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The 4D-Model of Trauma-Related Dissociation: Validating a Novel Theoretical Framework Through an Attachment-Oriented Approach

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Abstract

A recent framework known as the 4D-Model of Trauma-related Dissociation (Frewen & Lanius, 2014) differentiates between symptoms of clinically significant distress based on whether the symptoms do or do not intrinsically exemplify trauma-related altered states of consciousness (TRASC). Undergraduate students (n = 342) participated in an online survey and completed several measures assessing childhood experiences and psychological symptoms. Female PTSD patients (n = 25) completed similar measures before entering treatment. Within the student sample, NWC symptoms were endorsed as occurring more frequently than TRASC symptoms. On average, symptoms of NWC were more strongly intercorrelated than symptoms of TRASC. Symptoms of TRASC were more strongly correlated with Traumatic Dissociation Scale (TDS) total scores; however, this difference was not significant. The four dimensions of TRASC incremented over the four NWC dimensions in predicting total scores of the TDS, and the reverse was not true. NWC and TRASC symptoms were both weakly correlated with Dissociative Experiences Scale-Brief scores. Although symptoms of TRASC were more strongly correlated with CARTS scores, only the Body dimension (i.e., depersonalization) was significant. Support for the 4D-Model was not as strong within the patient sample. Symptoms of NWC were endorsed as occurring more frequently than TRASC symptoms. However, in contrast to the student sample, symptoms of NWC were not more highly intercorrelated than TRASC symptoms, TRASC symptoms were not correlated stronger with TDS total scores, and TRASC symptoms were not correlated stronger with CARTS subscale scores than were NWC symptoms. Limitations, future directions, and implications are discussed.

Acknowledgement and Dedication

I would like to formally dedicate my thesis to my Honors supervisor Dr. Paul Frewen, for granting me the opportunity to be apart of his innovative research program. This research would not have been possible without his knowledge, insight, guidance, and support throughout the duration of the project. Over the past couple years, Dr. Frewen has encouraged and increased my knowledge in the area of Psychotraumatology, and I am truly grateful for these opportunities. I would like to acknowledge him for the mentorship he has provided to me, and look forward to our continued relationship. Thank-you very much!

In addition, I would like to dedicate my Honors thesis to my father, David Brown, and my mother, Kandyce Brown, for their unwavering emotional, spiritual, and financial support over the duration of my undergraduate career. There have been many ups and downs for all of us along the way, and I am truly blessed to have had both of you alongside me throughout the duration of this process. I am abundantly blessed to be able to call you my Mom and my Dad. Thank-you both very much!

Finally, I would like to dedicate my thesis to the millions of children worldwide who currently or who have previously lived in abusive familial environments, as well as individuals who have endured these familial environments. The experiences that some children and individuals have been forced to endure are certainly beyond my comprehension. In my personal opinion, these individuals represent the very essence of human resilience, and our goal, as a society should be to provide help and support to individuals who have experienced any form of childhood maltreatment. I can only pray that my work helps inform diagnostic, assessment and treatment practices for PTSD, as well as prevention strategies for childhood maltreatment.

The 4D-Model of Trauma-Related Dissociation: Validating a Novel Theoretical Framework Through an Attachment-Oriented Approach

Childhood maltreatment has been linked in psychopathology research to both post-traumatic stress disorder (PTSD) and dissociative disorders. Recently, there has been increased attention to comorbid dissociative symptomatology in people diagnosed with PTSD. This is highlighted by inclusion of the dissociative-subtype of PTSD in the *Diagnostic and Statistical Manual of Mental Diseases* [5th ed.] (DSM-5; APA, 2013; see also Lanius et al., 2010; Lanius, Brand, Vermetten, Frewen, & Spiegel, 2012; Stein et al., 2013; Wolfe et al., 2012). This diagnostic category was created to both recognize and create treatment programs that specifically address the distinct pattern of PTSD symptomatology present in those with high levels of dissociative symptoms. An extensive line of research has documented a relationship between severe abusive childhood experiences and symptoms of dissociation and/or PTSD symptoms (Briere & Runtz, 1990; Lansford et al., 2002; Vranceanu, Hobfoll, & Johnson, 2007). Significantly less research has examined the relationship between dissociation symptoms and/or PTSD symptoms with the relational and interpersonal qualities of traumatic experiences (e.g., feelings the child had about their caregivers, whether the child felt loved by his/her family). In order for an understanding of the relationship between all three variables (i.e., child maltreatment, PTSD symptoms, and dissociation symptoms) it could be argued, based off available evidence, that an integration of both the traumatic experience(s) and the overall relational/interpersonal framework within which these experiences are embedded, is necessary (Ciccheti & Toth, 2005; Frewen et al., 2013).

Dissociation

Spiegel et al. (2011) define dissociation as “an involuntary disruption of the normal integration of conscious awareness and control over one’s mental processes” (p. 826). In general, dissociative symptoms are regarded as potentially affecting all areas of psychological functioning (Spiegel et al., 2013; Spiegel et al., 2011). Furthermore, dissociative symptoms are broken down into two distinct forms: positive and negative (Spiegel et al., 2013). Positive dissociation symptoms are consistent with impromptu and unpleasant intrusions into conscious awareness, with complementary loss of continuity in one’s subjective experience. Negative dissociation symptoms rather, are considered an inability or disruption to access information or to control functioning that otherwise can be accessed or controlled. The dissociative subtype of PTSD recognizes two symptoms of dissociation: depersonalization and derealization (APA, 2013; Spiegel et al., 2013). Depersonalization refers broadly to a state in which a person feels disconnected or detached from the happenings of their own body (APA, 2013). This can refer to perceptual alterations, altered sense of time, emotional or physical numbing, and/or alterations of self (APA, 2013). Derealization refers more specifically to feelings or perceptions that the world is not real, or the environment seeming distorted, dreamlike, or foggy (APA, 2013). The dissociative subtype of PTSD does not recognize certain other symptoms of PTSD that may also be dissociative in nature such as flashbacks, emotional numbing, and hearing voices (Spiegel et al., 2013).

Although there has been debate about the actual process of dissociation since the introduction of the concept to the psychological literature (Dell, 2009), most current researchers on the topic consider dissociation to involve both a “division of consciousness” and a disposition towards the “formation of abnormal states of consciousness” (Cardena, 1994; Frewen & Lanius, 2014; Holmes, et al., 2005; Steele, Dorahy, van der Hart, & Nijenhuis, 2009). However, several

authors have noted that the term “dissociation” is used too broadly, in reference to many diverse yet clinically relevant symptom presentations, as well as to experiences and processes that are considered normative. Accordingly, there is a great deal of confusion surrounding the term (Cardena, 1994; Holmes et al., 2005). Due to this confliction in the literature, there have been many attempts to organize and structure the phenomena of dissociation to provide greater clarity of the construct, as well as to better inform diagnostic and treatment practices.

As a starting point, Waller, Putnam, and Carlson (1996) distinguished between a taxon of pathological dissociation and a non-pathological form of trait dissociation considered to be along a continuum in the population. Elements of pathological dissociation are considered to be representative of symptoms within the dissociative disorders, as well as related disorders such as PTSD, and somatization disorder (Waller, Putnam, & Carlson, 1996). Building on the findings from the dissociative taxon, Holmes and colleagues (2005) also reviewed literature pertaining to forms of pathological dissociation and differentiated between symptoms of dissociation indicative of either “detachment” (i.e., an altered state of consciousness characterized by a sense of separation from certain aspects of everyday experience, be it their body, their sense of self, or the external world) or “compartmentalization” (i.e., a deficit in the ability to control processes or actions that would normally be amenable to such control). They suggest that these two symptoms represent qualitatively distinct types of dissociation that can manifest in isolation of each other (e.g., detachment being prevalent in presentations of PTSD, and compartmentalization characterizing conversion symptoms). Of note, however, Holmes and colleagues recognize that there may be particular conditions in which distinguishing between these two forms of dissociation may be difficult; in particular, they note this distinction may be difficult within PTSD. Specifically, Holmes and colleagues suggest that the phenomena of flashbacks are

exemplary of detachment. However, flashbacks have also been noted in the literature to occur with a lack of context and arise seemingly without intention (Mansell, 2000; Michael et al., 2005), which is consistent with the category of compartmentalization. Therefore, greater specificity of dissociative symptoms may be necessary for certain forms of psychopathology.

Building from past empirical and theoretical research Frewen and Lanius (2014) have proposed a four-dimensional model (4D-Model) that differentiates states of posttraumatic distress based on whether they intrinsically represent trauma-related altered states of consciousness (TRASC; i.e., dissociation symptoms), or states of normal-waking consciousness (NWC), the latter referring to states of distress, that while clinically significant, are not intrinsically dissociative in nature (see Figure 1). The model is an extension of the phenomenological framework developed by Thompson and Zahavi (2007), which outlined the qualitative properties of human subjectivity or conscious experience. Thompson and Zahavi's (2007) model has four dimensions, which are: 1) temporality (sense of time and memory), 2) narrative (the story-like quality of thought), 3) embodiment (the sense of having, and consciously belonging to a body), and 4) affect (the experience of emotions). The 4D-Model simplifies this structure by characterizing the four dimensions of consciousness as: 1) time, 2) thought, 3) body, and 4) emotion, respectively (Frewen & Lanius, 2014).

A TRASC of *time* is characterized by the experience of flashback memories, which are vivid recollections of past events that are marked by a sense of reliving and re-experiencing the memory as if it were happening in the present (Brewin et al., 2010; Michael et al., 2005). This is in contrast to the NWC experience of intrusive recollections and distressing reminders of past traumatic events. TRASC of *thought* is represented by thoughts that occur in second-person perspective, which is similar to voice hearing (e.g., hearing a voice inside one's head saying,

Figure 1. The 4-D Model of Trauma-related Dissociation

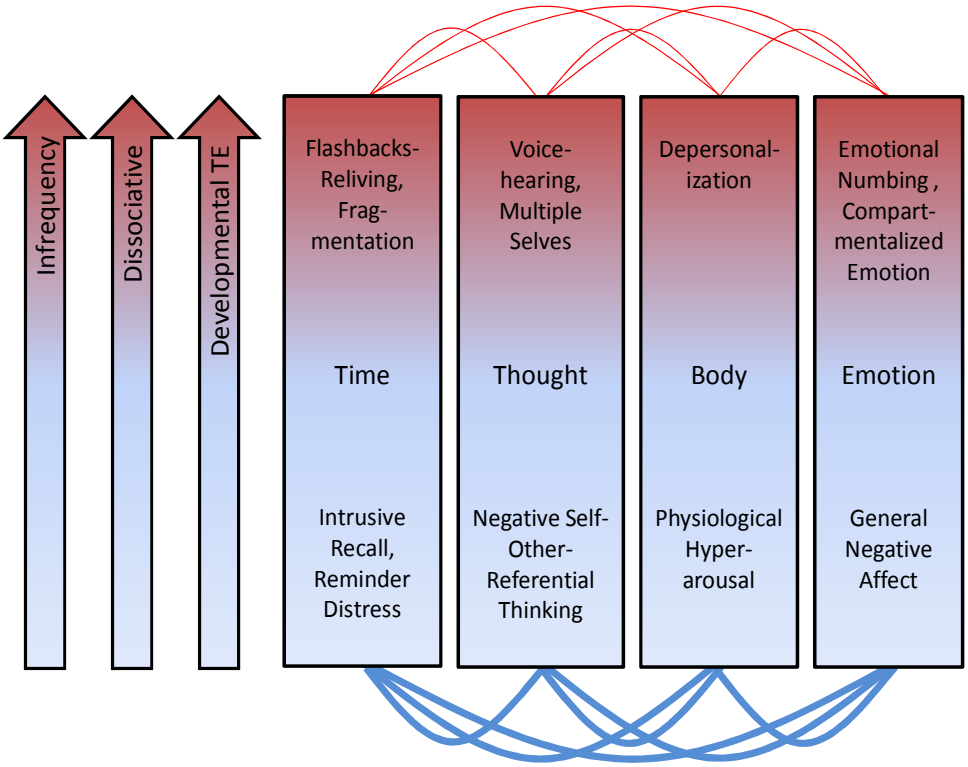

Figure 1. The 4D-Model of Trauma Related Dissociation. NWC symptoms are represented along the bottom of the model in blue, and TRASC symptoms are shown along the top of the model in red. TE = Trauma Exposure. Adapted from "*Healing the Traumatized Self: Consciousness, Neuroscience, Treatment*" by P. A. Frewen and R. A. Lanius, 2014.

"You are worthless"; Dorhary et al., 2009; Longden, Madill, & Waterman, 2012). This is in contrast to having thoughts occurring in the first-person (e.g., thinking to one's self, "I am worthless"), which is considered a symptom of NWC. Depersonalization is considered to be a TRASC of *body* (Harvey & Bryant, 1998), which is differentiated from embodied NWC symptoms (e.g., panic attacks, hyperarousal). Finally, symptoms consistent with experiences of emotional numbing are classified as TRASC of *emotion* (Frewen et al., 2012), as compared to states of more general negative affect in NWC (e.g., fear, guilt, shame; e.g., Wilson, Drozdek, & Turkovic, 2008).

There are additional hypotheses within the 4D-Model. Referring to Figure 1, the 4D-model posits that states of TRASC will be increasingly *infrequent*, that is endorsed less often in terms of frequency or prevalence, when compared to clinical presentations consistent with NWC forms of distress In addition, individuals with presentations congruent with TRASC are predicted to score higher on measures of trait dissociation (represented by arrow labeled "dissociative"). Furthermore, symptoms of TRASC are expected to be more *specific* to repetitive and developmental forms of trauma, whereas symptoms consistent with NWC are expected to be more *sensitive* to maltreatment in general. Finally, the lines connecting the dimensions within the 4D-Model are intended to represent the intercorrelations among the symptoms of TRASC and NWC respectively, from moment-to-moment, in *real* time. The relative boldness of the lines (i.e., NWC symptoms interconnected by bolder lines than TRASC symptoms) exemplifies the hypothesis that at any given moment in time the co-occurrence of any two symptoms of NWC distress will be more likely endorsed than the co-occurrence of any two symptoms of TRASC.

To date, there have been only two studies examining the 4D-Model (Frewen & Lanius, 2014), and as such the current study is in position to replicate and extend these findings, as well

as to provide increasing validity, and greater understanding of the 4D-model. In both studies dissociative symptomatology was assessed via the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986), and NWC and TRASC symptoms were measured by pre-existing items within the testing literature (for specific items see Table 1 in Frewen & Lanius, 2014). In the first study, the 4D-Model was tested in a sample of 504 undergraduate students (75% female). Due to limitations in archived data, only the hypotheses that NWC symptoms will be endorsed more frequently than TRASC symptoms, and the hypothesis that any two NWC symptoms will be more strongly intercorrelated than any two symptoms of TRASC, were tested. Consistent with the predictions of the 4D-Model, symptoms consistent with NWC were endorsed as occurring more frequently over the past month as compared to symptoms of TRASC. In addition, NWC symptoms were more strongly intercorrelated with each other compared to symptoms of TRASC. Moreover, symptoms of TRASC were not strongly intercorrelated with symptoms of NWC supporting the distinction between these two categories.

In another study, Frewen and Lanius (2014) examined the 4D-model in a sample of 74 women who met DSM-IV diagnostic criteria for PTSD. Within this sample, 32 participants (43%) met diagnostic criteria for the dissociative subtype of PTSD in the upcoming DSM-5. Consistent with the predictions of the 4D-Model, NWC symptoms were endorsed as occurring more frequently over the past month as compared to symptoms of TRASC. In addition, any two NWC symptoms were more highly correlated than any two symptoms of TRASC. Also congruent with the 4D-model, between-person symptoms of TRASC were significantly correlated with DES scores. Moreover, multiple regression analyses showed that symptoms of TRASC accounted for significant variance in DES scores after controlling for variance attributable to NWC symptoms, whereas NWC symptoms did not account for a significant

portion of unique variance in DES scores above that accounted for by TRASC. However, generally inconsistent with predictions, Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998) total scores were positively correlated with only one TRASC symptom, voice hearing. No other symptoms of either NWC or TRASC were significantly correlated with CTQ scores.

