction between dyad members that could introduce complexity into the social support process. For example, support recipients may dislike the “supportive behaviors” that support providers give. Of note, the present study

focuses specifically on the perception of supportive others and their associated positive attributes and behaviors. In this way, subjects were allowed to choose and focus on the most liked attributes of supportive individuals.

In regard to translational science, the present study may have implications for naturalistic stressors that adult survivors encounter. As stated previously, support schema could serve as worthwhile targets for efficacious interventions, either as the intervention focal point or as an augmentation to empirically supported treatments (Chambless & Ollendick, 2001). In this way, interventionist could focus attention on helping adult survivors decrease social conflict and increase positive social interactions that engender positive support schemas.

Conclusion

The present study has drawn attention to significant problems faced by many adult survivors: interpersonal problems and the experience of negatively-valenced emotions. Certainly, this study has shown that support schemata are factors that help to ameliorate these difficulties. In addition, support schemas have positive parasympathetic influences and maintain joy. Moreover, if adult survives can summon positive knowledge about at least one person in their lives who provides support, the reactivity that leads to mental and physical health difficulties can be hindered.

VI. References

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VI. Footnotes

[1] During the study, one participant noted that the structure of the Child Abuse Survey, maltreatment interventions question, and maltreatment disclosures question did not allow participants to answer for multiple perpetrators. In addition, the Child Abuse Survey does not facilitate identifying mutually exclusive maltreatment events. For example, one sexual abuse event could have included kissing and penetration.

[2] Subjects' experience of anger associated with the task is illustrated by the following statements recorded during the funneled debriefing: "I'm pissed off." "The experiment was annoying." "The voice over the intercom was frustrating." "The experimenter was mean, strict..." "That guy was trying to be a jerk on purpose." "He's really mean." "I did not like him [experimenter]." "He was obnoxious."

Appendix A

DEMOGRAPHICS QUESTIONNAIRE

Name:_____

Phone: _____

Email: _____

1. What is your age? _____ years

2. A. Which of the following best describes your ethnicity/ race?
   1) ___African-American
   2) ___Caucasian
   3) ___Hispanic
   4) ___Asian
   5) ___Other

3. Marital Status:
   1) ____Married
   2) ____Long-term relationship
   3) ____Divorced or Separated
   4) ____Single or Never married
   5) ____Widowed

4. Which of the following best describes the majority of people who live within comfortable walking distance of the place where **you are originally from**?
   1) ____ Wealthy
   2) ____ Upper middle class/professionals
   3) ____ Middle Class
   4) ____ Lower Middle Class
   5) ____ Blue-collar/White-collar working class
   6) ____ Poor, working class
   7) ____ Poor, unemployed

5. What is your approximate yearly household income or, if dorm resident, parents income?
   1) ____ $10,000
   2) ____ $10,000- $25, 000
   3) ____ $25,000 - $50000
   4) ____ $50,000 - $75,000
   5) ____ > $75,000

Appendix B

CHILD ABUSE SURVEY (Modified)

Directions: Please use the scale below to answer the following two sets of questions as they apply to your experiences ***prior to 14 years of age***.

0 = never true
1 = rarely true
2 = sometimes true
3 = often true
4 = very often true

A. When I was growing up, this happened to me *by a caregiver* (that is, a babysitter, parent, step-parent, grandparent, sibling, etc. who was responsible for you at the time and at least 5 years older)…

01._____I was kissed and/or hugged in a sexual way.
02._____Someone touched parts of my body, except for my sex organs, in a sexual way.
03._____Someone touched my sex organs in a sexual way.
04._____Someone put my sex organs in his/her mouth.
05._____Someone had sexual intercourse with me.
06._____Someone had anal intercourse with me.
07._____Someone threatened to hurt me or tell lies about me unless I did something sexual with him/her.

If you answered 1 through 4 for any item in part A, which of the following individuals were you answering about?

1 = Father or adoptive father
2 = Step father
3 = Grandfather
4 = Other male relative I lived with
5 = Foster father
6 = Unrelated man I lived with
7 = Mother or adoptive mother
8 = Step mother
9 = Grandmother
10 = Other female relative I lived with
11 = Foster mother
12 = Unrelated woman I lived with
13 = I lived in an institution and will answer for that place
14 = Babysitter
15= Sibling

NOTE: For Section B, only mark those events that resulted in physical marks, breaks in the skin, bruises, or injury that required medical treatment, even if it was not received. Also, only include events that occurred *by a caregiver* (that is, a babysitter, parent, step-parent, grandparent, sibling, etc. who was responsible for you at the time.)

B. When I was growing up…

01._____Someone hit me really hard.
02._____Someone kicked me.

03._____Someone punched me.
04._____Someone threw me down.
05._____Someone stabbed me.
06._____Someone punished me with a belt or other hard object.
07._____I was the victim of some other physical act.

If you answered 1 through 4 for any item in part B, which of the following individuals were you answering about?

1 = Father or adoptive father
2 = Step father
3 = Grandfather
4 = Other male relative I lived with
5 = Foster father
6 = Unrelated man I lived with
7 = Mother or adoptive mother
8 = Step mother
9 = Grandmother
10 = Other female relative I lived with
11 = Foster mother
12 = Unrelated woman I lived with
13 = I lived in an institution and will answer for that place
14 = Babysitter
15= Sibling

Appendix C

MULTIDIMENSIONAL NEGLECTFUL BEHAVIOR SCALE (Modified)

Directions: These questions are about what it was like when you were living with your parents ***prior to 14 years of age***. "Parents" refer to the person or people who raised you. If you lived with different parents at different times, or if there is a question that applies only to part of the time when you were growing up, you should answer for the parent or the part of the time that you think had the most influence on you.

For which of the following "father figures" will you answer the questions? (Circle only one category number.):

1 = Father or adoptive father
2 = Step father
3 = Grandfather
4 = Other male relative I lived with
5 = Foster father
6 = Unrelated man I lived with
7 = There was no male who was responsible for me
8 = I lived in an institution and will answer for that place

For which of the following "mother figures" will you answer the questions? (Circle only one category.):

1 = Mother or adoptive mother
2 = Step mother
3 = Grandmother
4 = Other female relative I lived with
5 = Foster mother
6 = Unrelated woman I lived with
7 = There was no woman who was responsible for me
8 = I lived in an institution and will answer for that place

Bringing up children is difficult. Many parents do not do some things for their children that they should do. For example, a parent might not take an interest in how well the child is doing in school, or they might leave the child alone when it is dangerous to do that. Please use the scale below to answer the following questions as they apply to your experiences ***prior to 14 years of age***. Please answer the questions about things your parents did or did not do when you were that age

For each of the following things that parents might do or not do, please the answer number that comes closest to how many times it happened when you ***prior to 14 years of age****.*

1 = Once
2 = Twice
3 = 3-5 times
4 = 6-10 times
5 = 11-20 times
6 = More than 20 times
0 = This has never happened

01._____ My parents helped me with homework if I needed help.
02._____ My parents did not help me to do my best in school.
03._____ My parents did not care if I did things like shoplifting.
04._____ My parents did not care if I got into trouble in school.
05._____ My parents helped me when I had problems.
06._____ My parents did not comfort me when I was upset.
07._____ My parents gave me enough clothes to keep me warm.
08._____ My parents did not keep me clean.

Appendix D

MALTREATMENT INTERVENTIONS

What type(s) of interventions did you receive after the experience(s) you indicated? (check all that apply)

- ❑ Counseling
- ❑ Support from family
- ❑ Support from friends
- ❑ Medical care
- ❑ Legal system intervention (e.g., police, courts, etc.)
- ❑ Government agency (e.g., social services)
- ❑ Other (please specify) _____
- ❑ None
- ❑ N/A

Appendix E

MALTREATMENT DISCLOSURES

Please indicate all the persons who you reported or talked to regarding the experience(s) you indicated. (check all that apply)

- ❑ Parent or guardian
- ❑ Teacher
- ❑ Other adult family member (e.g., aunt, uncle)
- ❑ Child family member (e.g., sibling or cousin)
- ❑ Peer or friend
- ❑ Government agency (e.g., social services, police department)
- ❑ Clergy (e.g., pastor or priest)
- ❑ Healthcare professional (e.g., doctor or therapist/counselor)
- ❑ Did not report or disclose to anyone
- ❑ Other
- ❑ N/A

Appendix F

AFFECT INTENSITY MEASURE

Directions: Indicate how you typically respond to the following events by using the scale:

1 = I never feel like that
2 = I almost never feel like that
3 = I occasionally feel like that
4 = I usually feel like that
5 = I almost always feel like that
6 = I always feel like that

01._____When I accomplish something difficult I feel delighted or elated.
02._____When I feel happy it is a strong type of exuberance.
03._____I enjoy being with other people.
04._____I feel pretty bad when I tell a lie.
05._____When I solve a small personal problem, I feel euphoric.
06._____My emotions tend to be more intense than those of most people.
07._____My happy moods are so strong that I feel like I'm in heaven.
08._____I get overly enthusiastic.
09._____If I complete a task I thought was impossible, I am ecstatic.
10._____My heart races at the anticipation of some exciting event.
11._____Sad movies deeply touch me.
12._____When I'm happy it's a feeling of being untroubled and content rather than being zestful and aroused.
13._____When I talk in front of a group for the first time my voice gets shaky and my heart races.
14._____When something good happens, I am usually much more jubilant than others.
15._____My friends might say I'm emotional.
16._____The memories I like most are of those times when I felt content and peaceful rather than zestful and enthusiastic.
17._____The sight of someone who is hurt badly affects me strongly.
18._____When I'm feeling well it's easy for me to go from being in a good mood to being really joyful.
19._____"Calm and cool" could easily describe me.
20._____When I'm happy I feel like I'm bursting with joy.
21._____Seeing a picture of some violent car accident in a newspaper makes me feel sick to my stomach.
22._____When I'm happy I feel very energetic.
23._____When I receive an award I become overjoyed.
24._____When I succeed at something, my reaction is calm contentment.
25._____When I do something wrong I have strong feelings of shame and guilt.
26._____I can remain calm even on the most trying days.
27._____When things are going good I feel "on top of the world."
28._____When I get angry it's easy for me to still be rational and not overreact.