There are limitations in the two previously discussed studies testing the 4D-model that need to be addressed, in order for further validation of the model. First, due to limitations of archived data, several hypotheses of the 4D-Model could not be tested within the student sample. Of importance, the hypothesis that symptoms of TRASC will be more *specific* to repetitive and developmental forms of trauma was not tested. Additionally, the hypothesis that symptoms of TRASC will be more strongly associated with trait measures of dissociation was not tested. Also untested in the study with the student sample were potential gender differences. The study contained significantly more women (75% of sample) than men (25% of sample), which affects the potential generalizability of the results to men. Examining whether the 4D-Model is consistent across gender will be invaluable for future studies, especially ones testing the model in mixed gender samples of PTSD patients. Within the previous study of PTSD patients, only female participants were tested, and unfortunately the current study will not be able to extend these findings to male PTSD patients. However, one limitation of the previous PTSD patient study was that the hypothesis that repetitive and developmental trauma would be more specific to symptoms of TRASC was only examined via the short-form of the CTQ. Although the CTQ is a well-established, reliable, and valid measure of childhood trauma (Baker & Maiorino, 2009), it may not be the best available measure for “developmental trauma”, and it may not be as “all-encompassing” a measure for repetitive and developmental trauma in the extant literature.

Dissociation, Mentalizing, and Exposure to Domestic Violence

Mentalizing. Research in PTSD, and more specifically dissociation, is continually recognizing the inherent relational nature of childhood maltreatment exposure (Dutra, Bianchi, Siegel, & Lyons-Ruth, 2009). This burgeoning literature base is built off of Bowlby's (1977, 1980, 1988) attachment theory in which he posited that children enter the world with an inherent motivational attachment system that, when confronted with pain, threat, or fear, becomes activated causing the child to approach their attachment figure(s) for comfort, security, and warmth. Over time, the child develops internal working models, which organize beliefs and expectations of the self, others (e.g., attachment figures), and the world into a coherent structure of memories and experiences (Bowlby, 1980). In the case of the child who is chronically maltreated these internal working models can become disorganized due to containing conflicting information regarding the parent being both a protector of the self, and also the self as being a victim of their protector. The definition of "internal working model" is one that is inherently *relational*, construing not only information about beliefs and expectations of the self, but also beliefs and expectations of the self in relation to others.

This conceptualization of attachment as a relational process is congruent with the increased emphasis on social cognitive frameworks, and internal working models being more similar to cognitive schemas (Dykas & Cassidy, 2011). It is the internal working model that obtains, develops, and organizes attachment relevant information, and subsequently, influences our behaviour towards attachment relevant information. Sharp, Fonagy, and Allen (2012) in their social-cognitive framework for PTSD, state that there are three functions to these cognitive schemas: 1) store information about interpersonal interactions and experiences with attachment figures; 2) form expectations about how the attachment figure(s) will behave in future

interactions; and 3) provides important information about the self in the context of relationships. One way that children utilize and develop internal working models is through a process known as mentalizing. Mentalizing is defined as an individual's ability to ascribe feelings, desires, thoughts, and beliefs to others, and to use this ability to interpret, anticipate, and influence another's behaviour (Sharp et al., 2012). In the case of the child who has been chronically abused there are many ways in which mentalizing capacity or capability can become dysfunctional (Fonagy & Target, 1997). Understanding the thoughts and feelings of an abuser may force the child to construct mentalized states of himself/herself, and himself/herself in *relation* to their abuser that contain painful and threatening information (e.g., may parents hate me, my parents don't want me to be apart of this family). If the child's mentalizing capacity does not become relatively inhibited, these beliefs and perceptions of the self as being unlovable, unwanted, undesirable, and unworthy may persist and continue long past the abuse and undermine perceptions of the self later in life. Furthermore, these negative beliefs and feelings about the self in relation to caregivers may lay the groundwork for intrusive and upsetting reminders of past experiences to interfere with functioning later in life. Negative relational beliefs about the self in relation to abusers may therefore be strongly related with NWC of Time symptoms (i.e., intrusive recollections, and emotional upset at traumatic reminders) and NWC of Thought symptoms (i.e., anxious worrying, feelings of worthlessness).

Exposure to Domestic Violence. Another potential mitigating factor between childhood maltreatment and PTSD, or childhood maltreatment and dissociative symptomatology, is exposure to domestic violence within the family. Domestic violence has been termed diversely in the extant literature, often used interchangeably with witnessing violence between parents or intimate partners (Kitzmann, Gaylord, Holt, Kenny, 2003), witnessing abuse towards siblings

(Teicher & Vitaliano, 2011), and witnessing mother assault (Lehmann, 1997). However, review and meta-analytic research tends to support an increase in externalizing and internalizing behavior and emotional problems in children who are exposed to domestic violence (Evans, Davies, DiLillio, 2008; Kitzmann, et al., 2003; Wolfe, Crooks, Lee, McIntyre-Smith, & Jaffe, 2003). Unfortunately, significantly less research has examined the effects of domestic violence exposure on trauma-related symptoms, including that of dissociation. In three meta-analyses described above (i.e., Evans et al., 2008; Kitzmann et al., 2003; Wolfe et al., 2003), all used fewer than 10 studies examining trauma related symptoms; in addition, all three studies noted that there was significant heterogeneity between studies, which implies caution in interpreting results. All three meta-analyses reported that exposure to domestic violence had small to moderate effects on future trauma symptoms, and that future methodologically sound research was warranted in studying this relationship.

Unfortunately, research examining the effects of domestic violence exposure on trauma symptoms is still relatively understudied compared to experiences of direct maltreatment (i.e., physical, sexual, and emotional abuse). In addition, research frequently uses biased sampling methods (e.g., sampling from women's shelters; e.g., Mertin & Mohr, 2002), does not control for various confounding and/or contextual variables (e.g., the affective environment in which the child is raised; e.g., Spilsbury et al., 2007), or examines effects of domestic violence on different age groups (e.g., preschool children vs. adult retrospective reports; c.f., Levendosky, Huth-Bocks, Semel, & Shapiro, 2002; Dorahy, Lewis, & Wolfe, 2007), which limits conclusions that can be drawn from the literature base. In addition to methodological issues, there are also issues in interpretation of studies due to conflicting findings. For example, Kulkarni, Graham-Bermann, Rauch, & Seng (2011) found in a community sample of women that witnessing interparental

violence as a child alone was not predictive of current or lifetime PTSD while controlling for adult trauma exposure, and experiencing direct childhood abuse. However, experiencing direct childhood abuse *and* witnessing interparental violence was more strongly correlated with current and lifetime PTSD diagnoses than solely experiencing direct childhood abuse. In contrast, Chiung-Tao Shen (2009) found in a sample of college students that both experiencing childhood physical abuse and witnessing interparental violence were related to overall PTSD symptoms; however, there was not a significant difference in PTSD symptoms between those who experienced physical abuse alone when compared to witnessing interparental violence alone. This finding would suggest that witnessing abuse is as significant as directly experiencing physical abuse. Therefore, it is unclear from the literature whether exposure to domestic violence alone has significant predictive utility in assessing future PTSD symptoms, or whether exposure to domestic violence only has an effect in the presence of other direct abusive experiences.

In order to provide clarity around the study of witnessing domestic violence and future PTSD symptoms, Teicher and Vitaliano (2011) examined a more encompassing operationalization of domestic violence: witnessing interparental violence *and* witnessing abuse towards siblings. Teicher and Vitaliano found that witnessing of abuse towards siblings by parents resulted in increased adjusted odds ratios for a host of psychopathological symptoms (i.e., depression, anxiety, somatization, anger-hostility, limbic irritability, and dissociation). In addition, these adjusted odds ratios were comparable to those for experiencing sexual abuse. Of note, witnessing violence towards mother and father did not result in significant adjusted odds ratios for any of the above-mentioned symptoms. Teicher and Vitaliano also found that the level of maternal verbal aggression towards the subject significantly mediated the relationship between psychopathology symptoms and witnessing the abuse of one's mother. In contrast,

witnessing the abuse of siblings was only mediated to a moderate degree by sibling verbal aggression towards the subject, which suggests a larger direct relation between witnessing sibling abuse and future psychopathology symptoms. Therefore, future research must take the effects of witnessing sibling abuse into account in order to provide more comprehensive results of the effects of witnessing domestic violence on trauma symptoms.

The Current Study

There are three main aims of the current study: 1) to provide further validation of the 4D-Model, 2) examine the role that the relational environment and exposure to the abuse of others within the family (e.g., mom, dad, and siblings) has in relation to the 4D-model, and 3) provide validity for a new attachment and relational trauma measure, namely the CARTS. The first aim will be addressed by extending previous research that examined the 4D-model in PTSD patients and in university students (Frewen & Lanius, 2014). Specifically, the present study will examine the validity of the 4D-model and the ancillary hypotheses in: 1) a sample of university students from the undergraduate participation pool, and 2) a sample of traumatized women with a confirmed PTSD diagnosis. The current study will extend findings from past research by addressing several unanswered questions in the empirical validation of the 4-D model. Specifically, a more comprehensive assessment of childhood experiences will be presented to assess the prediction that symptoms of TRASC will be more specific to experiences of developmental and repetitive traumas. To test this hypothesis both the Juvenile Victimization Questionnaire (JVQ; Finkelhor, Hamby, Ormrod, & Turner, 2005) and the Childhood Attachment and Relational Trauma Screen (CARTS; Frewen et al., 2013) will be administered. In addition, gender differences in the structure of the 4D-Model will be assessed within the student sample to provide initial validity of the model in both male and female populations.

Finally, a new measure of trait dissociation (i.e., the Traumatic Dissociation Scale; Carlson, Waelde, Smith, Palmieri, & McDade-Montez, 2011) will be used within the student sample to allow for testing of the hypothesis that symptoms of TRASC will be more highly correlated with scores on measures of dissociation.

The second aim of the study will be addressed by performing several mediation analyses examining the mediating role of "mentalizing negative relational beliefs regarding one's Father" in the relationship between experience of several forms of abuse by one's Father (i.e., emotional, physical, sexual abuse, witnessing abuse of Mother by Father, and witnessing abuse of Siblings by Father) and current experiences of NWC and TRASC symptoms. Finally, the third aim of the study will be assessed by computing correlations between various subscales of the CARTS and the Juvenile Victimization Questionnaire, as well as calculations of internal consistency of CARTS scales.

Method

Overview

The current study will test the 4D-Model in two participant samples: undergraduate students, and female PTSD patients. Discussion of the methodology will be divided into two studies. Study 1 describes the measures and procedures used in the sample of PTSD patients. Study 2 pertains to the student sample and the measures and procedures used, therein. The primary reason for this division is the difference in reported participant characteristics, as well as differences in procedure, and minor differences in distributed measures.

Study 1: Traumatized Women

Participants. Thirty-nine (n = 39) women aged 18 to 62 (M = 41.60, SD = 14.53) who met diagnostic criteria for PTSD as assessed by the Clinician Administered PTSD Scale (CAPS; Blake et al., 1995) took part in the current study. Some subsequent analyses refer to a subsample

of participants due to incomplete or missing data ($n \geq 25$). Participants were largely Caucasian (83%), and marital status was as follows: single (41%), married/common-law (30%), separated/divorced (26%), widowed (3%). All participants had graduated from secondary school, and a substantial majority had obtained some level of post-secondary education (87%). Several participants were currently working in some capacity (i.e., volunteer or full/part-time employment) at the time of the study (41%).

Participants exhibited varying levels of PTSD symptom severity (CAPS scores ranged from 34 to 128; $M = 85.38$, $SD = 22.43$). Unfortunately, due to missing data, the prevalence of the dissociative subtype of PTSD throughout the entire sample could not be quantified; however, sufficient data was available for a subsample of 25 women. In this subsample, 6 of the twenty-five women (24%) met criteria for the dissociative subtype of PTSD, which is based on endorsement of the depersonalization and/or derealization item(s) of the CAPS (Frequency ≥ 1, Intensity ≥ 2 scoring rule; Weathers et al., 1999). Several participants reported a severe history of childhood maltreatment as assessed by the Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1996), which contains five subscales, each with a maximum score of 25, for a total of 125. Specifically, the distribution of CTQ subscales was as follows: Total (Range: 39-116, $M = 77.33$, $SD = 20.41$), Physical Neglect (Range 5-19, $M = 10.85$, $SD = 4.14$), Emotional Neglect (Range 5-25, $M = 15.82$, $SD = 6.11$), Sexual Abuse (Range 5-25, $M = 16.31$, $SD = 6.98$), Physical Abuse (Range: 5-22. $M = 12.05$, $SD = 5.45$), Emotional Abuse (Range: 5-25, $M = 16.25$, $SD = 5.83$). Participants also evidenced several comorbid psychiatric diagnoses. The most prevalent were: Major Depression (current, $n = 20$, [51.3%], past, $n = 13$, [33.3%]), Social Phobia ($n = 12$ [30.8%]), Generalized Anxiety Disorder ($n = 10$ [25.6%]), Panic Disorder With/Without Agoraphobia ($n = 9$ [23.1%]), Dysthymia ($n = 7$ [17.9%]) and Agoraphobia Without Panic

Disorder (n = 6 [15.4%]. All comorbid diagnoses were assessed via the Structured Clinical Interview for DSM-IV, and all other comorbid disorders occurred in fewer than 10% of cases.

Measures. Symptoms exemplary of trauma-related altered states of consciousness (TRASC) vs. normal waking consciousness (NWC) were operationalized by comparing frequency endorsements of several psychological test items that approximated the dimensions of the 4D-model, 1) Time, 2) Thought, 3) Body, and 4) Emotion. These items were considered to be the best available items from the current literature base to conceptualize variants of the 4D-Model dimensions. These psychological test items were disseminated into eight separate subscales based on, 1) whether they measured symptoms of TRASC or NWC, and 2) whether the items were exemplary of symptoms related to the dimension of time, thought, body, or emotion (see Table 1 for scale content). Inconsistent with the specific hypothesis of the 4D-Model, items were definitive of symptoms at the trait level (e.g., frequency of experiencing symptoms over the past month), rather than symptoms experienced moment-to-moment in *real-time*. This methodology (i.e., examination of trait symptoms) has been supported by previous research as a valid assessment of the 4D-model (Frewen & Lanius, 2014). In order to compare item frequencies between scales (i.e., paired means) it was essential to collaborate items that used the same rating scale (i.e., Likert scales with the same item anchors).

All items composing the various subscales (see Table 1) were adapted from the Perceived Causal Relations (PCR; Frewen, Allen, Lanius, & Neufeld, 2012), which is a 40-item computer-

Table 1. Measures of Posttraumatic Symptomatology Differentiating States of Normal Waking Consciousness (NWC) versus Trauma-Related Altered States of Consciousness (TRASC)

Dimension	NWC Distress	TRASC
Time	Average response to 2 items: 1) "*Intrusive Memories of a Traumatic Event: Unwanted memories about a traumatic event that you have experienced, which may be in the form of thoughts, mental images, and/or perceptions"*, and 2) *"Emotional Upset at Reminder of a Traumatic Event: Becoming very distressed and/or emotionally upset when you are reminded about a traumatic event that you have experienced"*	Response to: *"Flashbacks of a Traumatic Event: Acting or feeling as if a traumatic event that you have experienced in the past is happening in the present. Having the sense that you are actually 'reliving' the event in the present, rather than only remembering the event as it happened in the past."*
Thought	Average response to 2 items: 1) *"Anxious Worrying: Intense anxiety and worrying, about bad/stressful things happening, that is difficult to control/stop"* and 2) *"Feeling Worthless: Extreme negative thoughts about yourself, so much so that you feel worthless (that you have no value, are useless, are not good for anything at all)"*	Response to: *"Hearing Voices Inside Your Head: Hearing voices inside your head that seem to be different from your own voice and/or different from your own thoughts."*
Body	Response to: *"Panic Attacks: Suddenly feeling very fearful/anxious and developing a lot of physical symptoms, for example, heart racing/pounding, sweating, trouble breathing, nausea, dizziness."*	Response to: *"Depersonalization: A change in the way you perceive or experience yourself, so that you feel detached or separated from (or an outside observer of) yourself, your thoughts, and/or your body."*
Emotion	Average response to 4 items: 1) *"Depressed*	Response to: *"Emotional Numbness: Significantly*

	Mood: Feeling very depressed or down, such as feeling extremely sad or hopeless", 2) *"Irritability/Anger: Feeling extremely irritable or showing strong outbursts of anger toward others (verbally or physically or both)"*, 3) *"Feeling Guilt: Feeling guilty about things that you have done, failed to do, or have happened to you (feeling at fault, blaming yourself)"*, 4) *Feeling Shame: "Intense feelings of shame. Feeling that, in both your own eyes as well as in the eyes of others, that you are bad, disgusting, dirty, dishonored, or defiled."*	*reduced ability to feel emotions; feeling like you are emotionally numb."*

Table 1. Items used to characterize the four dimensions of the 4D-model 1) Time, 2) Thought, 3) Body, and 4) Emotion. All items were adapted directly from the Perceived Causal Relations (Frewen, Allen, Lanius, & Neufeld, 2012). All items include a symptom followed by the DSM definition of that symptom. *Note*: Within the traumatized women sample the items Guilt and Shame were combined as one item due to limitations of archived data.

based self-report scale designed to measure all symptoms of a major depressive episode, all but one symptom of PTSD, four symptoms of anxiety disorders, and various psychological difficulties that co-occur with these diagnoses (e.g., substance abuse, and self-harm; Frewen, Schmittmann, Bringmann, & Boorsboom, 2013). The PCR is composed of six subscales: Anxiety, PTSD, Major Depression, Dissociation, Impairment, and Other. Response options range from 0 (*Not at all*) to 7 (*Daily/Almost daily for most of the day)*. Past research using the PCR has found that items are psychometrically valid (i.e., item-total correlations, inter-item correlations, and convergent and discriminant validity of separate subscales; Frewen et al., 2012). Previous research has indicated that internal consistency of Anxiety, PTSD, and Major Depression is high, considering scale length (α values range from .77-.93; Frewen et al., 2012).