29._____When I know I have done something very well, I feel relaxed and content rather than excited and elated.
30._____When I do feel anxiety it is normally very strong.
31._____My negative moods are mild in intensity.
32._____When I am excited over something I want to share my feelings with everyone.
33._____When I feel happiness it's a quiet type of contentment.
34._____My friends would probably say I'm a tense or "high-strung" person.
35._____When I'm happy I bubble over with energy.
36._____When I feel guilty this emotion is quite strong.
37._____I would characterize my happy moods as closer to contentment than to joy.
38._____When someone compliments me, I get so happy I could "burst."
39._____When I am nervous I get shaky all over.
40._____When I am happy the feeling is more like contentment and inner calm than one of exhilaration and excitement.

Appendix G

INVENTORY OF INTERPERSONAL PROBLEMS (Modified)

Directions: Here is a list of problems that people report in relating to other people. Please read the list below, and for each item, consider whether that problem has been a problem for you with respect to any significant person in your life. Indicate your answer in the space provided.

1 = Not at all
2 = A little bit
3 = Moderately
4 = Quite a bit
5 = Extremely

Part I. The following are things you find hard to do with other people.

It is hard for me to…
01._____trust other people.
02._____say "no" to other people.
03._____join in groups.
04._____introduce myself to new people.
05._____be assertive with another person.
06._____do what another person wants me to do.
07._____get along with people who have authority over me.
08._____make reasonable demands of other people.
09._____socialize with other people.
10._____feel comfortable around other people.
11._____express my feelings to other people directly.
12._____be supportive of another person's goals in life.
13._____really care about other people's problems.
14._____maintain a working relationship with someone I don't like.
15._____set goals for myself without other people's advice.
16._____accept another person's authority over me.
17._____ignore criticism from other people.
18._____feel like a separate person when I am in a relationship.
19._____put somebody else's needs before my own.
20._____take instructions from other people who have authority over me.
21._____feel good about another person's happiness.
22._____get over the feeling of loss after a relationship has ended.
23._____ask other people to get together socially with me.
24._____be assertive without worrying about hurting the other person's feelings.
25._____be self-confident when I am with other people.

Part II. The following are things that you do too much.
26._____I fight with other people too much.
27._____I am too sensitive to criticism.

28._____I get irritated or annoyed too easily.
29._____I am too sensitive to rejection.
30._____I am too aggressive toward other people.
31._____I try to please other people too much.
32._____I feel attacked by other people too much.
33._____I criticize other people too much.
34._____I am affected by another person's moods too much.
35._____I am too afraid of other people.
36._____I worry too much about other people's reactions to me.
37._____I am influenced too much by another person's thoughts and feelings.
38._____I worry too much about disappointing other people.
39._____I lose my temper too easily.
40._____I tell personal things to other people too much.
41._____I am too easily bothered by other people making demands of me.
42._____I argue with other people too much.
43._____I am too envious and jealous of other people.
44._____I feel competitive even when the situation does not call for it.
45._____I feel embarrassed in front of other people too much.
46._____I feel too anxious when I'm involved with another person.
47._____I want to get revenge against people too much.

Appendix H

SCHEMA ACTIVATION WRITING PROMPTS

Support Schema (Treatment)

Think for about two minutes about someone who is close to and supportive of you.

Stop after 2 minutes.

"Now, in the blank space I would like for you to write a paragraph or two describing the following four things about your supportive person…"

One…what you like and appreciate most about this person;
Two…what this person likes most about you;
Three…what this person does/or has done for you that is supportive and helpful; and,
Four…how you feel when you are in the presence of this person?

"Try to keep writing until I tell you to stop."

Stop after 5 minutes.

Acquaintance Schema (Control)

Think for about two minutes about any casual acquaintance of yours. Basically, anyone you do not consider a friend, necessarily, but someone you know.

Stop after 2 minutes.

"Now, in the blank space, I would like for you to write a paragraph or two describing the following four things about your acquaintance…"

One…what you know about this person and what you think they are like;
Two…the places and times at which you usually see them;
Three…what this person does when you see them and what they usually talk about; and,
Four…how you feel when you are in the presence of this person?

"Try to keep writing until I tell you to stop."

Stop after 5 minutes.

Appendix I

MOOD QUESTIONNAIRE

Directions: Please rate how much you agree with each statement regarding your current mood using the following scale:

0	**1**	2	3	4	**5**	6	7	8	9	10
None					**Moderately**					**Extremely**

01._____ I currently feel **angry**.

02._____ I currently feel **sad**.

03._____ I currently feel **anxious**.

04._____ I currently feel **guilty**.

05._____ I currently feel **ashamed**.

06._____ I currently feel **worried**.

07._____ I currently feel **afraid**.

08._____ I currently feel **nervous**.

09._____ I currently feel **happy**.

10._____ I currently feel **joyful.**

11._____ I currently feel **amused.**

12._____ I currently feel **pleased.**

Appendix J

CONSULTATION QUESTION

Please answer the following question regarding your current emotional state from participating in the research study.

I would rate the impact of the questions I have answered above on my emotional state on the following scale, with 1 representing no effect, and 5 representing a significant impact such as causing significant sadness or depression.

❑ 1
❑ 2
❑ 3
❑ 4
❑ 5

If you indicated 4 or 5, we are here to help you resolve any negative feelings and/ or assist you in contacting the agencies on the sheet provided to you. Please note, however, that services rendered by some of the listed agencies may be associated with a fee, which you will have to pay. This information is indicated on the sheet provided to you.

Agency	Details
Cook Counseling Center (CCC) 240 McComas Hall Virginia Tech Blacksburg, VA 24061 Phone: (540) 231-6557 Fax: (540) 231-2104 www.ucc.vt.edu	-- Since students pay a health fee at the beginning of the fall semester, they are able to consult a counselor for **free** during fall and spring. Same-day appointments are readily available; the student will take series of assessments and talk to a counselor. The counselor will determine if additional services are needed. Students have to pay a health fee of **$72.50** for each summer session 1 and session 2 to be seen at CCC. They must also be enrolled at least 3 credit hours during the respective summer session. If they are not enrolled, they may meet consult a counselor for 30 minutes to obtain a referral to a different agency for help.
The Women's Resource Center Of the New River Valley P.O. Box 306, Radford, VA 24141 Local Hotline 639 -1123 Toll-Free Hotline 1 - 800 - 788 - 1123 *Shelter:* 639-1123 *Sexual Assault Office:* 639 – 9592 *Administrative Office:* 639 – 9592 FAX 540 - 633 - 2382	A hotline is staffed 24 hours a day to serve individuals in crisis due to domestic violence or sexual assault. All services are offered **free** of charge. Clients often are seen the same day. This is a non-university agency.
Women's Center of Virginia Tech 206 Washington Street Blacksburg, VA 24061 Phone: (540) 231-7806 E-mail: Womctr@vt.edu www.womencenter.vt.edu	This center serves as an on-campus focal point for survivors of sexual assault, relationship violence, stalking, cyber-stalking and harassment are priority concerns for the Women's Center. The services are **free** to faculty, staff, and students. Usually, individuals receive help within 24 hours depending on nature of the crime (e.g., a recent rape is a time-sensitive issue).
Psychological Services Center of Virginia Tech (PSC) 3110 Price's Fork Road Blacksburg, VA 24061 Phone: (540) 231-6914 Fax: (540) 231-4250 www.psycservice.vt.edu	The PSC is a community-based training facility for the Ph.D. program in clinical psychology. The primary purpose of the center is to provide assessment and treatment of mental health problems and life adjustment issues, along with an environment of training for graduate students. Students pay a standard fee of **$20.00** per visit during all semesters. The wait to be seen varies depending on availability of the graduate students. The wait can vary from one day up to two weeks.
ACCESS (RAFT Crisis Hotline) (540) 961-8400 or 1-888-717-3333 or 1-800-suicide www.nrvcs.org/units/ACCESS/RAFT/	This hotline is called ACCESS during business hours (9am to 5pm) and RAFT during non-business hours. They offer **emergency psychiatric services** for Montgomery County. The psychiatric evaluation is $75.00 each hour. If the individual is deemed a danger to themselves or others, they may be hospitalized, which is associated with additional costs.

Appendix K

MEDICAL SCREENING QUESTIONNAIRE

1) Do you have any of the following medical conditions?

- Heart conditions ❑No ❑Yes
- Low blood pressure ❑No ❑Yes
- High blood pressure ❑No ❑Yes
- Fainting spells or bouts of dizziness ❑No ❑Yes
- Diabetes ❑No ❑Yes
- Hypoglycemia ❑No ❑Yes
- Asthma ❑No ❑Yes
- Neurological disorders ❑No ❑Yes
- Epilepsy or seizures ❑No ❑Yes
- Brain disorder ❑No ❑Yes
- Stroke ❑No ❑Yes
- Take medication(s) ❑No ❑Yes
- Other condition_____

1a) If you answered yes for any of the above items, please provide a description:

_____

If you answered no on all items, check this box ❑N/A

1b) If you answered yes for taking medication(s), please list the medication(s) you are currently taking.

_____

If you answered no on all items, check this box ❑N/A

1c) If you answered yes for taking medication(s), is it taken as prescribed? ❑No ❑Yes

2) Have you eaten today? ❑No ❑Yes

2a) If you answered yes, what have you eaten today?