Scale reliabilities were calculated only for NWC Time (α = .66), Thought (α = .67), and Emotion (α = .67) scales, due to all other scales being comprised of a single-item. Internal consistency was low likely due to scale length (i.e., two or three items) and small sample size. Across all subscales, item endorsements will be averaged, as opposed to summed, in order to afford paired tests of means between subscales that have differing numbers of items. These scales will be used to test the hypothesis that symptoms of TRASC will be endorsed less frequently overall compared to NWC symptoms. In addition, the items will be used to test the hypothesis that symptoms of TRASC will be significantly less intercorrelated with each other over time, compared to NWC symptoms.

The Traumatic Dissociation Scale (TDS; see Appendix A; Carlson et al., 2011) will be used to test the hypothesis that symptoms of TRASC will be correlated significantly stronger with measures of trait dissociation than symptoms of NWC. The TDS is a 24-item measure constructed to measure disruptive dissociation experiences occurring over the past week.

Responses are made on a 5-point Likert scale ranging from 0 (*Not at all)* to 4 (*More than once a day*). Total scores range from zero to 96. Disruptive dissociation experiences include depersonalization and derealization (e.g., "I felt like I was outside myself, watching myself do things."), sensory misperceptions (e.g., "I heard something I know really wasn't there."), gaps in awareness filled with re-experiencing (e.g., "I had moments where I lost control and acted like I was back at an upsetting time in my past."), and gaps in awareness or memory (e.g., "I noticed that I couldn't remember the details of something upsetting that happened to me."). Prior research has shown the TDS to have high internal consistency ($\alpha \geq .90$), and expected correlations with PTSD symptoms ($r = .70$-$.80$) and trauma exposure ($r = .20$-$.50$; Carlson et al., 2011). Internal consistency of the TDS in the current study was high ($\alpha = .95$). The TDS was chosen as a measure of dissociation for the current study because it addresses two limitations of existing dissociation measures, 1) only includes items that have a normally distributed population distribution, and 2) does not include items that are endorsed somewhat by all participants. The most commonly used measure of dissociation, the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986), contains items of severe identity dissociation that are rarely endorsed by participants; in addition, the DES contains items that are normative in the population and endorsed by nearly all participants. Finally, the Childhood Attachment Relational Trauma Screen (CARTS; Frewen et al., 2013) was administered to assess the hypothesis that TRASC symptoms will be more strongly correlated with developmental and repetitive forms of trauma, as opposed to, NWC symptoms, which are predicted to correlate significantly with developmental and repetitive trauma, all be it to a lesser degree. The CARTS is a 56-item computer-based self-report measure designed to assess overt instances of childhood maltreatment, as well as the general warmth, security, and supportiveness of individuals within

the respondents' family. The CARTS is composed of several subscales to assess these experiences and the respondents' family environment. Items from the CARTS assess positive relationships within the respondent's family (13-items; e.g., "This person liked me", "I liked this person"), secure attachment and proximity seeking (eight items; e.g., "I went to this person when I was feeling sad or upset"), negative affective traits of family members (three items; e.g., "This person was sad or upset a lot of the time"), and positive affective traits (one item; i.e., "This person was usually happy"). Additional CARTS items assess negative relational feelings from family members (four items; e.g., "This person made me feel sad or upset"), negative relational beliefs experienced from family members (five items; e.g., "I thought that this person did not like me very much."), and negative relational beliefs directed towards other family members (five items; e.g., "I wished that this person was NOT in our family").

The CARTS also contains behaviourally designed scales intended to measure instances of emotional abuse directed towards the respondent (two items; e.g., "This person called me bad names"), towards the respondents' family members (two items; e.g., "This person called people in my family bad names"), physical abuse directed toward the respondent (two items; e.g., "This person slapped, smacked, or hit me."), and towards the respondents' family members (two items; e.g., "This person slapped, smacked, or hit people in my family."), and sexual abuse towards the respondent (e.g., "This person touched my body in places that I did not want them to."). Finally, three items were used to assess abusive experiences occurring, but in a non-behaviourally explicit way (i.e., bad things happening to me; e.g., "This person did bad things to me that I didn't like to talk about or think of"). Research examining the CARTS has found that scales demonstrated acceptable internal consistency considering the small number items included within scales (αs range from .17-.98; Frewen et al., 2013).

The CARTS utilizes a novel assessment methodology that not only assesses "what" happened to the respondent growing up, but also "who" performed that action or behaviour towards the respondent, or towards other people in the respondent's family. The CARTS therefore is in line with research examining the relational-socioecological framework of childhood maltreatment (Cichettii et al., 2005), by assessing not only what happened to the child (e.g., physical abuse), but also who performed this behaviour (e.g., dad was physically abusive, but mom was not), and in what relational context this occurred in (e.g., dad abused me and my older brother, but not my younger sister). Essentially, to complete the CARTS the respondent provides a description (i.e., label) for important figures within their life growing up. In total, up to 11 people may be entered into the program, and each individual is represented by a *black* ink stick figure presented on the screen. Following identification of individuals important in the respondents' life growing up, the CARTS presents specific items (e.g., "I liked this person"), which the participant responds to by clicking on the stick figure(s) for which the item is true. Responses to items are therefore dichotomous (i.e., yes this item is true for this person, or no this item is not true for this person). When a figure/label is clicked on the colour changes from black to red, to indicate that it has been selected for the particular item. Furthermore, if a respondent wishes not to select anyone for a particular item they may click a "Not Applicable" box, and move to the next item. When the respondent has completed a particular item, the "Next" icon is clicked, and a new item is presented, with all figures/labels returning back to the default black ink. For a visual illustration of responses to CARTS items see Figure 2. For descriptive statistics of CARTS scales for Patients consult Table 2.

Procedure. Participants were interviewed by trained diagnosticians, as supervised by Dr. Paul Frewen and Dr. Ruth Lanius. Participants completed the discussed measures as part of a

Figure 2. Illustration of the CARTS Methodology

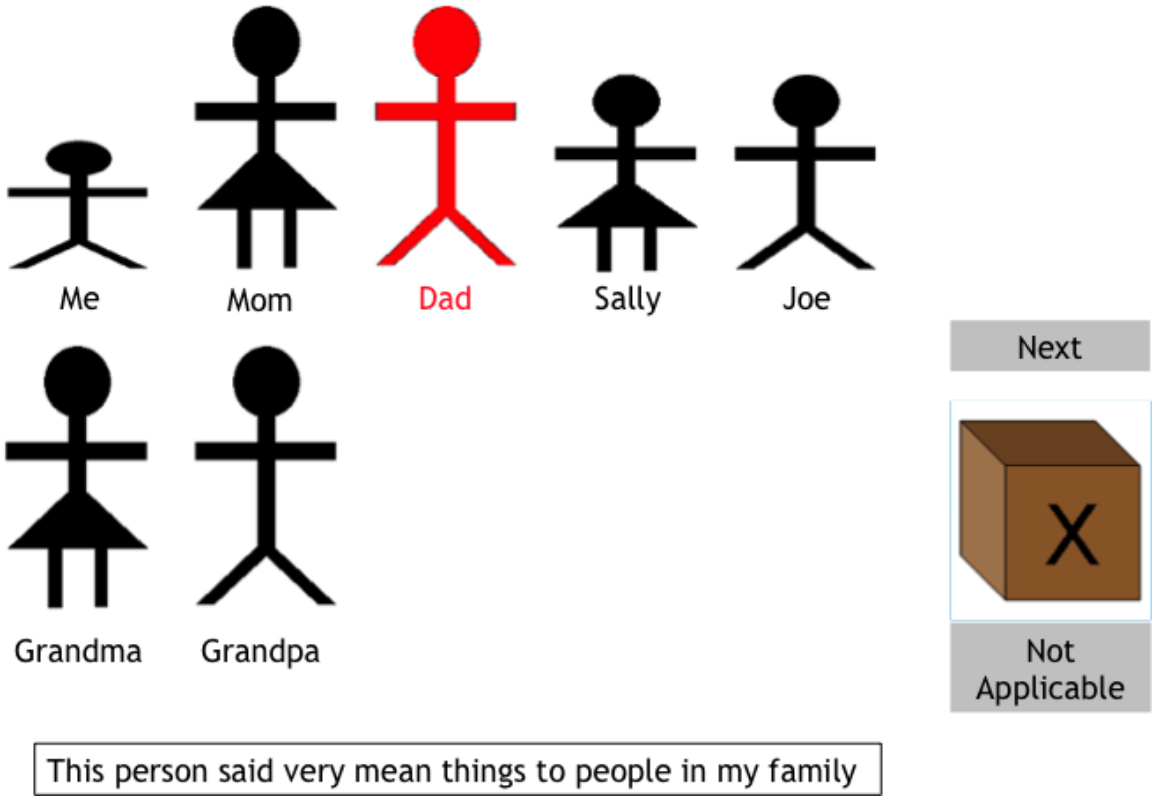

Figure 2. In this example, a respondent has been presented with the test item "This person said very mean things to people in my family", and initially all figures would have been presented in black ink. Since most of the figures and labels in the diagram remain black, this indicates that the respondent (by *not* clicking on the respective figures/labels), when growing up as a child and adolescent, he/she did not say mean things to people in his family, his/her mother did not say mean things, both his/her brother and sister did not say mean things, and that both his/her grandparents did not say mean things. In contrast, by clicking on the label/figure "Dad" the respondent has indicated that his/her Dad did say mean things to other people in his/her family. This is demonstrated by the figure labeled "Dad" turning the colour red. Should the respondent have wished to indicate that no one in his/her family said mean things to other people in the family, he/she would have clicked the brown box labeled "Not Applicable". Clicking the "Next" button would continue the survey bringing up the next item, with all figures returning to the default black ink. Different types of items were presented. For example, with the presentation of an item "This person liked me very much", the respondent may have selected all labels/figures on the screen except for "Dad", which would indicate that the respondent felt everyone in their family liked them except for "Dad".

study examining the effectiveness of a novel psychotherapy for survivors of trauma, namely mindfulness-based therapy. The ethics of this study procedure was approved by an institutional review board.

Study Two: Student Sample

Participants. Undergraduate Psychology students (n = 342; 63% female; M_{age} = 18.47, SD_{age} = 1.64) from Western University completed the current study through the use of the undergraduate participation pool. Most students identified as either of Caucasian (60.6%) or Asian (19.5%) ethnicity. Most students also identified as being currently single (90.8%). In terms of psychiatric diagnoses, 20 participants (5.7%) said that they are currently diagnosed with a psychiatric disorder, and 18 (5.2%) said that they have been diagnosed in the past, but not currently. Students received one research credit for participating in the current study as partial fulfillment of course requirements. There were no exclusionary criteria of participants, and the only inclusion criteria of participants was that they were at least 18 years of age.

Measures. Item subscales used to distinguish NWC from TRASC symptoms were identical for students and PTSD patients for the dimensions of Time, Thought and Body. For the dimension of Emotion, the Guilt/Shame item was broken down into two separate items, which is based on current literature supporting the distinction between social and non-social emotions (refer to Table 1 for item listing; Frewen et al., 2010; Hareli & Parkinson, 2008; Kim, Talbot, & Cicchetti; 2009). In addition, the Traumatic Dissociation Scale (TDS) was used to measure symptoms of dissociation (see Measures section of Study 1 for discussion of TDS). However, within the undergraduate sample a unique assessment measure of childhood maltreatment was administered, as well as a modified version of the Childhood Attachment Relational Trauma

Screen (CARTS). See Table 2 for descriptive statistics of all measures administered in the student sample, with the exception of the CARTS.

The Juvenile Victimization Questionnaire – Adult Retrospective (JVQ-AR; Hamby, Finkelhor, Ormrod, & Turner, 2004) was administered in order to assess, in part, the hypothesis that symptoms of TRASC will be more highly correlated with developmental and repetitive forms of trauma exposure. The JVQ is a 34-item measure designed to assess a broad range of victimizing experiences individuals can experience throughout childhood. These experiences include not only childhood maltreatment, but also experiences of criminal victimization (e.g., robbery), sexual assault, bullying and witnessing violence. Responses to the JVQ-AR items are based on frequency and/or severity of victimization experiences, with responses ranging on a 6-point Likert scale anchored from 0 (*No*) to 5 (*5 times or more*). The JVQ-AR often is delineated into five subscales (i.e., Conventional Crime, Child Maltreatment, Peer and Sibling Victimization, Sexual Victimization, and Witnessing Violence), which have demonstrated adequate reliability in previous research (α values range from .35-.70; Finkelhor, Hamby, Ormrod, & Turner; Richmond, Elliot, Pierce, Aspelmeier, & Alexander, 2009). Although reliability is not uniformly high, this is expected due to the fact that each item of the JVQ-AR measures a different victimization experience, as opposed to a larger theoretical psychological construct (i.e., to increase internal consistency, all items are assumed to be randomly parallel and measure the same construct). The inclusion of non-parallel items (i.e., items with dissimilar content) is justified based on several lines of research demonstrating that it is the cumulative effect of many victimization experiences that contributes to future psychological distress, compared to a single type of victimization experience (e.g., sexual abuse; Elliott, Alexander, Pierce, Aspelmeier, Richmond, 2009; Finkelhor et al., 2005; Richmond et al., 2009).

Table 2. Descriptive Statistics for Scales Administered to Student Sample Excluding the CARTS

	Mean (Standard Deviation)	Standard Error (*SE*)	Coefficient Alpha (α)
JVQ Scales			
JVQ Conventional	5.94 (7.49)	.45	.87
JVQ Maltreatment	1.54 (3.23)	.20	.79
JVQ Peer/Sibling Victimization	4.45 (5.13)	.31	.75
JVQ Sexual Victimization	2.08 (4.35)	.26	.87
JVQ Witness	3.24 (6.79)	.41	.91
TDS Total	6.62 (11.57)	.67	.98
DES-B Total	2.93 (3.50)	.26	.75
NWC and TRASC symptoms			
NWC Time	.72 (1.16)	.06	.80
NWC Thought	1.57 (1.63)	.09	.73
NWC Body	.96 (1.52)	.08	-
NWC Emotion	1.39 (1.40)	.08	.87
TRASC Time	.52 (1.30)	.07	-
TRASC Thought	.25 (.92)	.05	-
TRASC Body	.45 (1.15)	.06	-
TRASC Emotion	1.09 (1.60)	.08	-

The JVQ-AR was added to the current assessment survey mainly due to the fact that responses are based on frequency of occurrence, which is not assessed by the CARTS. Assessment of frequency and severity of experiences will allow for a more comprehensive examination of the developmental and repetitive trauma hypothesis of the 4D-model. In addition to the inclusion of the JVQ-AR, a modified version of the CARTS was added to the assessment survey in the student sample. The modified CARTS contained eight additional items that were included solely for the purpose of assessing "Exposure to Domestic Violence" within the family (see Appendix B). The assessment methodology of the CARTS allows for comprehensive examination of domestic violence by measuring not only violence between parents, but also violence directed towards siblings. These additional items are based on previous research examining the witnessing of domestic violence within families (Teicher & Vitaliano, 2011). For descriptive statistics of the CARTS scales see Tables 3 and 4.

Procedure. Students completed the survey of the current study The measures were presented in the order, 1) CARTS, 2) Causal Symptoms Checklist, 3) Traumatic Dissociation Scale, 4) Juvenile Victimization Questionnaire, and 5) The Dissociative Experiences-Brief Version. Following completion of the survey participants were given some information about the study as well as a debriefing form to read.