_____

2b) If you answered yes, what time did you last eat?

Approximately _____:_____ (e.g., 1:30)

3) Have you consumed any caffeinated beverages today? ❑No ❑Yes

3a) If you answered yes, what caffeinated beverages did you have today?

_____

3b) If you answered yes, what time did you have these beverages?

Approximately _____:_____ (e.g., 1:30)

4a) What time did you fall asleep last night? Approximately _____:_____ (e.g., 1:30)

4b) What time did you wake up this morning? Approximately _____:_____ (e.g., 1:30)

5) Do you regularly engage in physical exercise? ❑No ❑Yes

5a) If you answered yes, how much and how often do you exercise?

❑1 to 2 times week
❑3 to 4 times week
❑5 to 7 days a week

5b) If you answered yes, did you exercise within the last four hours? ❑No ❑Yes

6) Do you smoke cigarettes or cigars, use snuff, or chew tobacco? ❑No ❑Yes

6a) If you answered yes, how many times do you use these products each day?

❑1 to 2 times day
❑3 to 5 times day
❑More than 5 times day

6b) If you answered yes, when was the last time you used these products?

Approximately _____:_____ (e.g., 1:30)

7a) Do you currently have or have you ever had a hearing problem? ❑No ❑Yes

7b) If Yes, briefly explain:_____

8a) Have you ever been diagnosed as having a learning deficiency or disorder? ❑No ❑Yes

8b) If Yes, briefly explain:_____

Appendix L

MOOD AND COGNITIVE PERFORMANCE STUDY PROCEDURES

Date: _____ Subject ID Number:_____

Assistant name: _____ Experimenter name: _____

SUPPORT CONDITION

SECTION A: SET UP (ALLOW APPROXIMATELY 10 MINUTES FOR COMPLETE SET UP PRIOR TO THE PARTICIPANT'S ARRIVAL)

- For each session there will be an **ASSISTANT** and a *(fictitious)* **EXPERIMENTER** present
- Turn on computer in room 250 → this room is referred to as the **CONTROL ROOM**.
- Turn on computer in room 248 → this room is referred to as the **STUDY ROOM**. Open the following condition website.

- **https://survey.vt.edu/survey/entry.jsp?id=1222776005649**
- On the computer in room 250 locate the folder containing the pre-recorded **SUPPORT WINDOWS MEDIA PLAYER PLAYLIST** of .wav files.
- Get the following materials from the file cabinet in room 248 for setup
  - ❑ Polar heart rate monitor strap
  - ❑ Polar heart rate monitor watch
  - ❑ Stopwatch (not in "beep mode")

❑ Ensure that the time on the stopwatch and the Polar watch are the same.
❑ You should also gather the following documents from the file cabinet in room 250:
  ❑ 2 Informed Consents
  ❑ Debriefing

SECTION B: ONCE PARTICIPANT ARRIVES IN ROOM 248

The **ASSISTANT** is the only person who has contact with the participants. The participants always remain in the **STUDY ROOM**. The **ASSISTANT** greet the participant in room 248. The **ASSISTANT** should review the main parts of the *Phase II Informed Consent Form* with participant by pointing out the following pieces of information.

1. **We are researching factors related to the social, cognitive, and emotional functioning of women survivors of child abuse and neglect. Moreover, we are interested in how thoughts affect emotional arousal.**

2. **You will complete two cognitive tasks, physiological measures, and questionnaires.**

3. **All the information discussed today is confidential and we are extremely respectful of what you tell us today.**

4. **To measure heart-rate, you will be wearing a small band which will be fitted around your torso. In addition, there is small amount of water-soluble gel that is put on the back of the band.**

5. **If you express the intent to hurt yourself or others, I am obligated to get help and this would not be confidential information.**

6. **Everyone who participates in Phase 1 will receive course credit if a psychology student. In addition, everyone who participates in Phase 2 will receive course credit if a psychology student. Phase II participants will also be entered in a raffle to receive a $50.00 gift certificate.**

7. **Your name will not be directly associated with the data and no information is released unless you grant permission.**

8. **In regard to benefits of the study, we are interested in identifying factors related to social, cognitive, and emotional functioning of women survivors of child abuse and neglect and this study will lead to a greater understanding of these issues.**

9. **You can withdraw at any time and still be part of the raffle and get course credit. There are no penalties for withdrawing at any time.**

10. **This study was reviewed by the Psychology Department Human Subjects Committee and the university's Institutional Review Board, and was found to be in compliance with federal, laws, regulations, and guidelines.**

- ❑ Make sure to ask if she has any questions.
- ❑ Give her time to read the consent form and sign (file the signed form in Room 248).
- ❑ Give the participant a blank "Phase II Informed Consent Form" to take with her.

Immediately, state the following:

- ❑ **Your subject ID number is _____. Please enter this ID number on the Welcome Page and click the "submit button." <u>Please click the link to go to the next page.</u> Enter your subject ID at the top of the *Medical Screening Questionnaire* and complete the questionnaire. C<u>lick submit and stop.</u> I will show you how to wear the heart rate monitor.**

SECTION C: ATTACHING POLAR MONITOR

THIS SHOULD BE DONE BY A FEMALE ASSISTANT.
NO MALES SHOULD BE PRESENT IN THE ROOM.

- ❑ The **ASSISTANT** instructs participant how to wear Polar WearLink Coded Transmitter (soft strap):
  - Strap goes just around the torso (just below the bra). Demonstrate where to put it on yourself. Also, there is a poster on the back of the door in the **CONTROL ROOM** and the **BATHROOM** that shows positioning.
  - Tell her to wrap the band around her torso and snap the loose end of strap into place (demonstrate for her).
  - Tell her to put it on as snug as possible and show her how to the adjust strap.
  - Before she proceeds to put on the strap, place a "dime-sized" amount of electrode gel on each of the gray areas (electrodes) of the strap. Smooth out the gel across the gray areas with a popsicle stick. In general, make sure there is enough gel to cover the entire gray areas.
  - HAVE THEM GO TO BATHROOM AROUND CORNER TO PUT ON THE STRAP

- ❑ When the participant comes back,
  - Make sure the watch is in the time/ date mode.
  - Place watch on their wrist of the <u>non-dominant hand;</u> it can be awkward for them to do it themselves
  - Press the red button in center of the watch <u>once</u>; heart rate should register.
  - Press red button <u>again</u>; heart rate should begin recording.

POLAR CONNECTION TIME (hour, minute, seconds):
You should use the current time of day on the stopwatch.

SECTION D: BASELINE PERIOD

- ❑ Open WATERFALL video in full screen mode
- ❑ Tell the participant the following:

"Please sit in front of the computer and watch this video."

Immediately,

- ❑ **START** the video and **ASSISTANT** leave the room.

- ❑ The **ASSISTANT** exits the room and the **EXPERIMENTER** records the time that the baseline period begins in the space provided.

EM1 TIME [Vanilla baseline starts] (hour, minute, seconds):
You should use the current time of day on the stopwatch.

❑ When the video stops, the **EXPERIMENTER** records the time that baseline ends in the space provided.

EM2 TIME [Vanilla baseline ends] (hour, minute, seconds): **You should use the current time of day on the stopwatch.**

Immediately when the video stops, the **EXPERIMENTER**

❑ **STARTS** the **SUPPORT WINDOWS MEDIA PLAYER PLAYLIST** of .wav files, which begins with Introduction01.wav that states:

Close Windows Media Player (the video you just watched). Locate the webpage with the Medical Questionnaire you completed before and please click the link to go to the next page. Enter your subject ID at the top of *Mood and Cognition Page 3* and complete the questionnaire. When you are done click submit. Do not click the link to go to the next page until I tell you to.

❑ **STOP** the Introduction01.wav.

After the participant completes the first Mood Questionnaire:

Immediately the **EXPERIMENTER**

❑ **STARTS** Introduction02.wav from the playlist, which states:

"You will be participating in two cognitive (mental) tasks, one linguistic (language-based) and one mathematic. I will be communicating with you through the intercom system. Try to listen closely, because you will not be able to respond to me through the intercom. "

❑ **STOP** the Introduction02.wav.

SECTION E: "LINGUISTIC TASK" PERIOD

(NOTE*: If at any time participant asks questions after voice files are started, the **ASSISTANT** go to room 250 and answer questions; **don't answer over the intercom**).

Immediately the **EXPERIMENTER**

❑ **STARTS** support_condition01.wav, which states:
"This task is timed, so please pay attention. Please click the link to go to the next page."

❑ **LET THE PLAYLIST KEEP PLAYING→ DON'T STOP IT.**

Immediately,

❑ Support_condition02.wav, **PLAYS** which states:
"I want you to think for about two (2) minutes about someone who is close to and supportive of you."

❑ When the support_condition02.wav stops, the **EXPERIMENTER** records the time that linguistic task begins in the space provided.

EM3 TIME [Schema priming starts] (hour, minute, seconds):
You should use the time on the stopwatch.

After 2 minutes,

❑ Support_condition03.wav, **PLAYS** which states:
"Now, in the blank space on page 4, I would like for you to write a paragraph or two describing the following four things about your supportive person…"

- **One…what you like and appreciate most about this person;**
- **Two…what this person likes most about you;**
- **Three…what this person does/or has done for you that is supportive and helpful;**
- **and, Four…how you feel when you are in the presence of this person.**

"Try to keep writing until I tell you to stop."

After 5 minutes

❑ Support_condition04.wav, **PLAYS** which states:
"STOP. Click the submit button. Please click the link to go to the next page. Enter your subject ID at the top of *Mood and Cognition Page 5* and complete the questionnaire and then click the submit button. Do not click to go to the next page until I tell you to. "

❑ **STOP** the support_condition04.wav.