Results

Study 1: Traumatized Women

Mean frequency endorsement, NWC > TRASC. Comparison of the mean frequency ratings obtained for the NWC vs. TRASC symptoms for each dimension of the 4D-model were calculated using paired samples *t*-tests (a Bonferroni correction was applied to attenuate Type I error, $p = .05/4 = .0125$). Throughout all analyses, TRASC of Thought (i.e., voice hearing) had

zero variance, and therefore could not predict variance. Consistent with predictions, NWC symptoms were endorsed as occurring more frequently than symptoms of TRASC for the dimensions of Time, $t(29) = 8.47$, $p < .001$; Thought, $t(29) = 11.07$, $p < .001$; and Body, $t(29) = 5.32$, $p < .001$. However, inconsistent with hypotheses, symptoms of NWC were not endorsed more frequently than TRASC symptoms for the dimension of Emotion, $t(29) = 1.55$, *ns*.

Symptom dimensions of TRASC will be less intercorrelated than NWC symptoms. Pearson bivariate correlations were computed to test the hypothesis that any two symptom dimensions of NWC will be more strongly intercorrelated than any two symptom dimensions of TRASC. Inconsistent with predictions, any two symptoms of NWC were not more highly intercorrelated with each other, compared to any two symptoms of TRASC. Furthermore, NWC symptoms were not more strongly intercorrelated on average (Range: $.23 \leq r \leq .79$, $M_r = 49$, $SD_r = .18$), than symptoms of TRASC (Range: $.54 \leq r \leq .57$, $M_r = .55$, $SD_r = .01$). In addition, also inconsistent with hypotheses, symptoms of TRASC were correlated significantly, on average with symptoms of NWC (Range: $.16 \leq r \leq .76$, $M_r = .50$, $SD_r = .19$).

Symptoms of TRASC more highly correlated with trait measures of dissociation. Consistent with predictions, between-person variability in experiencing TRASC symptoms was significantly correlated with Traumatic Dissociation Scale (TDS) scores (Range: $.50 \leq r \leq .55$, $M_r = .53$, $SD_r = .03$), compared to symptoms of NWC (Range: $.35 \leq r \leq .57$, $M_r = .44$, $SD_r = .10$). Inconsistent with predictions, TRASC symptoms were unable to incrementally predict variance in TDS scores over NWC symptoms, in a two-step multiple regression analysis using the enter method, $F(7, 22) = 2.54$, $p < .05$, ($\Delta R^2 = .09$, total $R^2 = .45$, *ns*). However, consistent with predictions, symptoms of NWC were unable to increment prediction of TDS variance above symptoms of TRASC, $F(7, 22) = 2.54$, $p < .05$, ($\Delta R^2 = .05$, total $R^2 = .45$, *ns*).

Symptoms of TRASC will be endorsed more often by repetitively traumatized persons, especially those with more extensive histories of abuse and neglect. Between-person variation in Childhood Trauma Questionnaire (CTQ) total scores was not significantly correlated with any symptom of TRASC. Moreover, there were no significant correlations between CTQ total scores and any symptom of NWC. Analyses utilizing the CARTS Box (Not Applicable), Self, Biological Mother, Biological Father, One Brother, Multiple Brothers, One Sister, and Multiple Sisters subscales did not reveal any significant correlations with symptoms of TRASC (see Table 2 for CARTS reliability and scale descriptive statistics).

Additional Analyses. A significant positive correlation was found between scores on the Self Proximity-Seeking subscale of the CARTS and TDS total scores, $r(23) = .66$, $p < .001$. A partial correlation was computed between Self Proximity-Seeking and TDS scores, holding, constant the Box, Biological Mother, and Biological Father Proximity-Seeking subscales of the CARTS to determine if the relationship between dissociation and Self Proximity-Seeking is a true effect, or primarily driven by a lack of secure attachment to Mom or Dad. The results suggest that total scores on the TDS are positively related to Self Proximity-Seeking, $r(20) = .68$, $p < .001$.

Study 2: Students

Mean frequency endorsement, NWC > TRASC. Comparison of the mean frequency ratings obtained for NWC vs. TRASC symptoms for each dimension of the 4D-Model can be seen in Figure 3 (blue vs. red bars, respectively), and all comparisons were analyzed using paired samples *t*-tests (correction for Type I error *p*'s = .05/4 = .0125). Consistent with hypotheses of the 4D-model, NWC symptoms were endorsed significantly more on average than TRASC

Figure 3. Mean Frequency Endorsement of NWC and TRASC symptoms: Students

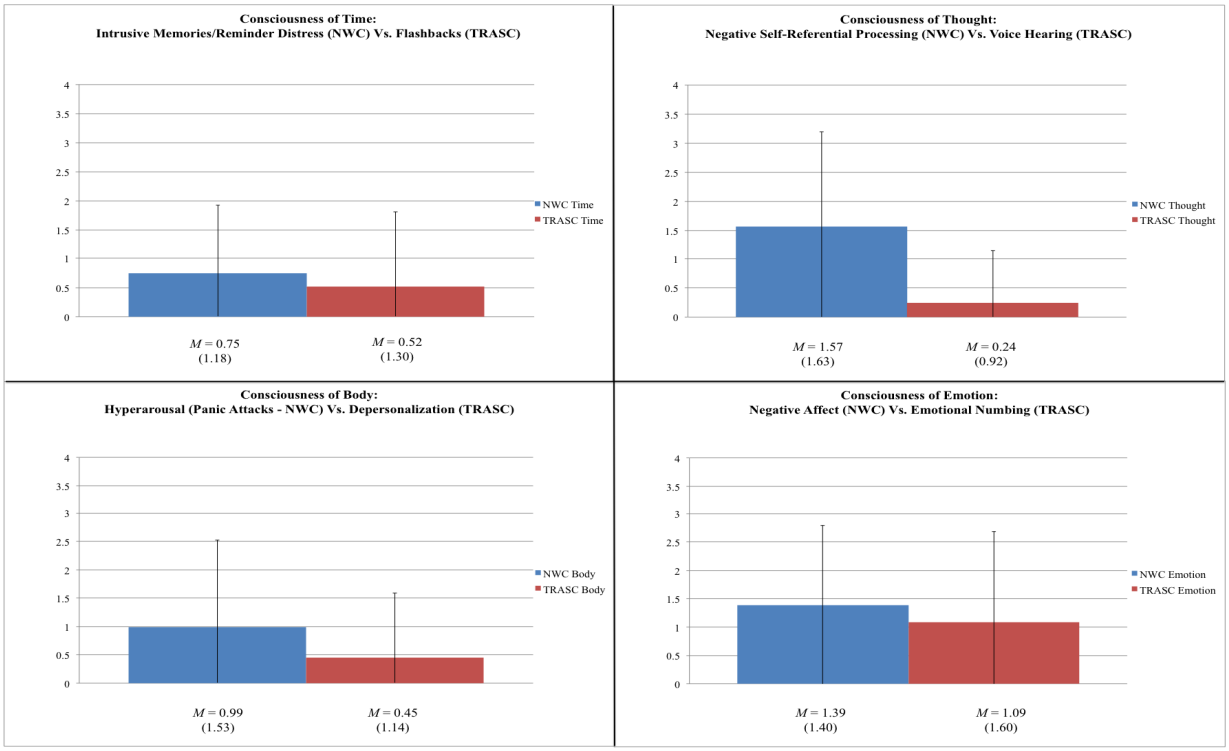

Figure 3. Mean frequency endorsement of NWC symptoms (blue) and TRASC symptoms (red) over the past month. Standard deviations are shown in brackets, and represented by error bars. Labels for specific item endorsement are as follows: 0 = Not at All, 1 = Once, 2 = Two or Three Times, 3 = About Once per Week, 4 = About Two to Three Times per Week. All t-tests were are significant at $p < .05$.

symptoms for the dimensions of Time, $t(327) = 3.32$, $p < .001$; Thought, $t(327) = 14.15$, $p < .001$; Body, $t(327) = 5.35$, $p < .001$; and Emotion, $t(327) = 4.62$, $p < .001$.

Symptom dimensions of TRASC will be less intercorrelated than NWC symptoms. Consistent with predictions of the 4D-model, symptoms of NWC were more highly intercorrelated (Range: $.51 \leq r \leq .83$, $M_r = .64$, $SD_r = .11$) compared to symptoms of TRASC (Range: $.22 \leq r \leq .69$, $M_r = .49$, $SD_r = .16$). In addition, TRASC symptoms were not as strongly correlated with NWC symptoms, on average (Range: $.25 \leq r \leq .79$, $M_r = .46$, $SD_r = .13$), although emotional numbing and depersonalization were generally more strongly correlated with NWC symptoms of distress than were voice-hearing and flashbacks. Inconsistent with predictions of the 4D-Model, *any* two symptoms of NWC were not more highly intercorrelated than *any* two symptoms of TRASC (see Figure 4).

Symptoms of TRASC more highly correlated with trait measures of dissociation. Also consistent with the 4D-model, between-person variation in the experience of TRASC forms of distress was significantly correlated with TDS scores (Range: $.40 \leq r \leq .46$, $M_r = .43$, $SD_r = .03$). In addition, in a multiple regression analysis using the enter method, the four dimensions of TRASC symptoms incremented over the four dimensions of NWC symptoms in accounting for variance in TDS scores, $F(8, 285) = 35.33$, $p < .001$. Contrary to expectations, the four symptom dimensions of NWC distress significantly incremented prediction of TDS variance over the four symptom dimensions of TRASC, $F(8, 285) = 39.20$, $p < .001$.

For the Dissociative Experiences Scale-Brief (DES-B), only TRASC of Body and TRASC of Emotion were significantly correlated with total scores, all other symptoms of NWC and TRASC were non-significantly related. As such, multiple regressions did not suggest that either NWC distress or TRASC incremented in prediction of DES-B total scores.

Figure 4. NWC (Blue) and TRASC (Red) Dimension Intercorrelations

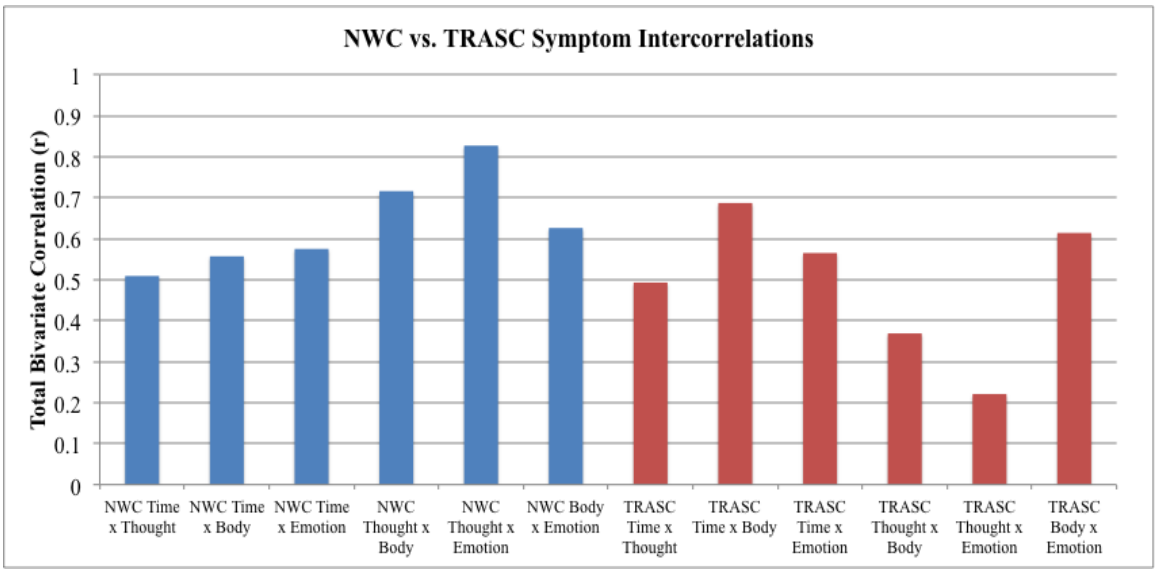

Figure 4. All possible intercorrelations of NWC (blue) and TRASC symptom dimensions (red) respectively. Overall, NWC symptoms were more strongly intercorrelated (M_r = .64, SD_r = .11) than TRASC symptoms (M_r = .56, SD_r = .21).

Symptoms of TRASC will be endorsed more often by repetitively traumatized persons, especially those with more extensive histories of abuse and neglect. An extensive number of significant bivariate correlations were found between scores on the CARTS subscales and symptoms of NWC and TRASC (see Tables 3-4 for CARTS descriptive statistics). For ease of interpretation Figures 5-9, show all bivariate correlations between various CARTS subscales (i.e., Box, Mom, Dad, One Brother, and One Sister) and symptoms of NWC and TRASC. Critical *r*-values were calculated based on an $\alpha = .01$ and a sample size corresponding to the number of participants who listed various family members. It is important to note that the critical *r*-value does not correspond to the *p*-value for significant correlations following a Bonferroni correction; however, the critical *r*-value was chosen to be particularly stringent, so that any correlations reaching a significant *r*-value, will also meet the criteria imposed by the Bonferroni correction. One Sister and One Brother subscales were calculated based on participants who endorsed only having one sister and/or one brother. Participants who endorsed multiple siblings of a given gender were not included in these analyses.

JVQ total scores were positively correlated with all symptom dimensions of NWC (Range: $.23 \leq r \leq .41$, $M_r = .34$, $SD_r = .07$) and TRASC (Range: $.34 \leq r \leq .44$, $M_r = .39$, $SD_r = .04$), and all were highly significant (i.e., all p's $< .001$). For the five individual subscales of the JVQ the correlations were much more modest (see Table 5). The Witness subscale was the only subscale to have a significantly higher mean correlation (i.e., $p < .05$) with TRASC symptoms (Range: $.24 \leq r \leq .44$, $M_r = .36$, $SD_r = .07$) compared to NWC symptoms ($.13 \leq r \leq .30$, $M_r = .23$, $SD_r = .06$).

Negative Mentalization. Several mediation analyses were run in order to examine whether mentalizing negative beliefs from your Father was a significant mediator of abusive

Table 3. Means, Standard Deviations, and Reliability of CARTS Box, Self, Biological Mother, and Biological Father subscales

	Not Applicable (Box)			Self			Biological Mother			Biological Father			Correlations		
Subscale (No. of items)	α	*M*	*SD*	α	*M*	*SD*	α	*M*	*SD*	α	*M*	*SD*	r_{bc}	r_{bd}	r_{cd}
Positive (13)	.74	.21	.79	.92	2.17	3.36	.88	11.31	2.70	.91	10.29	3.59	.21*	.21*	.55*
Proximity-Seeking (8)	.80	.49	1.45	.85	.47	1.50	.81	6.09	2.65	.81	4.40	3.03	-	-	.49*
Fails To Help (4)	.85	1.55	1.33	-	.50	.67	.29	1.22	.94	.85	1.21	.91	-	-	.48*
Positive Affect (1)	-	.51	.50	-	.31	.46	-	.67	.47	-	.66	.47	.19*	.25*	.51*
N-Affect (3)	.64	.99	.97	.54	.21	.55	.80	.57	.89	.68	.54	.89	.08	.14	.45*
N-Feelings From (5)	.86	1.69	1.38	-	-	-	.72	.70	1.22	.85	.92	1.38	-	-	.43*
N- Beliefs From (5)	.90	3.82	1.70	-	-	-	.72	.20	.72	.91	.35	1.09	-	-	.18*
N-Beliefs To (5)	.86	4.09	1.63	-	-	-	.69	.15	.69	.88	.28	.94	-	-	.15
E-Ab to Self (2)	.65	1.16	.85	-	-	-	.61	.18	.50	.78	.20	.54	-	-	.40*
E-Ab to Others (2)	.72	1.33	.83	.84	.07	.35	.78	.16	.50	.85	.22	.58	.27*	.25*	.47*
P-Ab to Self (2)	.63	1.48	.74	-	-	-	.72	.19	.45	.44	.20	.47	-	-	.57*
P-Ab to Others (2)	.69	1.55	.73	.74	.04	.24	.77	.09	.34	.67	.12	.41	.01	-.01	.46*
Wit-Violence By Mother (1)	-	.87	.34	-	-	-	-	-	-	-	.03	.18	-	-	-
Wit-Violence By Father (1)	-	-	-	-	-	-	-	.07	.25	-	-	-	-	-	-

Wit-Violence By Siblings (2)	.66	1.77	.55	.61	-	-	.70	.04	.25	-	.02	.12	-	-	-
Wit-Violence To Mother (1)	-	.92	.28	-	-	-	-	-	-	-	.07	.26	-	-	-
Wit-Violence To Father (1)	-	.84	.36	-	-	-	-	.04	.20	-	-		-	-	-
Wit-Abuse To Siblings (2)	.83	1.84	.50	.35	-	-	.68	.06	.29	.42	.05		-	-	-
Bad Things (3)	.86	2.80	.66	-	-	-	.71	.05	.31	.84	.05	.02	-	-	.54*
S-Ab (6)	.96	5.75	1.08	-	-	-	.53	.04	.41	.97	.05	.03	-	-	-.01

Table 3. Ab = abuse, E = emotional, N = negative, P = physical, S = sexual, Wit = witness, bc = intercorrelations between self and mother scales, bd = intercorrelations between self and father scales, cd = intercorrelations between mother and father scales. *Note*: * signifies a significant bivariate correlations between the given two scales of the CARTS.

Table 4. Means, Standard Deviations and Reliability of Brother and Sister Subscales of CARTS

	Brother			Sister			Correlations
Subscale (No. of items)	α	*M*	*SD*	α	*M*	*SD*	*r*
Positive (13)	.85	7.56	3.26	.85	8.16	3.48	.75*
Proximity-Seeking (8)	.82	1.76	2.33	.87	3.02	3.11	.60*
Fails To Help (4)	.70	.99	.65	.37	1.06	.98	.06
Positive Affect (1)	-	.16	.37	-	.22	.42	.20
Negative Affect (3)	.84	.85	.54	.81	.70	1.09	.13
N-Feelings From (5)	.76	.74	1.12	.74	.34	.84	.34
N- Beliefs From (5)	.78	.31	.90	.71	.35	.88	.34
N-Beliefs To (5)	.80	.30	.90	.68	.32	.85	.79*
E-Ab to Self (2)	.61	.38	.67	.69	.21	.58	.15
E-Ab to Others (2)	.60	.19	.52	.72	.14	.50	-.04
P-Ab to Self (2)	.65	.30	.61	.55	.04	.23	.10
P-Ab to Others (2)	.58	.14	.44	.60	.03	.21	.04
Wit-Violence By Mother (1)	-	.11	.32	-	.10	.30	.65*
Wit-Violence By Father (1)	-	-	-	-	.13	.33	-
Wit-Violence By Siblings (2)	-	.09	.32	-	.06	.25	.89*
Wit-Abuse To Mother (1)	-	.03	.18	-	.02	.16	-.03
Wit-Abuse To Father (1)	-	-	-	-	.01	.09	-
Wit-Abuse To Siblings (2)	-	.05	.22	-	.03	.21	.41*
Bad Things (3)	-	.03	.16	1.00	.03	.28	-.03
S-Abuse (6)	.17	.86	.42	.58	1.56	.76	.48*

Table 4. Ab = abuse, E = emotional, N = negative, P = physical, S = sexual, Wit = witness, * = significant bivariate correlations between a given brother and sister subscale.

Figure 5. Correlations of CARTS Box Subscales and Symptoms of NWC and TRASC

Figure 5. Total bivariate correlations between CARTS Box subscales and symptoms of NWC (Blue) and (TRASC). Emot = Emotional, Neg = Negative, Phys = Physical, Pos = Positive, Wit = Witness. Black lines represent critical-*r* value (r_{crit} = .134) for significant correlations (n = 300, p = .01).

Figure 6. Correlations of CARTS Biological Mother Subscales and Symptoms of NWC and TRASC.

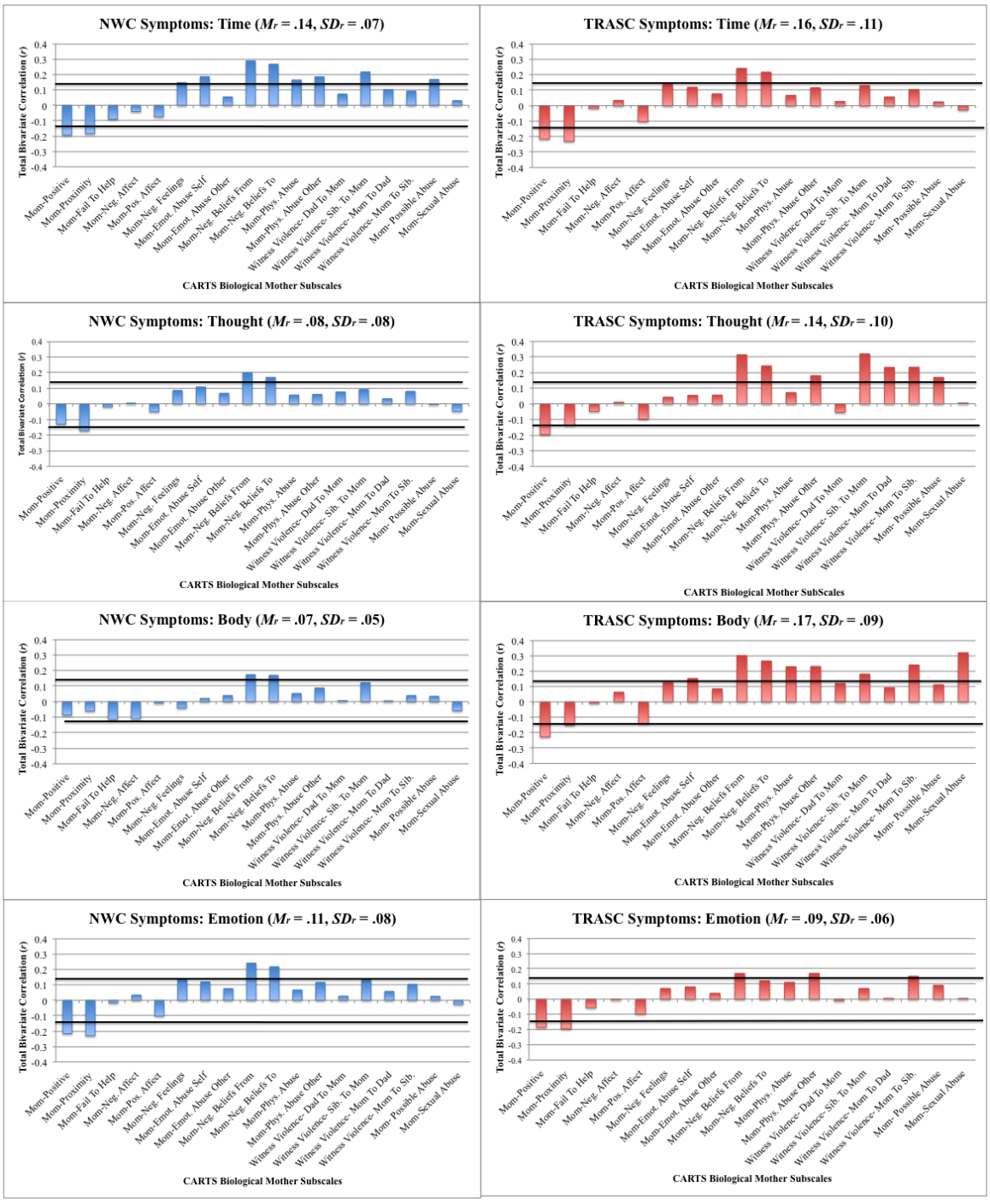

Figure 6. Total bivariate correlations between CARTS Biological Mother subscales and symptoms of NWC (Blue) and (TRASC). Emot = Emotional, Neg = Negative, Phys = Physical, Pos = Positive, Wit = Witness. Black lines represent critical-*r* value (r_{crit} = .134) for significant correlations (n = 300, p = .01).

Figure 7. Correlations of CARTS Biological Father Subscales and Symptoms of NWC and TRASC.

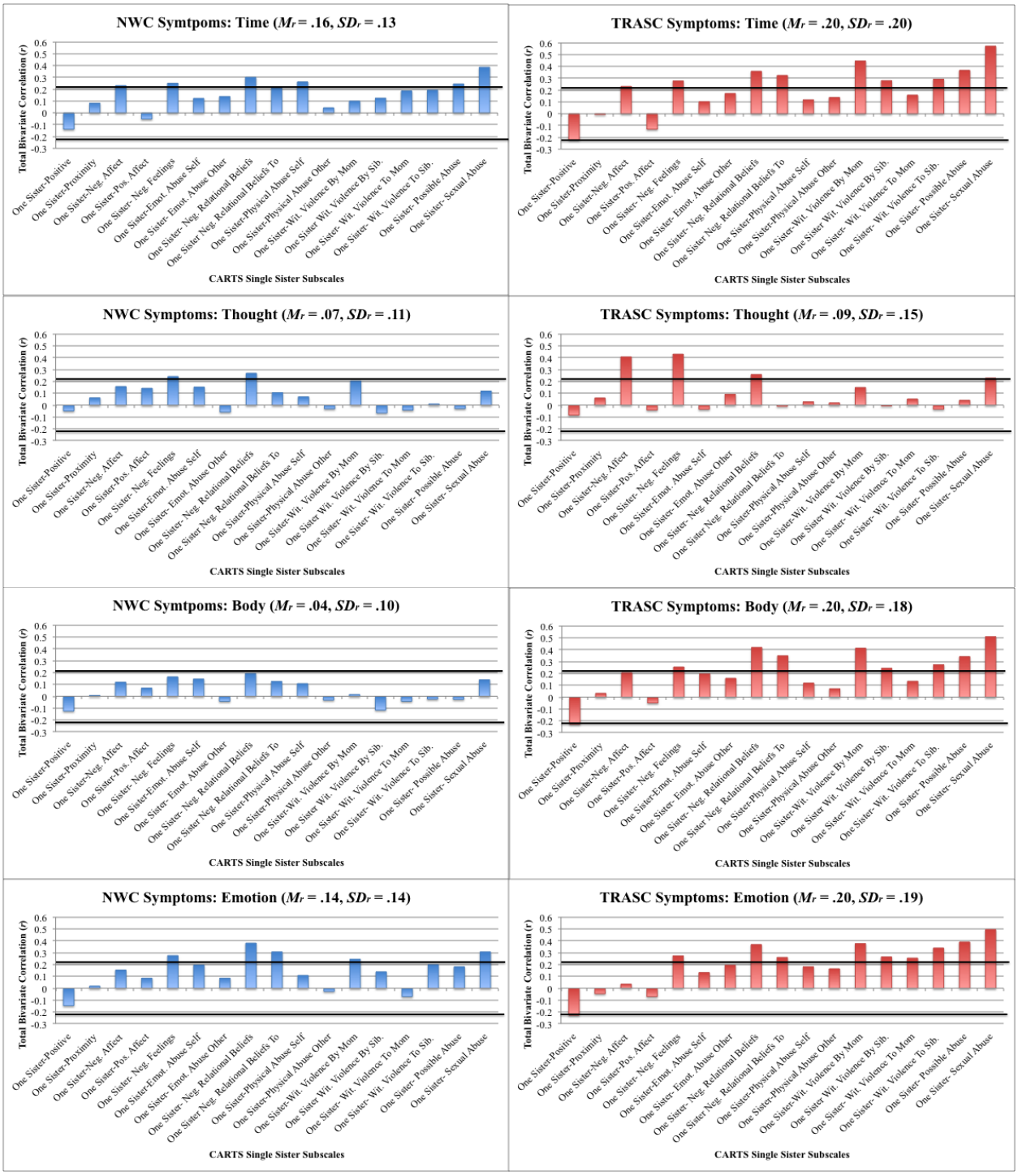

Figure 7. Total bivariate correlations between CARTS Biological Father subscales and symptoms of NWC (Blue) and (TRASC). Emot = Emotional, Neg = Negative, Phys = Physical, Pos = Positive, Wit = Witness. Black lines represent critical-*r* value (r_{crit} = .134) for significant correlations (n = 300, p = .01).

Figure 8. Correlations of CARTS Single Brother Subscales and Symptoms of NWC and TRASC

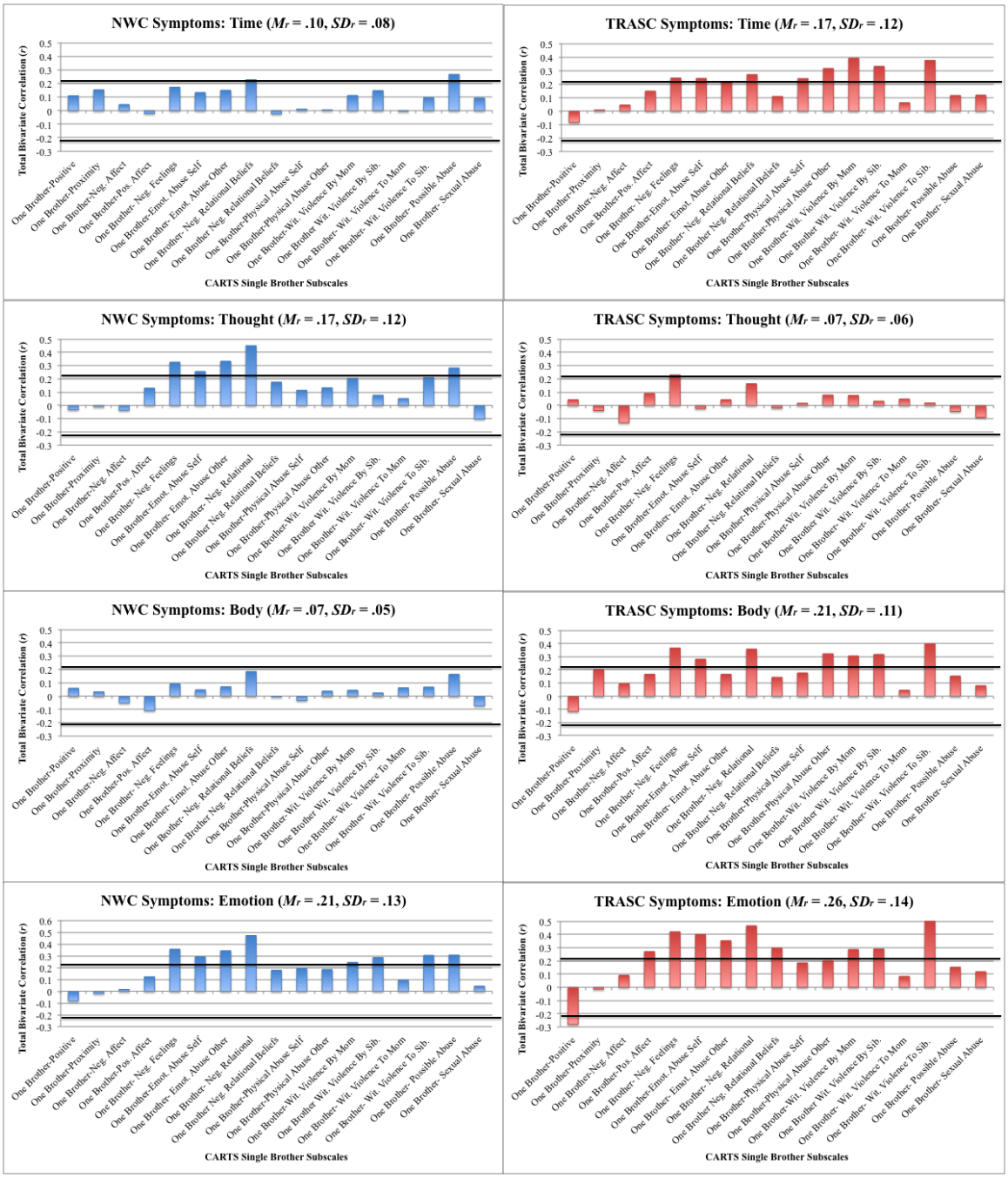

Figure 8. Total bivariate correlations between CARTS One Brother subscales and symptoms of NWC (Blue) and (TRASC). Emot = Emotional, Neg = Negative, Phys = Physical, Pos = Positive, Wit = Witness. Black lines represent critical-*r* value (r_{crit} = .212) for significant correlations (n = 120, p = .01).