❑ When the support_condition04.wav stops, the **EXPERIMENTER** records the time that linguistic task ends in the space provided.

EM4 TIME [Schema priming ends] (hour, minute, seconds):
You should use the time on the stopwatch.

SECTION F: "MATHEMATIC TASK" PERIOD

❑ Wait for the participant to complete the Mood Questionnaire.
❑ After they complete the questionnaire the **EXPERIMENTER**
STARTS Math Task.Part01.wav, which states:

"The next task measures cognitive performance while assessing physiological activation. We're doing this to assess what physiological activation might enable high cognitive performance, so try and do your best on this task. In this task, you have to count backwards in steps of 7. Please DO NOT use pencil and paper. Count out loud, say each number out loud. I will tell you when to stop and then ask your result. Count as quickly as you can. Start when I say the number. Listen closely, because I will not repeat the numbers."

❑ **LET THE PLAYLIST KEEP PLAYING→ DON'T STOP IT.**

❑ When Math Task.Part01.wav stops, the **EXPERIMENTER** records the time that math task starts in the space provided.

EM5 TIME [Mood induction starts] (hour, minute, seconds):
You should use the time on the stopwatch.

After 5 seconds Math Task.Part02.wav starts, which states:
***[Clear throat loudly*]. Start at 13275 (Thirteen thousand, two hundred seventy-five). Start now.**

After 60 seconds Math Task.Part03.wav starts, which states:
"*[loud beep]* Okay, stop now. What number are you at?" … "OK. *[with large sigh]*"

Immediately, Math Task.Part04.wav starts, which states:
"Now start again, counting backwards in steps of 7. One thing though – I can see that you are introducing movement artifacts by moving around too much. So stay still during this procedure. Also, SPEAK UP – I can hardly understand you over the intercom, so…um…then I won't be able to use your data. Also, would you answer a little faster so we can get through this more quickly? Start at the number 15123 (Fifteen thousand, one hundred twenty-three). Start now."

After 60 seconds Math Task.Part05.wav starts, which states:
"*[loud beep]* Okay, stop now. What number are you at?" … "OK. *[with large sigh]*"

After 60 seconds Math Task.Part06.wav starts, which states:
"Okay *[large exhale]*. Ummm, count backwards in steps of 13. Start at the number 13027 (Thirteen thousand, twenty-seven)." "Start now."

After 60 seconds Math Task.Part07.wav starts, which states:
"*[loud beep]* Okay, stop now. What number are you at?" … "OK. *[with large sigh]*"

Immediately, Math Task.Part08.wav starts, which states:
"Okay start at 12045 (Twelve thousand, forty-five). Start now. Steps of 13."

After 60 seconds Math Task.Part09.wav starts, which states:
"*[sucking on a straw]* Okay, stop now. What number are you at?" … "OK. *[with large sigh]*"

After 30 seconds Math Task.Part10.wav starts, which states:
***[Slight pause]* "I can't understand you properly, please articulate *[5 seconds; use stopwatch]*. Alright, start over. *[sigh]* Count backwards in steps of 7 starting at 15293 (Fifteen thousand, two hundred ninety-three). Say your results loudly while counting Loudly." "Start now."**

After 60 seconds Math Task.Part11.wav starts, which states:
"*[loud beep]* Okay, stop now. What number are you at?" … "OK. *[with large sigh]*"

Immediately, Math Task.Part12.wav starts, which states:
"Ok, count backwards in steps of 7 from 18652 (Eighteen thousand, six hundred fifty-two). Start now."

After 60 seconds Math Task.Part13.wav starts, which states:
"*[loud and long beep]* Okay, stop now. What number are you at?" … "OK. [with large sigh]"

Immediately, Math Task.Part14.wav starts, which states:
"Okaaaay. Uhhhhhh. *[pause]* Okay, so I think I know what's going on with the uhh physio signals. If I could recalibrate them *[smack lips]* that would be good. *[deep inhale, then exhale]* So I'll try to do that. Uhhhhh, if you could help by just sitting really still for about one minute, that would be good. So just sit still, really still, for the next minute and uhh, I will let you know when that's over *[inhale]* and then we can uhhh *[exasperated]* try to make this work somehow. Okay, uhhhh. Start now from 18525 (Eighteen thousand, five hundred twenty-five). Steps of 7. Start now."

After 60 seconds Math Task.Part15.wav starts, which states:
***[*messed up beeps and shrill pitch*][Says dismissively]* "Okay. I still can't get the proper signals. Let's stop. *[sigh]*. Please click the link to go to the next page. Enter your subject ID at the top of *Mood and Cognition Page 6* and complete the questionnaire and then click the submit button. Do not click to go to the next page until I tell you to. "**

❑ **STOP** the **SUPPORT WINDOWS MEDIA PLAYER PLAYLIST**.

❑ When the **SUPPORT WINDOWS MEDIA PLAYER PLAYLIST** stops the **EXPERIMENTER** records the time that math task ends in the space provided.

EM6 TIME [Mood induction ends] (hour, minute, seconds):
You should use the time on the stopwatch.

- ❑ The **ASSISTANT** should return to the participant in room 248.

- ❑ Stop the heart rate recording by pressing the lower left button which has a square symbol (indicating stop) ONCE. Then, press it a SECOND time to return to time/date mode.

POLAR DISCONNECTION TIME (hour, minute, seconds):
You should use the current time of day on the stopwatch.

- ❑ Ask participant to go to the bathroom to remove chest strap and to clean off the electrode gel from her body. Again, unsnapping can be difficult→tell them not to worry about breaking it.

SECTION G: CLOSE SESSION

- ❑ When the participant returns, administer the **DEBRIEFING**.
- ❑ The **ASSISTANT** should state:
  Please click the link to go to the next page. Enter your subject ID at the top of *Consultation Question*."
- ❑ Give every participant the **LIST OF IMPORTANT NUMBERS**.
- ❑ Thank participant for coming.
- ❑ Since this task might have been stressful, make sure that you end on a positive note. Offer them some candy from our jar and engage in a little small talk. Overall, don't let them leave "angry!"
- ❑ CHECK ALL DOCUMENTS AND ENSURE THEY ARE COMPLETE (NO MISSING DATA)!

SECTION H: POST SESSION

- ❑ **Uploading the Polar Heart Rate File to the computer:**
  - Open Polar software on the computer.
  - Press CANCEL for the first screen that pops up.
  - Select the "ANGELA SCARPA" profile (if this profile is already selected the title for it will appear in the right corner of the calendar). If this is not the profile currently selected, then go to OPTIONS→SWITCH PERSON→choose ANGELA SCARPA
  - Using scroll buttons on the right side of the watch; scroll until it says "CONNECT
  - " at the top.
  - Place and orient the watch on the table so that the red window at the top of the watch is in front of the Polar IR interface (little white

device with a red plastic window), which is connected to the computer by USB port (do not connect this device).
- Then, on the computer's toolbar locate the 6th icon from the left, which is a picture of a watch with a blue screen and little yellow sparkle→this is the CONNECTION button.
- A screen will appear on the computer that has a green bar indicating the progress of your file uploading.
- Then another screen will appear. Click on the "EXERCISE FILES" button.
- Then on this next screen, type in the following:
  - For EXERCISE: actual subject number
  - For NOTES: "Subject #" and then the actual number (e.g., Subject # 2024)
- Click SAVE and then CLOSE.

❑ **Clearing the watch/ Deleting the old file:**
- The watch will need to be cleared of this subject file to free up memory for the next person to use the watch. Follow these steps to clear the watch.
- If the watch is still showing "CONNECT", press STOP button (lower left button of watch)
- With scroll buttons (on right of watch), scroll up to "FILE"
- Hold down the top left button (backlight button) until "DELETE FILES" is displayed. Press OK (the red button), press again when the watch asks "ARE YOU SURE". All files are deleted.
- Press stop (button on bottom left) to return to time/date screen.

❑ **Cleaning the strap:**
- Make sure to clean the strap in the bathroom with soap and warm water.
- Hang the strap in the room to dry.
- <u>When storing the strap make sure that it is not still attached to the receiving device (the plastic black square).</u>

❑ administer the funneled debriefing form.
❑ Thank participant for coming.

Appendix M

DEBRIEFING FORM

A. Before we go on to talk about this experiment, I just need to ask you a few questions:

1. **Do you have any questions or comments about anything so far?**

2. **Anything strike you as particularly interesting or unusual?**

3. **What did you think of the mathematics task?** *(Check to see if they understood the task. For example, what was the purpose of the mathematics task?)*

4. **What did you think of the linguistic task?** *(Check to see if they understood the manipulation. For example, what was the purpose of the linguistic task?)*

B. The study actually is over now, but before I tell you more about it, I need to ask you some questions about your experience.

1. **First, do you have any ideas about what we were actually interested in studying?**

2. **Do you think that anything you did on one task affected what you did on any other task?**
   ❑YES ❑NO
   ***IF YES,* how exactly did it affect you?**

The purpose of the experiment is for us to see how thinking about a significant other can influence emotional reactivity. I only gave you a vague idea at the beginning of the study of what the experiment's purpose was. Sometimes, when we are studying how people think and behave, we don't give them a full description of what we are interested in. That way we are able to get natural responses. Not every psychology study does this. However, there are a few things about this experiment that I would like to explain.

The first thing I need to tell you is that your mathematics performance today really does not mean anything and it is a task that most anyone would find frustrating—that's why we chose it. *(if necessary, continue to reassure that unfavorable test results is what we would expect from any average person.)*

Although we are doing things at a very low level here, we'd like to apply our result real-world scenarios such as treatments for adult survivors of child maltreatment. Therefore, it really is important that we do get people's natural reactions. For that reason, please do not talk to anyone about the details of the study especially any of your friends who are in Introduction to Psychology or any other class. We will be running this study for at least a couple of semesters, and sometimes if people know what the study is about it can bias their responses even when they don't mean for it to. If your friends have already been in the study, then that's fine, and you can talk all you want. But with your friends who haven't been in the study yet, we just ask that you refrain for giving them the details about the study. Do you have any questions?

If you feel concerned or uncomfortable about the fact that you were intentionally deceived, you may tell us to withdraw your data from the sample. Remember that your results are confidential to me and my supervisor, and that all results are published anonymously as group data. If

participating in this experiment has caused sufficient distress you that you wish to speak to a counselor, please contact one of the following:

If you have any complaints, concerns, or questions about this research, please feel free to contact the study examiner, Anthony O. Wells at (540) 818-3379, or the faculty advisor, Dr. Angela Scarpa at (540) 231-2615.

Thank you for helping us in this research!

Appendix N

INFORMED CONSENT FORM
(Phase I Screening)

Study Title: Modulating Emotional Reactivity via Social Support Schemas in Adult Survivors of Child Maltreatment

Investigator: Anthony O. Wells, M.S.
Angela Scarpa, Ph.D.

I. Purpose of this Research/Project

The purpose of this project is to assess factors related to the social, cognitive, and emotional functioning of women survivors of child abuse and neglect.

II. Procedures

I am being asked to help the above researchers in a project. My part of this project will be to fill out a series of questionnaires about traumas experienced in childhood as well as since I've been an adult. I will also be asked to complete other questionnaires about other areas of my life, as it is now. After completing these questionnaires, I may be contacted again, by the researchers to return to the lab for a second session. During the lab session, I will also complete two cognitive tasks, one linguistic (language-based) and another mathematics. During the second session, the researchers also will collect some physiological heart rate data. The second session constitutes Phase II, and I will receive a separate consent form if I am eligible and choose to return for that session. Today, I am giving consent for both Phases I.

If I decide to participate, the first session (Phase I) will consist of answering approximately 60 questions online and will last between 30 to 40 minutes. If contacted after the first session, the second part of my participation (Phase II) will likely last another 45 hours. I understand that my responses will be confidential, unless I decide to contact one of the researchers about issues that may arise during the study or if I express intent to harm or kill myself or someone else. If at any time during the questionnaire process issues come up that are stressful or difficult, there are phone numbers listed on the main webpage of places that I can contact to get support in dealing with my distress. Also, I may stop answering questions at any time. If I do indeed feel like hurting myself or someone else, I am strongly encouraged to contact the Cook Counseling Center, on campus. They are specifically adapted to handle these types of cases. Their telephone number is (540) 231-6557.

III. Risks

There may be emotional discomfort for me as a participant. If, in thinking about past abuse and/ or neglect experiences I become emotional or agitated in any way, I understand that I may notify the experimenter, who is trained in intervention for such matters. If further assistance is needed, the principal investigator who is a licensed clinical psychologist, Dr. Angela Scarpa, will be called. If I need help immediately and Dr. Scarpa cannot be reached, the experimenter will assist me in contacting the Cook Counseling Center or RAFT crisis hotline.

IV. Benefits

There is a societal benefit of increasing the understanding of factors related to social and emotional functioning of adult survivors of child maltreatment.

V. Confidentiality

All of my responses will be completely confidential. I will provide my name, phone number, and email contact info only for the purpose of getting academic course credit and being contacted for Phase II. A code number will be assigned to my answers and only this number will be associated with the data. A master list with my name, contact email, and phone number will be kept in a private and locked location. Please note that although the responses to the questionnaire require a password for entry and completion of the questionnaire, this does not guarantee complete confidentiality should the responses be intercepted inappropriately from the Internet.

At no time will the researchers release identifying information from this study to anyone other than the individuals working on the project without my written consent, with one exception. If I express intent to harm or kill myself or someone else, the researchers are legally obliged to inform an authority. In this case, I will be informed of the need to do so, and am encouraged to contact with the researchers either the Cook Counseling Center (231-6557) or the Psychological Services Center
(231-6914).

VI. Compensation

Introductory Psychology undergraduates will receive extra credit points averaged into their final grade, with one credit for every hour or hour portion of participation in the current semester. Undergraduates in other courses may receive extra credit, as determined by their course instructor. Participants who are contacted after the first session, and choose to participate in the second session will also receive course credit for the second session.

VII. Freedom to Withdraw

This project has been explained to me and I have been allowed to ask questions about it. I understand that I do not have to fill out the questionnaires or participate in any way if I do not want to and no one will treat me badly. I can stop part way through or withdraw at any time, if I choose. If I decide to withdraw, I understand that extra credit will be prorated based on my length of participation in the study, where one credit is awarded for each hour of participation. I also understand that as per university policy and Psychology Department policy, my course instructor can provide me with other opportunities for extra credit.

IX. Participant's Responsibility

I am responsible for filling out several questionnaires about past and recent experiences, as well as providing my contact information if I would be willing to participate in the second session. I expect each session to last approximately one hour.

X. Participant's Permission

I have read and understood the Informed Consent Form and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for participation in this project. If I participate, I may withdraw at any time without penalty. I agree to abide by the rules of this project.

By completing the online survey you are giving consent to participate in this study. If you do not wish to participate, simply exit the survey now.

Should I have any pertinent questions about this research or its conduct, and research subjects' rights, and whom to contact in the event of a research-related injury to the subject, I may contact:

Anthony O. Wells
Principal Investigator
phone: 818-3379
wellsa@vt.edu

Dr. Angela Scarpa
Principal Investigator
phone: 231-2615
ascarpa@vt.edu

Dr. David Moore
Chair, IRB
1880 Pratt Drive
(Corporate Research Center), Suite 2006
phone: 231-4991
moored@vt.edu

Dr. David Harrison
Chair, Psychology Human
Subjects Committee
phone: 231-4422
dwh@vt.edu

Appendix O

INFORMED CONSENT FORM
(Phase II Experiment)

Study Title: Modulating Emotional Reactivity via Social Support Schemas in Adult Survivors of Child Maltreatment

Investigator: Anthony O. Wells, M.S.
Angela Scarpa, Ph.D.

I. Purpose of this Research/Project

The purpose of this project is to assess factors related to the social, cognitive, and emotional functioning of women survivors of child abuse and neglect.

II. Procedures

Today, I will complete a questionnaire regarding my health status and two cognitive tasks, one linguistic (language-based) and another mathematic. Also, the researchers will collect some physiological heart rate data. Heart rate will be measured using a small strap worn around my around and a watch receiver device worn on my non-dominant wrist. No garments need to be removed to wear the strap; however, the garment may need to be lifted to place attach the strap and then returned to its normal position. I will be shown how to apply the strap by a female experimenter, and then I will be asked to apply the strap myself and notify the experimenter when I am done. If I do not feel comfortable doing this, I am not required do so. I may also request that the female experimenter apply the strap. There could be some discomfort from wearing or removing the strap, much like the feeling of a Band-Aid. I am giving consent for Phases II of this study.

If I decide to participate, this session (Phase II) will last approximately 45 minutes. I understand that my responses will be confidential, unless I decide to contact one of the researchers about issues that may arise during the study or if I express intent to harm or kill myself or someone else. If at any time during my participation in this study issues come up that are stressful or difficult, the researchers will be available to direct me to the most appropriate resource. If I do indeed feel like hurting myself or someone else, I am strongly encouraged to contact the Cook Counseling Center, on campus. They are specifically adapted to handle these types of cases. Their telephone number is (540) 231-6557.

III. Risks

There may be emotional discomfort for me as a participant. If at any time during the study, I become emotional or agitated in any way, I understand that I may notify the experimenter, who is trained in intervention for such matters. If further assistance is needed, the principal investigator who is a licensed clinical psychologist, Dr. Angela Scarpa, will be called. If I need help immediately and Dr. Scarpa cannot be reached, the experimenter will assist me in contacting the Cook Counseling Center, RAFT crisis hotline, or Psychological Services Center.

As stated above, there could be some discomfort from wearing or removing the heart rate monitor (strap), much like the feeling of a Band-Aid. Note, however, that these procedures have been used by these investigators in other studies with no complaints.

IV. Benefits

There is a societal benefit of increasing the understanding of factors related to social, cognitive, and emotional functioning of adult survivors of child abuse and neglect.

V. Extent of Anonymity and Confidentiality

All of my responses will be completely confidential. I will provide my name only for the purposes of getting academic course credit, but not in relation to my particular set of questionnaires, responses on the computer tasks, or physiological data. A code number will be assigned to my answers and only this number will be associated with the data. A master list with my name, contact email, and phone number will be kept in a private and locked location. My phone number and email contact info were only used for the research team to contact me for this second session of the study. At no time will the researchers release identifying information from this study to anyone other than the individuals working on the project without my written consent, with one exception. If I express intent to harm or kill myself or someone else, the researchers are legally obliged to inform an authority. In this case, I will be informed of the need to do so, and am encouraged to contact with the researchers either the Cook Counseling Center (231-6557) or the Psychological Services Center
(231-6914).

VI. Compensation

Introductory Psychology undergraduates will receive extra credit points averaged into their final grade, with one credit for every hour or hour portion of participation in the current semester. Undergraduates in other courses may receive extra credit, as determined by their course instructor.

VII. Freedom to Withdraw

This project has been explained to me and I have been allowed to ask questions about it. I understand that I do not have to fill out the questionnaires or participate in any way if I do not want to and no one will treat me badly. I can stop part way through or withdraw at any time, if I choose. If I decide to withdraw, I understand that extra credit will be prorated based on my length of participation in the study, where one credit is awarded for each hour of participation. I also understand that as per university policy and Psychology Department policy, my course instructor can provide me with other opportunities for extra credit.