Figure 9. Correlations of CARTS Single Brother Subscales and Symptoms of NWC and TRASC

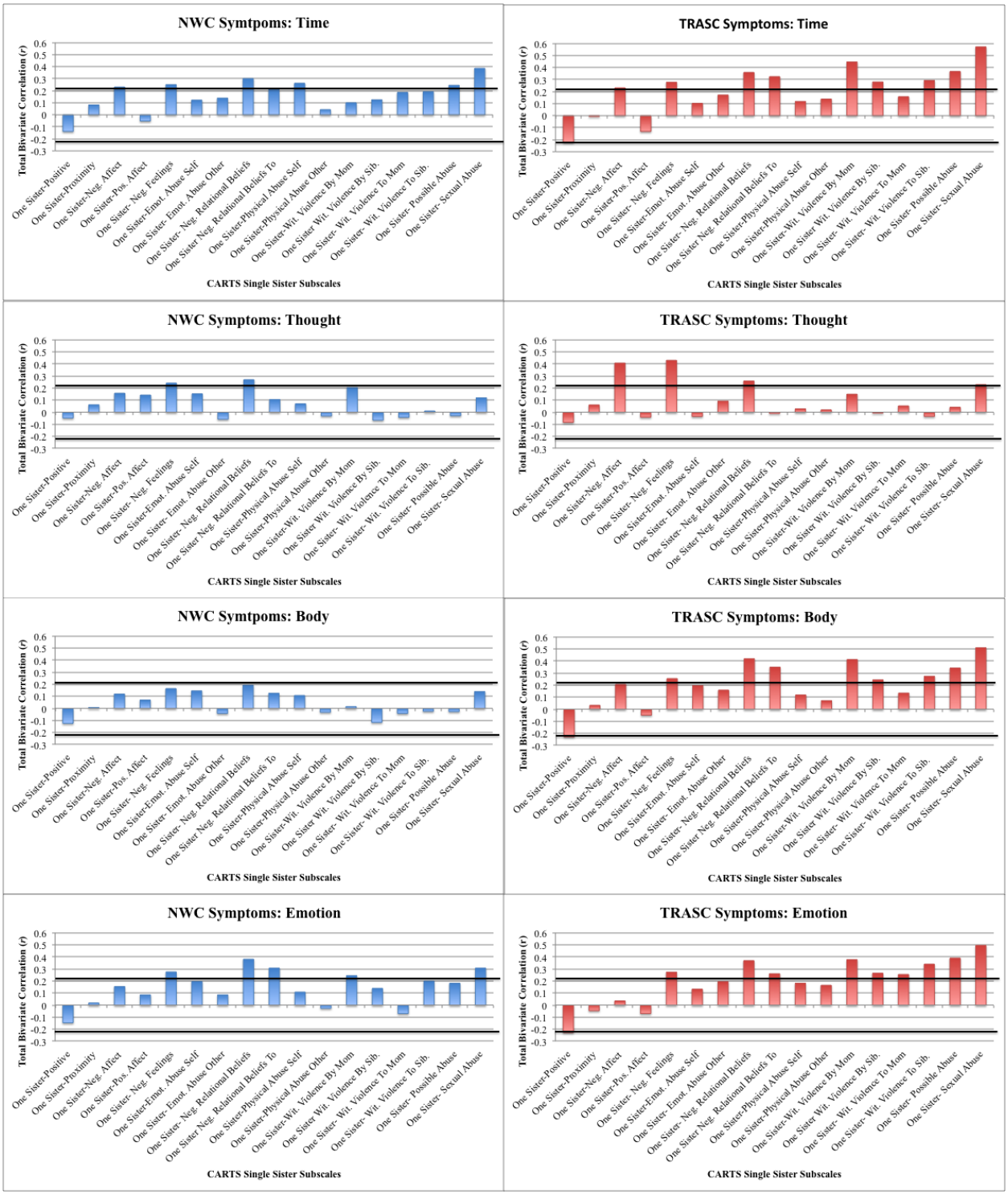

Figure 9. Total bivariate correlations between CARTS One Sister subscales and symptoms of NWC (Blue) and (TRASC). Emot = Emotional, Neg = Negative, Phys = Physical, Pos = Positive, Wit = Witness. Black lines represent critical-*r* value (r_{crit} = .212) for significant correlations (n = 120, p = .01)

Table 5. Intercorrelations between JVQ subscales and NWC and TRASC symptoms.

	NWC Time	NWC Thought	NWC Body	NWC Emotion	TRASC Time	TRASC Thought	TRASC Body	TRASC Emotion
JVQ Conventional	.29*	.28*	.19	.33*	.38*	.38*	.35*	.31*
JVQ Maltreatment	.25*	.24*	.18	.27*	.30*	.33*	.25*	.23*
JVQ Peer/Sibling Victimization	.19	.27*	.18	.30*	.20	.26*	.22*	.26*
JVQ Sexual Victimization	.24*	.18	.16	.22*	.21*	.37*	.19	.12
JVQ Witness	.21	.18	.10	.23*	.35*	.44*	.25*	.19
JVQ Additional Witness	.20	.18	.08	.19	.35*	.32*	.23*	.16
JVQ Total	.27*	.26*	.17	.30*	.35*	.42*	.30*	.25*

Table 5. *$p < .001$.

experiences and NWC and TRASC symptoms. Five different types of abuse performed by an individual's Father were examined (i.e., emotional, physical, sexual, witnessing Father abusing Mother, and witnessing Father abusing Siblings). All mediations were performed using Preacher and Hayes' (2008) indirect macro, which allows for the estimation of indirect effects, as well as direct effects. Bootstrapping techniques using 5000 resamples with replacement were used to estimate indirect effects. In accordance with Preacher and Hayes (2008) indirect effects were deemed significant if the 95% confidence intervals did not contain the number zero.

Importantly, mediation analyses were examined in specific stages. First, total scores for symptoms of NWC and TRASC were calculated. This allowed for the examination of 10 mediation analyses (i.e., the five types of Father abuse and their relationship with both NWC and TRASC total scores). Mediation analyses were deemed to be significant if pathways from the independent variable to the mediating variable (i.e., "a" path) and the mediator to the dependent variable (i.e., "b" path) were significant (Correction for Type I error, $p = .05/10 = .005$), and if the indirect effect was also significant. Types of Father abuse that were significantly mediated by 'Negative Mentalization of Relational Beliefs' were then examined in terms of their relationship with specific dimensions of NWC and TRASC. Using the same criteria as for NWC and TRASC total scores, 28 mediation analyses were performed ("a" and "b" paths corrected for Type I error, $p = .05/28 = .0017$). The types of abuse and symptoms examined were Father physical abuse and symptoms of NWC and TRASC, Father sexual abuse and symptoms of NWC, witnessing Father abuse Siblings and symptoms of NWC and TRASC, and witnessing Father abuse Mother and symptoms of NWC and TRASC.

Mediating effects of Negative Mentalizing were examined between symptoms of NWC and Father physical abuse. A significant mediation model was found for the dimension of Time

(see Figure 10). Multiple regression analyses were conducted to assess each component of the proposed mediator model. First, it was found that Father physical abuse was positively associated with NWC of Time ($\beta = .32$, $t(246) = 2.08$, $p < .05$). It was also found that Father physical abuse was positively associated with Negative Mentalizing ($\beta = .70$, $t(246) = 5.60$, $p < .0001$). Finally, Negative Mentalizing was positively associated with NWC of Time ($\beta = .26$, $t(246) = 3.58$, $p < .001$). Because both the a-path and the b-path were significant, mediation analyses were tested using the bootstrapping method with bias corrected 95% confidence intervals. Results of the mediation analysis confirmed the mediating role of Negative Mentalizing in the relation between Father physical abuse and NWC of Time ($\beta = .19$, CI = .06 to .42). No other mediation models between Father physical abuse and NWC symptom dimensions were significant. Furthermore, no mediation models were significant between Father physical abuse and symptoms of TRASC, according to the above-mentioned criteria. Mediating effects of Negative Mentalizing were examined between Father sexual abuse and symptoms of NWC.

A significant mediation model was found for the dimension of Thought (see Figure 11). Multiple regressions were performed to assess all components of the proposed model. First, it was found that Father sexual abuse was positively associated with NWC of Thought ($\beta = .67$, $t(239) = 3.44$, $p < .0001$). In addition, Father sexual abuse was positively associated with Negative Mentalizing ($\beta = .45$, $t(239) = 3.86$, $p < .001$). It was also found that Negative Mentalizing was positively associated with NWC of Thought ($\beta = .37$, $t(239) = 3.53$, $p < .001$). Due to significance of the a- and b-pathways, mediation analyses were tested using the bootstrapping method with bias corrected 95% confidence intervals. Results of the mediation confirmed the mediating role of Negative Mentalizing in the relation between symptoms of

Figure 10. Negative Mentalizing Partially Mediates the Relationship Between Father Physical Abuse and NWC of Time

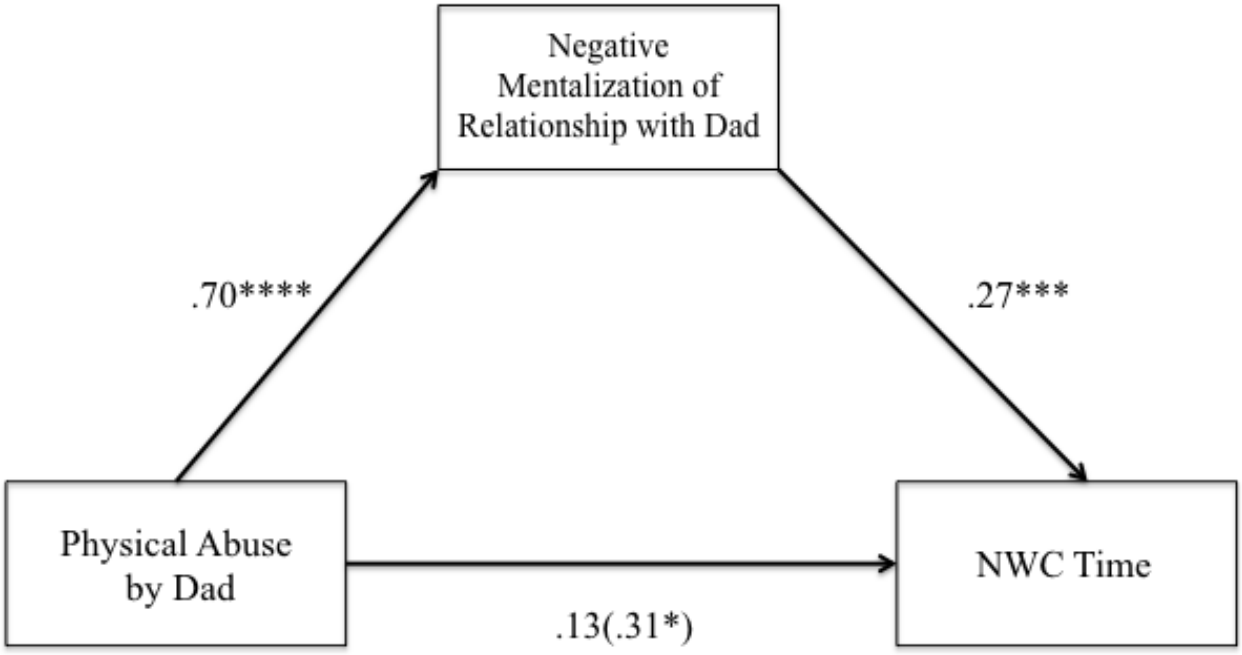

Figure 10. Mediation Model assessing the mediating effect of Negative Mentalization between the relationship of Father physical abuse and NWC of Thought. *Note*: * $p < .05$, ** $p < .01$, *** $p < .001$, **** $p < .0001$.

Figure 11. Negative Mentalizing Partially Mediates the Relationship Between Father Sexual Abuse and NWC of Thought

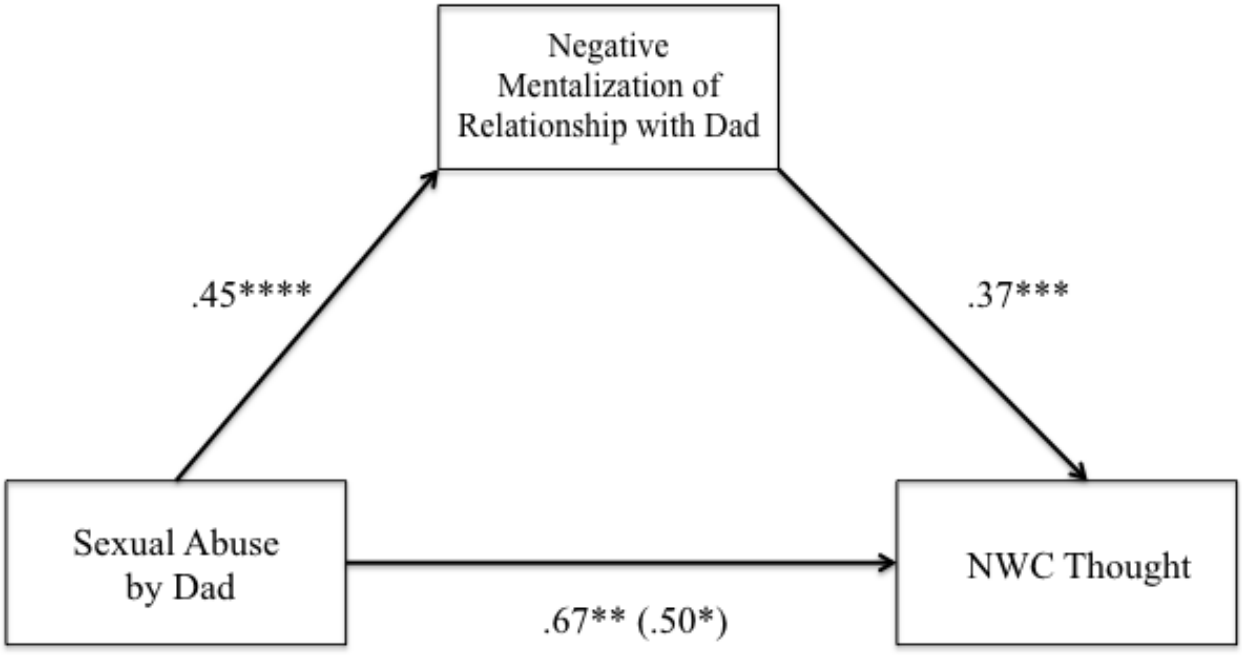

Figure 11. Mediation Model assessing the mediating effect of Negative Mentalization between the relationship of Father sexual abuse and NWC of Thought. *Note*: * $p < .05$, ** $p < .01$, *** $p < .001$, **** $p < .0001$.

Father sexual abuse and NWC of Thought (β = .0001, CI = .29 to .29). No other symptom dimensions of NWC significantly related to Father sexual abuse were significantly mediated by Negative Mentalizing.

Mediating effects of Negative Mentalizing were examined between witnessing Father abuse of Siblings and symptoms of NWC. A significant mediation model was found for the dimension of Time (see Figure 12). It was found that witnessing Father abuse of Siblings was positively associated with NWC of Time (β = .55, $t(243) = 2.02$, $p < .05$). Witnessing Father abuse of Siblings was also positively associated with Negative Mentalizing (β = 1.12, $t(243) = 5.15$, $p < .0001$). Finally, Negative Mentalizing was found to be positively associated with NWC of Time (β =.28, $t(243) = 2.02$, $p < .001$). Due to the significant a- and b-pathways a mediation analysis was performed using the bootstrapping method and 95% confidence intervals. The analysis supported the mediating role of Negative Mentalizing in the relationship between witnessing Father abuse of Siblings and NWC of Time (β = .31, CI = .06 to .80).