IX. Participant's Responsibility

I am responsible for answering questions asked by the research team about my mood, completing cognitive tasks, providing my physiological data.

X. Participant's Permission

I have read and understood the Informed Consent Form and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for participation in this project. If I participate, I may withdraw at any time without penalty. I agree to abide by the rules of this project.

_____ Date_____

Subject signature

Should I have any pertinent questions about this research or its conduct, and research subjects' rights, and whom to contact in the event of a research-related injury to the subject, I may contact:

Anthony O. Wells Principal Investigator	phone: 818-3379 wellsa@vt.edu
Dr. Angela Scarpa Principal Investigator	phone: 231-2615 ascarpa@vt.edu
Dr. David Moore Chair, IRB 1880 Pratt Drive (Corporate Research Center), Suite 2006	phone: 231-4991 moored@vt.edu
Dr. David Harrison Chair, Psychology Human Subjects Committee	phone: 231-4422 dwh@vt.edu

Table 1

Sociodemographics and Descriptive Statistics for All Laboratory Phase Eligible Participants

	Eligible and did not participate (N=471)	Laboratory subjects (N=126)	Total (N=597)	Test Statistic
Age	19 (1.37)	19 (1.22)	19 (1.34)	t = -1.50
Interpersonal Problems	1.76 (.12)	1.76 (.10)	1.76 (.12)	t = -.31
Affect Intensity	3.57 (.50)	3.60 (.50)	3.57 (.50)	t= .63
Child Sexual Abuse Severity	0.00	0.00	0.00	U=27750.00
Child Physical Abuse Severity	2.00	2.00	2.00	U=27489.00
Child Neglect Severity	6.00	5.00	5.00	U=28178.50
Endorsed Child Sexual Abuse	59 (12.5)	19 (15.1)	78 (13.1)	V= .03
Endorsed Child Physical Abuse	363 (77.1)	98 (77.8)	461 (77.2)	V=.01
Endorsed Pervasive Child Neglect	194 (41.2)	52 (41.6)	246 (41.3)	V=.00
Ethnicity/ race				V=.07
European-American	366 (78.2)	104 (82.5)	470 (79.1)	
African-American	25 (5.3)	5 (4.0)	30 (5.1)	
Hispanic-American	12 (2.6)	1 (0.8)	13 (2.2)	
Asian-American	50 (10.7)	14 (11.1)	64 (10.8)	
Other Ethnicity	15 (3.2)	2 (1.6)	17 (2.9)	
Martial Status				V=.05
Married	1 (0.2)	0 (0.0)	1 (0.2)	
Long-term relationship	97 (20.6)	30 (23.8)	127 (21.3)	
Divorced or separated	2 (0.4)	0 (0.0)	2 (0.3)	

Single/Never Married	370 (78.7)	96 (76.2)	466 (78.2)	
Class				V=.05
Wealthy	12 (2.6)	3 (2.4)	15 (2.5)	
Upper Middle Class	187 (40.0)	46 (36.5)	233 (39.2)	
Middle Class	201 (42.9)	59 (46.8)	260 (43.8)	
Lower Middle Class	45 (9.6)	13 (10.3)	58 (9.8)	
Blue-collar/Working Class	15 (3.2)	4 (3.2)	19 (3.2)	
Poor/Working Class	6 (1.3)	1 (0.8)	7 (1.2)	
Poor/Unemployed	2 (0.4)	0 (0.0)	2 (0.3)	

Note: Interpersonal problem scores were log 10 transformed. Means and standard deviations (in parentheses) are provided for normally distributed continuous variables, but for maltreatment severity variables medians are provided. For continuous variables, differences between groups were tested using t-tests or Mann-Whitney U tests. Counts and percentages (in parentheses) are reported for nominal and ordinal variables. For nominal and ordinal variables, differences between the groups were tested using Cramer's V test.

$p<.001$***, $p<.01$**, $p< .05$*

Table 2

Sociodemographics and Descriptive Statistics for Final Laboratory Phase Sample

	Schema Activation		
	Acquaintance (n=58)	Support (n=61)	Total (N=119)
Means and (Standard Deviations)			
Age	19 (1.24)	19 (1.24)	19 (1.23)
Interpersonal Problems	1.76 (0.11)	1.77 (0.10)	1.76 (0.10)
Affect Intensity	3.80 (0.52)	3.80 (0.56)	3.80 (0.54)
Counts and (Percentages)			
European-American	49 (84.5%)	50 (82%)	99 (83.2%)
African-American	2 (3.4%)	3 (4.9%)	5 (4.2%)
Hispanic-American	1 (1.7%)	0 (0.0%)	1 (0.8%)
Asian-American	5 (8.6%)	7 (11.5%)	12 (10.1%)
Other Ethnicity	1 (1.7%)	1 (1.6%)	2 (1.7%)
Long-term relationship	15 (25.9%)	12 (19.7%)	27 (22.7%)
Single/Never Married	43 (74.1%)	49 (80.3%)	92 (77.3%)
Wealthy	2 (3.4%)	2 (3.3%)	4 (3.4%)
Upper Middle Class	24 (41.4%)	22 (36.1%)	46 (38.7%)
Middle Class	24 (41.4%)	29 (47.5%)	53 (44.5%)
Lower Middle Class	7 (12.1%)	5 (8.2%)	12 (10.1%)
Blue-collar/Working Class	1 (1.7%)	2 (3.3%)	3 (2.5%)
Poor/Working Class	0 (0.0%)	1 (1.6%)	1 (0.8%)

Note: Interpersonal problem scores were log 10 transformed.

Table 3

Schema Activation by Maltreatment Subtypes

Maltreatment subtype	Schema Activation		Total (N=119)
	Acquaintance (n=58)	Support (n=61)	
Sexual Abuse: kissed/ hugged	7 (12.7%)	3 (4.92%)	10 (8.40%)
Sexual Abuse: fondling (non-genital)	5 (8.62%)	6 (9.84%)	11 (9.24%)
Sexual Abuse: fondling (genital)	5 (8.62%)	3 (4.92%)	8 (6.72%)
Sexual Abuse: oral sex	0 (0.00%)	2 (3.28%)	2 (1.68%)
Sexual Abuse: sexual intercourse	0 (0.00%)	1 (1.64%)	1 (0.84)
Sexual Abuse: anal intercourse	0 (0.00%)	0 (0.00%)	0 (0.00%)
Sexual Abuse: coercive sex	2 (3.45%)	0 (0.00%)	2 (1.68%)
Sexual Abuse: any form	8 (13.79%)	8 (13.11%)	16 (13.45%)
Physical Abuse: hit hard	31 (53.44%)	28 (45.90%)	59 (49.58%)
Physical Abuse: kicked	12 (20.69%)	10 (16.39%)	22 (18.49%)
Physical Abuse: punched	11 (18.97%)	8 (13.11%)	19 (15.97%)
Physical Abuse: thrown down	17 (29.31%)	15 (24.59%)	32 (26.89%)
Physical Abuse: stabbed	0 (0.00%)	0 (0.00%)	0 (0.00%)
Physical Abuse: belt or hard object	21 (36.21%)	27 (44.26%)	48 (40.34%)
Physical Abuse: other physical act	15 (25.86%)	15 (13.11%)	30 (25.21%)
Physical Abuse: any form	45 (77.59%)	45 (73.77%)	90 (75.63%)
Neglect: Cognitive Needs	32 (55.17%)	33 (54.10%)	65 (54.62%)
Neglect: Supervisory Needs	10 (17.24%)	7 (11.48%)	17 (14.29%)
Neglect: Emotional Needs	38 (65.52%)	39 (63.93%)	77 (64.70%)

Neglect: Physical Needs	6 (10.34%)	8 (13.11%)	14 (11.76%)
Neglect: Any form	45 (77.59%)	46 (75.41%)	91 (76.47%)

Note: Parentheses contain column (acquaintance versus support) percentages.

Table 4

Schema Activation by Polyvictimization

	Schema Activation		
Maltreatment Forms Experienced	Acquaintance (n=58)	Support (n=61)	Total (N=119)
1 Form	20 (34.5%)	25 (41.0%)	45 (37.8%)
2 Forms	33 (56.9%)	33 (54.1%)	66 (55.5%)
3 Forms	5 (08.6%)	3 (04.9%)	8 (06.7%)

Note: Parentheses contain column (acquaintance versus support) percentages.

Table 5

Dependent Variable by Schema Activation by Experimental Epoch

Measure	Schema Activation	Baseline	Harassment	Δ	Paired *t*-statistic
State anger	Support	00.36 (00.91)	02.49 (02.52) [a]	02.13 (2.63)	
	Acquaintance	00.43 (01.08)	03.59 (02.49) [a]	03.16 (2.43)	
	Total sample	00.39 (00.99)	03.03 (02.56)	02.63 (02.57)	11.15***
Heart rate	Support	78.99 (10.03)	91.45 (13.92)	12.46 (10.30)	
	Acquaintance	82.70 (11.25)	93.74 (12.49)	11.04 (9.63)	
	Total sample	80.80 (10.76)	92.56 (13.24)	11.78 (09.96)	12.89***
RMSSD	Support	46.70 (24.90)	34.48 (15.48)	-12.22 (18.08)	
	Acquaintance	43.56 (25.95)	31.74 (14.72)	-11.81 (17.78)	
	Total sample	45.17 (25.36)	33.15 (15.12)	-12.02 (17.86)	-7.34***

Note: Shared superscripts indicate that mean differences were statistically significant per independent sample t-tests. Standard deviations are in parentheses; Change scores calculated as harassment minus baseline.