A significant mediation model was also found for the dimension of Thought (see Figure 13). Witnessing Father abuse of Siblings was positively associated with NWC of Thought (β = .75, $t(242) = 1.98$, $p < .05$). Witnessing Father abuse of Siblings was also positively associated with Negative Mentalizing (β = 1.12, $t(242) = 5.14$, $p < .0001$). Finally, Negative Mentalizing was positively associated with NWC of Thought (β = .42, $t(242) = 3.91$, $p < .001$). Due to significant a- and b- pathways, a mediation analysis was performed utilizing the bootstrapping method and 95% confidence intervals. Results support the mediating effect of Negative Mentalizing in the relationship between witnessing Father abuse of Siblings and NWC of Thought (β = .47, CI = .07 to 1.39). Mediating effects of Negative Mentalizing were examined between witnessing Father abuse of Mother and symptoms of NWC. A significant mediation model was found for the

Figure 12. Negative Mentalizing Partially Mediates the Relationship Between Witnessing Father's Abuse of Siblings and NWC of Time

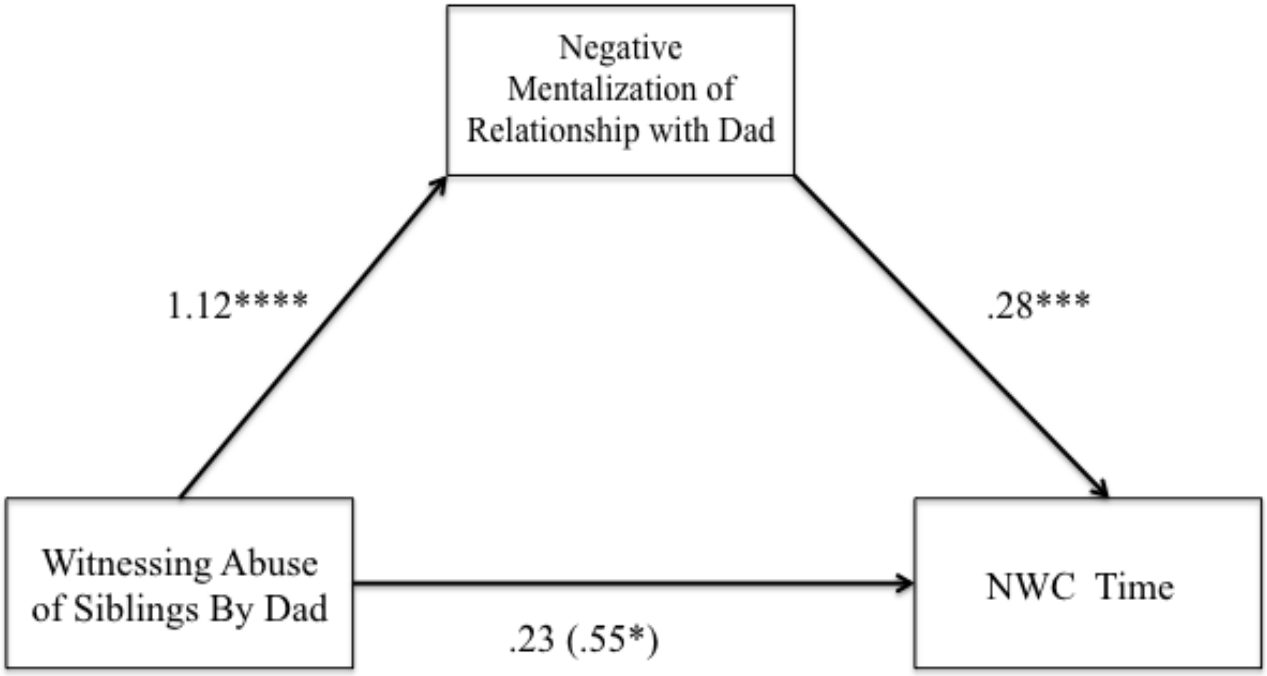

Figure 12. Mediation Model assessing the mediating effect of Negative Mentalization between the relationship of witnessing Father's abuse of Siblings and NWC of Time. *Note*: * $p < .05$, ** $p < .01$, *** $p < .001$, **** $p < .0001$.

Figure 13. Negative Mentalizing Partially Mediates the Relationship Between Witnessing Father's Abuse of Siblings and NWC of Thought

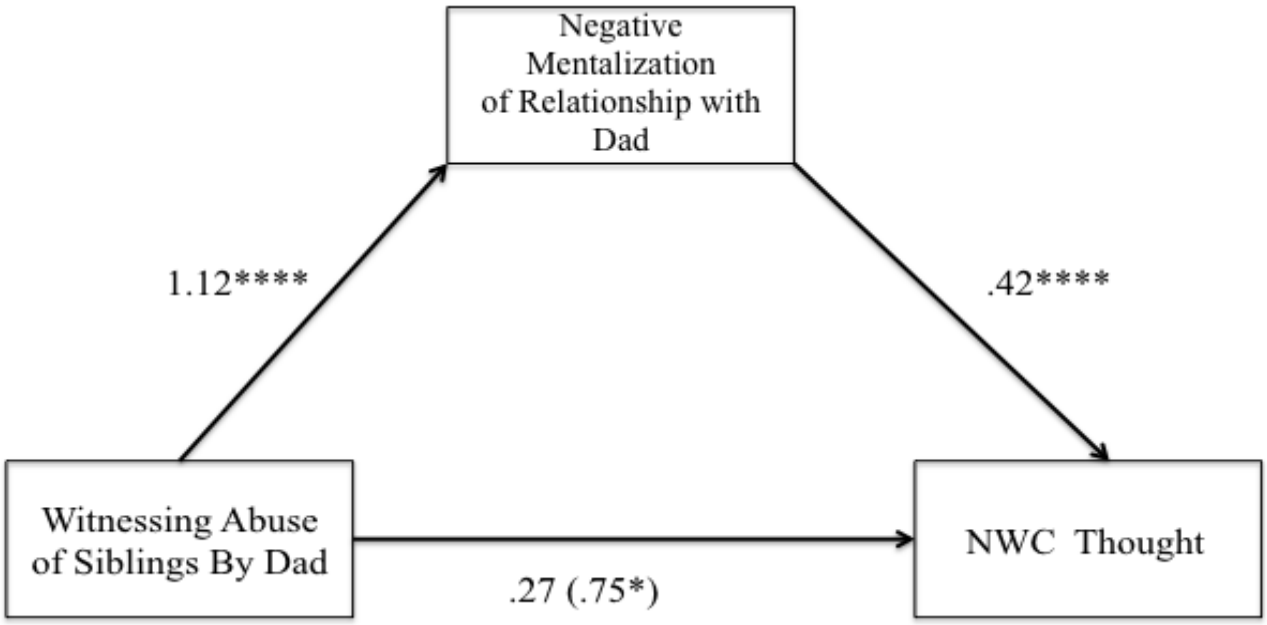

Figure 13. Mediation Model assessing the mediating effect of Negative Mentalization between the relationship of witnessing Father's abuse of Siblings and NWC of Thought. *Note*: * $p < .05$, ** $p < .01$, *** $p < .001$, **** $p < .0001$.

dimension of Time (see Figure 14). It was found that witnessing Father abuse Mother was positively associated with symptoms of NWC of Time (β = .32, $t(247) = 1.13$, *ns*). A significant positive association was found between witnessing Father abuse of Mother and Negative Mentalizing (β = 1.39, $t(247) = 5.81$, $p < .0001$). Finally, Negative Mentalizing was found to be a significant predictor of NWC of Time (β = .29, $t(247) = 4.09$, $p < .001$). Due to the significance of a- and b-pathways a mediation analysis was performed using bootstrapping methods and 95% confidence intervals. Results support a mediating role of Negative Mentalizing in the relationship between witnessing Father abuse Mother and NWC of Time (β = .41, CI = .14 to .95).

A significant mediation model was also found for the dimension of Thought (see Figure 15). Specifically, it was found that witnessing Father abuse Mother was positively associated with NWC of Thought (β = .65, $t(246) = 1.67$, *ns*). Father abuse of Mother was also positively associated with Negative Mentalizing (β = 1.39, $t(246) = 5.80$, $p < .0001$). Finally, it was found that Negative Mentalizing was significantly related to NWC of Thought (β = .43, $t(246) = 4.31$, $p < .0001$). Statistically a- and b-pathways warranted mediation analysis using the bootstrapping method with 95% confidence intervals. Results of the mediation analysis confirmed the mediating role of Negative Mentalizing in relation to experiences of witnessing Father abuse Mother and symptoms of NWC of Thought (β = .6175, CI = .16 to 1.42). No other NWC symptom dimensions met the mediation criteria outlined earlier.

Mediating effects of Negative Mentalizing were examined between witnessing Father abuse of Mother and symptoms of TRASC. A significant mediation model was found for the dimension of Body (see Figure 16). Multiple regression showed Witnessing Father abuse of

Figure 14. Negative Mentalizing Partially Mediates the Relationship Between Witnessing Father's Abuse of Mother and NWC of Time

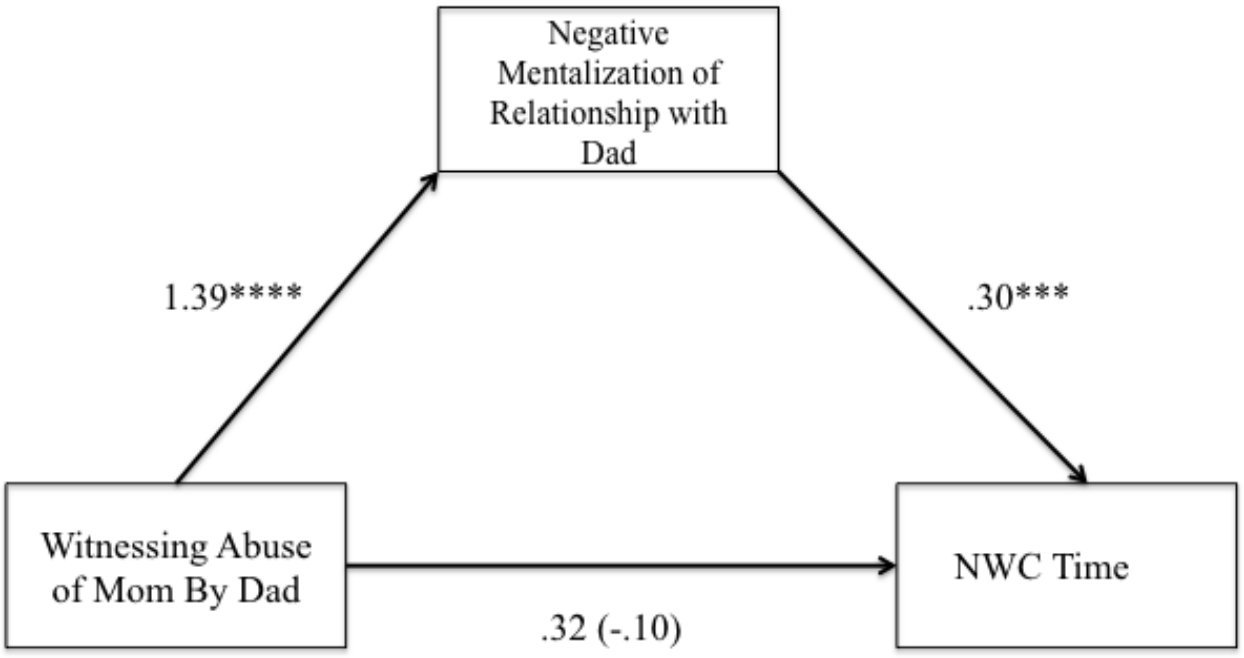

Figure 14. Mediation Model assessing the mediating effect of Negative Mentalization between the relationship of witnessing Father's abuse of Mother and NWC of Time. *Note*: * $p < .05$, ** $p < .01$, *** $p < .001$, **** $p < .0001$.

Figure 15. Negative Mentalizing Partially Mediates the Relationship Between Witnessing Father's Abuse of Mother and NWC of Thought

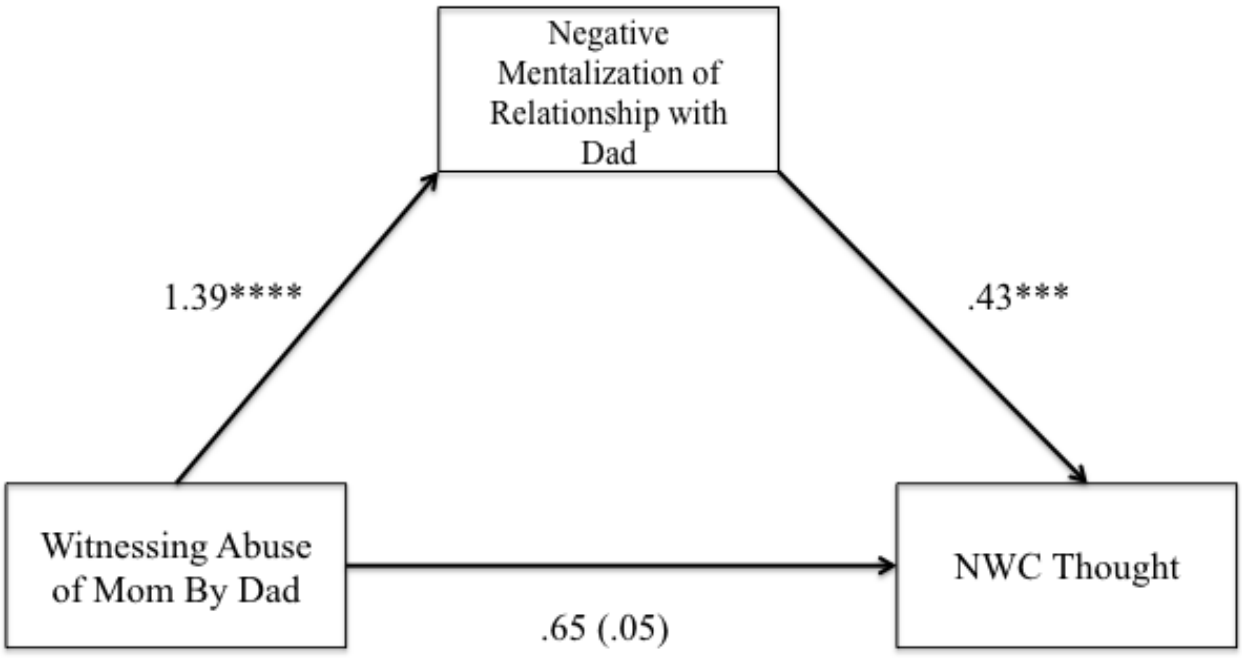

Figure 15. Mediation Model assessing the mediating effect of Negative Mentalization between the relationship of witnessing Father's abuse of Mother and NWC of Thought. *Note*: * $p < .05$, ** $p < .01$, *** $p < .001$, **** $p < .0001$.

Figure 16. Negative Mentalizing Partially Mediates the Relationship Between Witnessing Father's Abuse of Mother and TRASC of Body

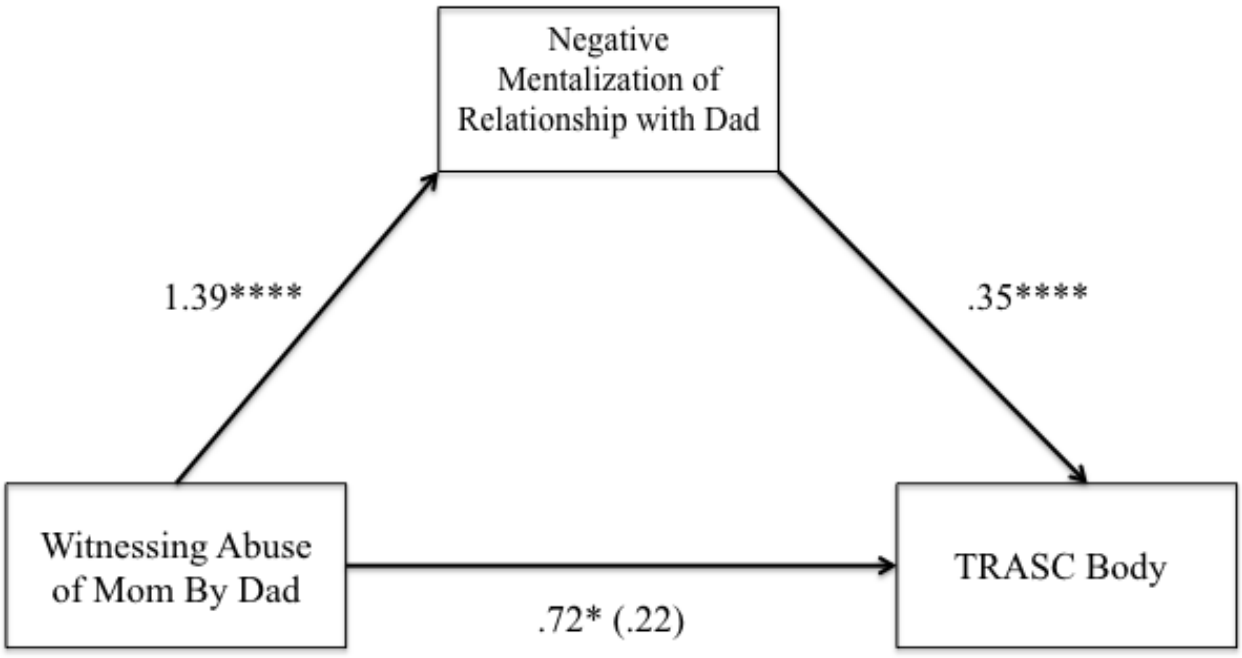

Figure 16. Mediation Model assessing the mediating effect of Negative Mentalization between the relationship of witnessing Father's abuse of Mother and TRASC of Body. *Note*: * $p < .05$, ** $p < .01$, *** $p < .001$, **** $p < .0001$.