$p<.001$***, $p<.01$**, $p< .05$*

Table 6

Bivariate Correlations

Variable	1	2	3	4	5	6	7	8	9
1. Schema activation	—								
2. Interpersonal problems	0.05	—							
3. Affect Intensity	.00	.24**	—						
4. State anger reactivity	-0.20*	0.17	.11	—					
5. Heart rate reactivity	0.07	-0.13	.00	0.07	—				
6. rMSSD reactivity	-0.01	0.11	-.02	-0.17	-0.55**	—			
7. Post-harassment: Challenged	-0.20*	0.05	.05	0.40**	0.18*	-0.18*	—		
8. Post-harassment: Intimidated	-0.18*	0.14	.02	0.48**	0.21*	-0.12	0.65**	—	
9. Post-harassment: Control	0.05	-0.05	.11	0.17	0.07	-0.09	0.18*	0.09	—

p<.01**, *p*< .05*

Table 7

Statistical Model for the Moderation Effect of Schema Activation on Interpersonal Problems and State Anger Change Relationship

Variable	B	SE	β	*Total* R^2	$R^2\Delta$
Block 1				.03	.03
Interpersonal Problems	4.34	2.32	.17*		
Block 2				.07	.04*
Interpersonal problems	4.63	2.28	.18*		
Schema activation	-1.08	2.28	-.21*		
Block 3				.10	.03*
Interpersonal problems	8.85	3.09	.35**		
Schema activation	-1.10	.45	-.22**		
Interaction	-8.96	4.50	-.24*		

$p < .01$**, $p < .05$*

Table 8

Statistical Model for the Moderation Effect of Schema Activation on Interpersonal Problems and rMSSD Relationship

Variable	B	SE	β	*Total* R^2	$R^2\Delta$
Block 1				.01	.01
Interpersonal Problems	19.62	16.20	.11		
Block 2				.01	.00
Interpersonal problems	19.79	16.29	.12		
Schema activation	-.62	3.29	-.01		
Block 3				.05	.04*
Interpersonal problems	-11.92	22.08	-.07		
Schema activation	-.42	3.24	-.01		
Interaction	-66.62	32.18	-26*		

p< .01**, *p*< .05*

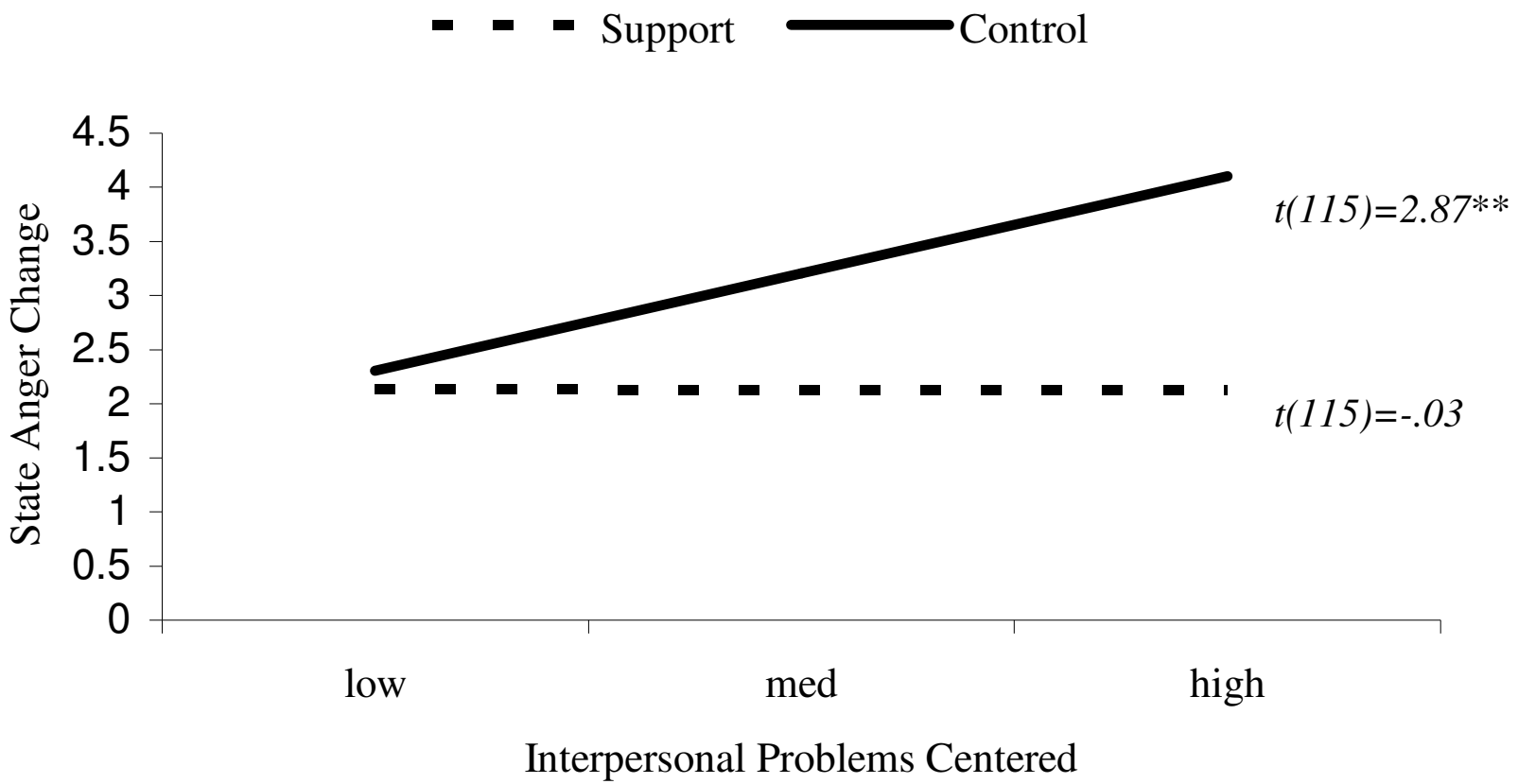

Figure 1. Relationship between interpersonal problems and state anger change among adult survivors in the support schema activation versus control group. $p<.01$**

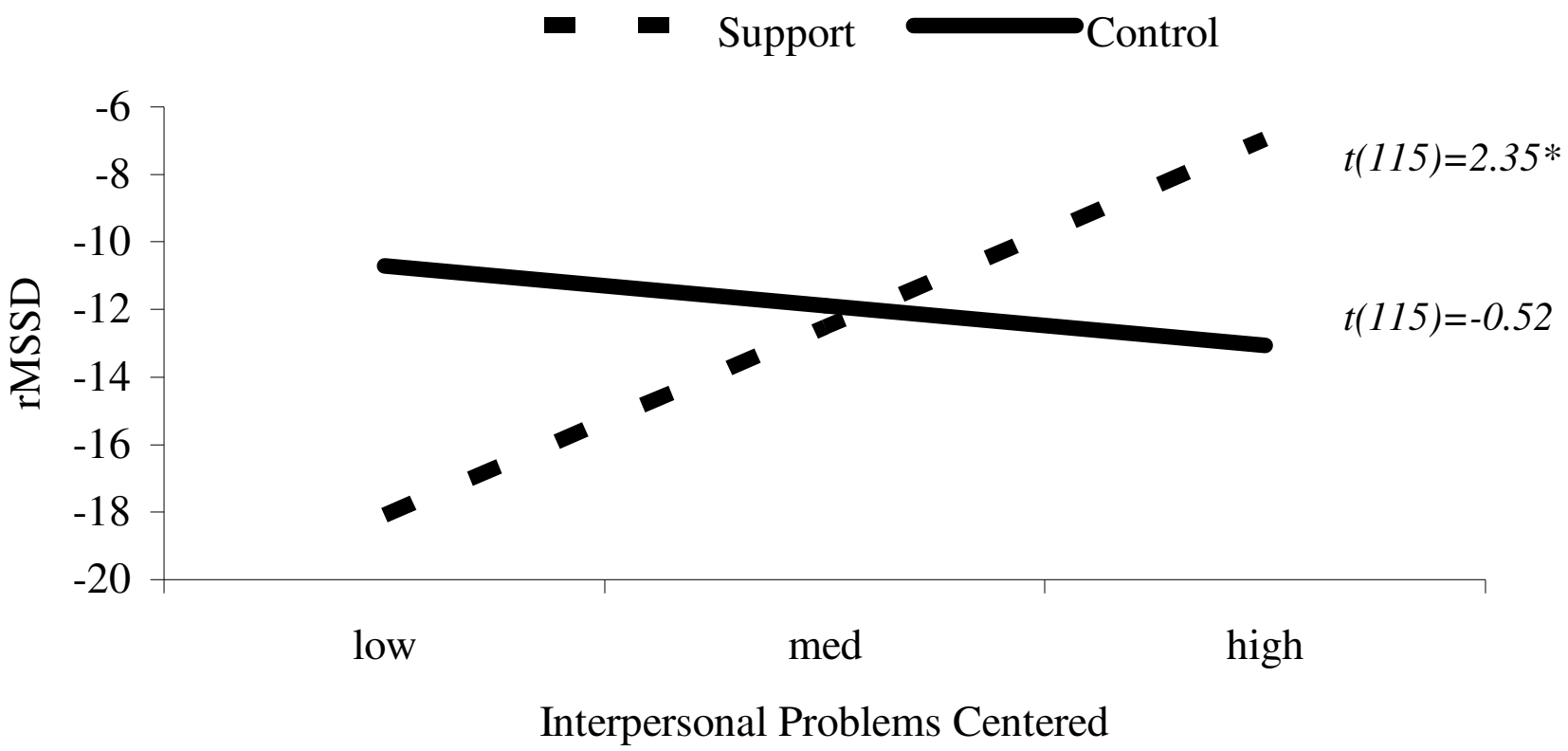

Figure 2. Relationship between interpersonal problems and rMSSD change among adult survivors in the support schema activation versus control group. $p < .05$*

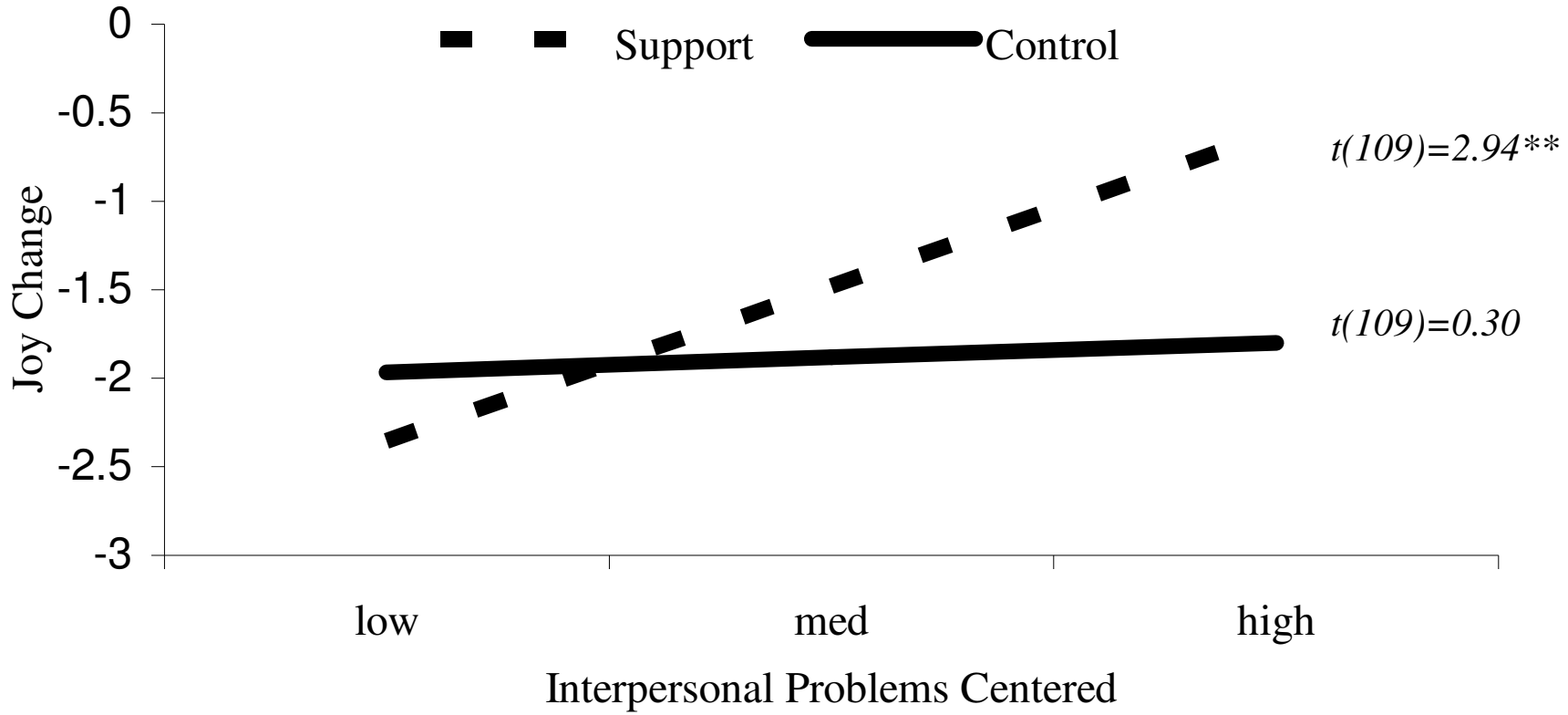

Figure 3. Relationship between interpersonal problems and state joy change among adult survivors in the support schema activation versus control group. $p<.01$**

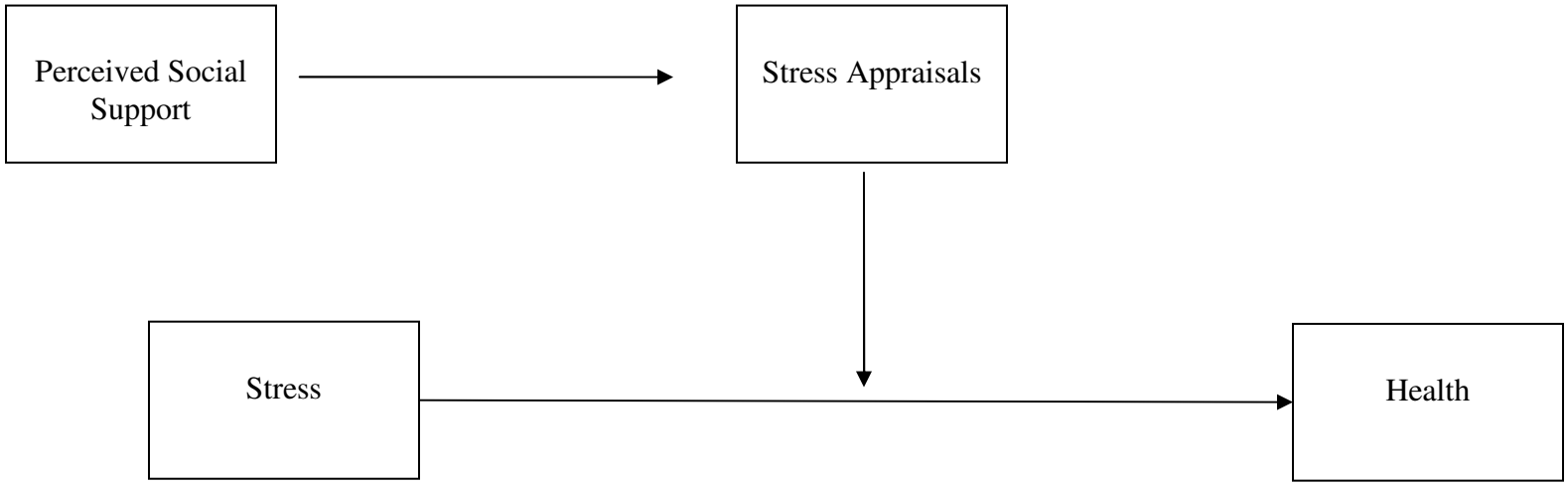

Figure 4. The appraisal perspective predicts that beliefs in the availability of support influence appraisals of stressful situations, which buffer the effects of stress on health outcomes (Lakey and Cohen, 2000; p. 32).

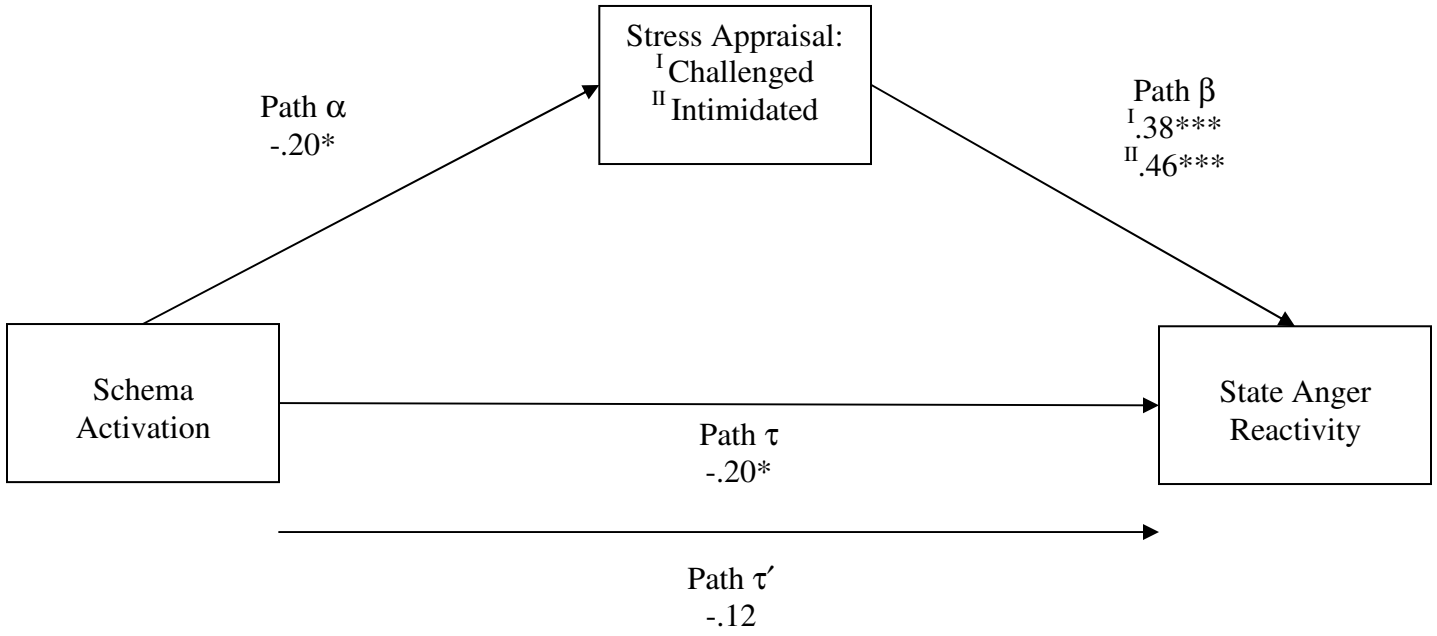

Figure 5. Path diagram for stress appraisal (i.e., challenged and intimidated, respectively) mediation effect on the relationship between schema activation and state anger reactivity. All parameter estimates are standardized regression coefficients (*β*). τ′ is the schema activation direct effect, whereas τ is the indirect effect.