Mother was positively associated with TRASC of Body (β = .72, $t(246) = 2.20$, $p < .05$). Witnessing Father abuse of Mother was positively associated with Negative Mentalizing (β = 1.39, $t(246) = 5.80$, $p < .0001$). Finally, Negative Mentalizing was significantly positively associated with TRASC of Body (β = .35, $t(246) = 4.24$, $p < .0001$). Significance of the a- and b-pathways meets study criteria for examining a mediation model utilizing bootstrapping methods and 95% confidence intervals. Results of the mediation analysis support the mediating role of Negative Mentalizing in the relationship between witnessing Father abuse of Mother and TRASC of Body (β = .51, CI = .14 to 1.16). No other symptom dimensions of TRASC were found to meet the study's significance criteria.

Study 3: Validity of CARTS and Gender Differences of NWC and TRASC symptoms

Due to the CARTS being a new measure with limited published empirical data, it was important to establish that scales were internally reliable across multiple family members. Descriptive statistics of CARTS scales within the student sample was reported earlier in Table 3. Also included were Pearson bivariate correlations between different family members and respective CARTS subscales (e.g., Mother Proximity-Seeking correlated with Father Proximity-Seeking). Tables 6-8 presents the bivariate correlations between CARTS subscales for various family members and subscales of the JVQ. Consistent with the CARTS being a measure of relational and attachment experiences within the family, scores on the Box subscales (i.e., non-specific abuse) were most highly correlated with JVQ subscales, compared to Biological Mother and Father scales. Overall, Conventional Crime and Witness subscales were most highly correlated with the CARTS. Peer/Sibling Victimization and Sexual Victimization were not strongly correlated with subscales of the CARTS.

Table 6. Correlations Between JVQ subscales and CARTS Box subscales.

	Conventional	Maltreatment	Peer/Sibling Victimization	Sexual Victimization	Witnessing Violence	Witnessing Violence Additional Items
Positive	.06	-.02	-.08	.04	-.03	-.05
Proximity-Seeking	.03	.06	-.06	.04	-.07	-.07
Fails To Help	-.32*	-.30*	-.25	-.13	-.24*	-.28*
Positive Affect	-.24	-.23	-.15	-.09	-.20	-.24*
N-Affect	-.31*	-.27*	-.26*	-.13	-.22	-.24*
N-Feelings From	-.30*	-.30*	-.32*	-.11	-.18	-.21*
N- Beliefs From	-.40*	-.45*	-.40*	-.30*	-.36*	-.36*
N-Beliefs To	-.35*	-.45*	-.35*	-.25*	-.33*	-.37*
E-Ab to Self	-.27*	-.27*	-.34*	-.11	-.20*	-.24*
E-Ab to Others	-.35*	-.39*	-.33*	-.21*	-.30*	-.31*

P-Ab to Self	-.31*	-.30*	-.28*	-.11	-.23*	-.25*
P-Ab to Others	-.34*	-.27*	-.30*	-.12	-.22*	-.23*
Wit-Violence By Mother	-.30*	-.29*	-.20	-.15	-.26*	-.34*
Wit-Violence By Father	-	-	-	-	-	-
Wit-Violence By Siblings	.40*	-.32*	-.26*	-.20	-.40*	-.47*
Wit-Violence To Mother	-.32*	-.26*	-.13	-.17	-.26*	-.36*
Wit-Violence To Father	-.26*	-.28*	-.13	-.16	-.26*	-.40*
Wit-Abuse To Siblings	-.39*	-.37*	-.21	-.20	-.35*	-.42*
Bad Things	-.36*	-.36*	-.22	-.23*	-.37*	-.48*
S-Ab	-.16	-.23*	-.11	-.24*	-.27*	-.33*

Table 6. N = Negative, E = Emotional, P = Physical, Wit = Witness, S = Sexual. * = $p < .001$ two-tailed.

Table 7. Correlations Between JVQ subscales and CARTS Biological Mother Subscales

	Conventional	Maltreatment	Peer/Sibling Victimization	Sexual Victimization	Witnessing Violence	Witnessing Violence Additional Items
Positive	-.26*	-.23*	-.07	-.15	-.15	-.17
Proximity-Seeking	-.23	-.16	-.11	-.14	-.11	-.16
Fails To Help	.03	.02	-.01	.07	.12	.12
P-Affect	-.22*	-.18	-.18	-.14	-.17	-.17
N-Affect	.16	.12	.08	.14	.22*	.21
N-Feelings From	.24*	.20	.19	.10	-.20*	.20
N-Beliefs From	.42*	.37*	.36*	-.30*	.44*	.44*

N-Beliefs To	.32*	.23*	.16	.25*	.28*	.30*
E-Ab to Self	-.26*	-.27*	.21*	.15	.18	.28*
E-Ab to Others	.28*	.31*	.23*	.19	.29*	.28*
P-Ab to Self	.27*	.19	.13	.14	.26*	.30*
P-Ab to Others	.33*	.22*	.16	.14	.34*	.30*
Wit-Violence By Mother	.21*	.16	.07	.19	.26*	.35*
Wit-Violence By Father	.09	.10	.08	.03	.11	.31*
Wit-Violence By Siblings	.27*	.23*	.15	.28*	.37*	.43*

Wit-Violence To Mother	.22*	.25*	.15	.32*	.35*	.41*
Wit-Violence To Father	.33*	.25*	.14	.25*	.39*	.42*
Wit-Abuse To Siblings	.37*	.24*	.16	.18	.39*	.35*
Bad Things	.28*	.26*	.12	.19	.32*	.37*
S-Ab	.05	.09	.05	.09	.14	.38*

Table 7. N = Negative, E = Emotional, P = Physical, Wit = Witness, S = Sexual. * = $p < .001$ two-tailed.

Table 8. Correlations Between JVQ subscales and CARTS Biological Father subscales.

	Conventional	Maltreatment	Peer/Sibling Victimization	Sexual Victimization	Witnessing Violence	Witnessing Violence Additional Items
Positive	-.20	-.25*	-.10	-.11	-.11	-.22
Proximity -Seeking	-.13	-.11	-.10	-.04	-.02	-.11
Fails To Help	.03	.10	.02	-.01	.08	.10
P-Affect	.16	.12	.08	.14	.22*	-.19
N-Affect	.13	.23*	.10	.02	.15	.20
N- Feelings From	.24*	.34*	.28*	.12	.25*	.30*
N- Beliefs From	.16	30*	.19	.05	.20	.22

N-Beliefs To	.16	.22	.19	.06	.13	.22
E-Ab to Self	.24*	.38	.26*	.19	.30*	.40*
E-Ab to Others	.26*	.39*	.20	.07	.24*	.36*
P-Ab to Self	.27*	.24*	.18*	.08	.26*	.27*
P-Ab to Others	.21	.25*	.14	.04	.20	.35*
Wit-Violence By Mother	.28*	.26*	.22*	.26*	.35*	.34*
Wit-Violence By Father	.34*	.31*	.19	.37*	.47*	.35*
Wit-Violence By Siblings	..19	.22	.13	.08	.19	.28*
Wit-Violence To	.14	.16	.10	.01	.14	.35*

Mother

Wit-Violence To Father	.20	.22	.21	.20	.26*	.22*
Wit-Abuse To Siblings	.31*	.31*	.19	.17	.35*	.48*
Bad Things	.29	.39*	.14	.23*	.41*	.40*
S-Ab	.30*	.30*	.18	.40*	.47*	.38*

Table 8. N = Negative, E = Emotional, P = Physical, Wit = Witness, S = Sexual. * = $p < .001$ two-tailed.

Eight One-Way analyses of variance (ANOVA) were performed to determine whether males and females differed in terms of mean frequency endorsement of NWC and TRASC symptom dimensions. For NWC Time, Levene's test of homogeneity of variance was conducted and deemed non-significant, so equal variances was assumed Levene $F(1, 336) = 1.29$, *ns*. The analysis revealed that females ($M = .75$, $SD = 1.21$) did not endorse intrusive recollections and emotional upset at reminders of traumatic events any more than did males ($M = .67$, $SD = 1.09$). For NWC Thought, Levene's test of homogeneity of variance was also non-significant, so equal variances were assumed, Levene $F(1, 325) = .18$, *ns*. The analysis suggested that females ($M = 1.69$, $SD = 1.64$) endorsed experiencing more negative self-referential thoughts and feelings of being worthless compared to males ($M = 1.32$, $SD = 1.57$). For the dimension NWC of Body, Levene's test was found to be non-significant, and equal variances were assumed, Levene $F(1, 336) = 1.07$, *ns*. In addition to reporting more recurring NWC Thought symptoms, females endorsed experiencing significantly more panic attacks over the past month ($M = 1.07$, $SD = 1.51$) compared to males ($M = .73$, $SD = 1.47$). For the dimension of Emotion, Levene's test was found to be non-significant, so equal variances were assumed, Levene $F(1, 325) = .20$, *ns*. It was found that males ($M = 1.34$, $SD = 1.28$) did not endorse experiences of guilt, shame, depressed mood, or anger/irritability anymore than females ($M = 1.40$, $SD = 1.47$).

For the dimension TRASC of Time, Levene's homogeneity of variance was found to be non-significant, Levene $F(1, 325) = .15$, *ns*. Women ($M = .46$, $SD = 1.24$) did not endorse flashback experiences significantly more on average compared to men ($M = .62$, $SD = 1.40$). For TRASC of thought, Levene's test was found to be significant $F(1, 325) = 8.11$, $p < .01$, which suggests that findings should be interpreted with caution. Men ($M = .35$, $SD = 1.17$) did not endorse experiences of voice hearing more frequently on average than did women ($M = .19$, *SD*

= .75). For experiences of depersonalization, Levene's test was found to be non-significant, Levene $F(1, 325) = .86$, *ns*. Men ($M = .53$, $SD = 1.10$) were not found to endorse significantly more experiences of depersonalization compared to women ($M = .40$, $SD = 1.24$). Finally, for the dimension of Emotion, Levene's test was found to be non-significant, Levene $F(1, 325) = .27$, *ns*. Women ($M = .84$, $SD = 1.27$) compared to men ($M = .84$, $SD = 1.42$) were found not to endorse significantly more experiences of emotional numbing.

Discussion

The Four Dimensional (4D) Model of Trauma-related Dissociation (Frewen & Lanius, 2014) differentiates symptoms of clinically significant distress based on whether the symptoms potentially occur within the realm of normal waking consciousness (NWC) or whose presence intrinsically exemplifies trauma related altered states of consciousness (TRASC). Four dimensions of consciousness are specified by the 4D-Model: 1) Time (differentiating the experience of dissociative flashbacks from other forms of intrusive recollections and reminder distress of traumatic events); 2) Thought (distinguishing between thoughts which occur in the second person- compared to first-person perspective, the former being similar to voice hearing); 3) Body (discriminating between out of body experiences of depersonalization and embodied experiences of anxiety/distress, such as rapid heart and/or breathing rate); 4) Emotion (severalizing the experience of emotional numbing and affective shut-down from the range of normal waking emotional states, e.g., depressed mood, guilt, shame, anger, irritability). In addition, the 4D-model hypothesizes that symptoms of TRASC, compared to NWC distress, will be: 1) observed less frequently, in terms of mean frequency endorsement; 2) less intercorrelated when measured as moment-to-moment states; 3) more strongly related with trait measures of dissociation; and 4) observed more often in individuals who have been repeatedly traumatized,

across multiple developmental stages. The current study is an extension of the first empirical tests of this framework.

Support for the predictions of the 4D-Model were stronger within the sample of undergraduate students then in PTSD patients. In regards to the first hypothesis, across both samples experiences of NWC distress were endorsed as occurring more frequently, on average, than experiences of TRASC for the dimensions of Time, Thought, and Body. However, only within the student sample was NWC distress endorsed as occurring more frequently than symptoms of TRASC for the dimension of Emotion. As pertaining to the second hypothesis, evidence that symptoms of NWC distress were less intercorrelated than experiences of TRASC was found only within the student sample. To be specific, any two symptoms of NWC were *not* more strongly correlated than any two symptoms of TRASC; however, the general pattern suggested that symptoms of NWC distress were experienced in concordance more than symptoms of TRASC. Within the patient sample, the opposite pattern was observed. Symptoms of TRASC were more strongly intercorrelated than symptoms of NWC distress.

Regarding the third hypothesis, evidence obtained from both traumatized women and undergraduate students did not provide strong support. Within the traumatized women sample, symptoms of TRASC were more strongly correlated with Traumatic Dissociation Scale (TDS; Carlson & Dalenburg, 2011) total scores than were symptoms of NWC distress. However, symptoms of TRASC did not increment in prediction of between-person variation of TDS scores over symptoms of NWC distress. Within undergraduate students, symptoms of TRASC were not more strongly associated with TDS total scores than were symptoms of NWC distress. Moreover, although symptoms of TRASC incremented over NWC distress in prediction of TDS scores, the reverse was also true (i.e., symptoms of NWC distress incremented over TRASC

symptoms in predicting between-person variation of TDS scores), which suggests a lack of specificity of trait measures of dissociation to experiences of TRASC.

The fourth hypothesis of the 4D-Model has not received sufficient empirical evaluation from previous research assessing the 4D-Model (Frewen & Lanius, 2014). Previous research has assessed this hypothesis only within a sample of female PTSD patients. Furthermore, this hypothesis was assessed utilizing the Childhood Trauma Questionnaire-Short Form (CTQ-SF; Bernstein & Fink 1998), which is a reliable and valid assessment of childhood traumatic experiences; however, the CTQ-SF does not assess certain other forms of early childhood adversity such as unresponsive parenting and disorganized attachment (Carlson, 1998), and the emotional unavailability of parents (Frewen et al., 2013). In response, the current study assessed the developmental and repetitive trauma hypothesis of the 4D-Model using two questionnaires, each using a different assessment methodology.

Within the sample of traumatized women, the fourth hypothesis (i.e., repetitive and developmental childhood trauma will be more strongly associated with TRASC) was not supported. No symptom dimension of TRASC was significantly correlated with any subscale of the CTQ-SF, or the CARTS (i.e., Box, Mother, Father, One Brother, One Sister, Multiple Brothers, Multiple Sisters). This finding is largely congruent with past research examining the 4D-Model in a sample of female PTSD patients (Frewen & Lanius, 2014). The fact that individuals seeking treatment for significant psychological distress due primarily to experiences of severe abuse and neglect seems logically inconsistent with these findings. One potential explanation is the tendency for individuals to under-report the significance of negative experiences when retrospectively reporting (Hardt & Rutter, 2004). Another explanation,

statistically speaking, is the small sample size of PTSD patients in the current study, which significantly impacted the statistical power of detecting significant correlations.

Within the student sample, Juvenile Victimization Questionnaire-Adult Retrospective (JVQ-AR; Finkelhor et al., 2005) total scores and subscale scores were significantly correlated with all dimensions of TRASC. However, only the subscale "Witness" (e.g., "When you were a child, did you SEE your parent hit, beat, kick, or physically hurt your brothers or sisters, not including a spanking on the bottom?") subscale was correlated significantly stronger with symptoms of TRASC compared to symptoms of NWC distress. Importantly, this scale includes items that would be rarely experienced by undergraduates in Canada (e.g., warzone exposure, witnessing murder); therefore, the Witness subscale is not specific to witnessing violence within the family. To address this limitation four additional items were added to the assessment battery of the JVQ-AR asking specifically about witnessing violence between family members in the home. This scale was highly correlated with the JVQ-AR Witness subscale, and also was correlated significantly stronger with symptoms of TRASC compared to NWC distress. This finding is congruent with previous research implicating the important role of witnessing violence of family members to multiple symptoms of psychopathology, including dissociation (Teicher & Vitaliano, 2011).

Childhood maltreatment was also assessed within the student sample utilizing the novel assessment methodology of the CARTS (Frewen et al., 2013). The CARTS assesses not only direct forms of maltreatment, but also relational (e.g., receiving negative feelings from family members) and attachment experiences (e.g., proximity/security seeking behaviours). In addition, the CARTS assesses not only what maltreatment occurred (e.g., emotional abuse), but also who performed the abusive behaviour and to whom (e.g., dad emotionally abused me, and my

younger brother). As Figures 5-9 demonstrated, subscales of the CARTS across a variety of family members were significantly correlated with experiences of TRASC. This finding marks the first empirical evidence that multiple forms of maltreatment are significantly related to multiple symptoms of TRASC, as previous research only found a significant relationship between second-person voice-hearing and repetitive childhood sexual abuse (Frewen & Lanius, 2014). The present study highlights that depersonalization (i.e., out-of-body experiences), moreso than flashbacks, voice-hearing, and emotional numbing, as a form of TRASC may be a particularly frequent long term outcome of experiences of direct abuse that are enmeshed within a family characterized by poorly developed relational bonds, mentalized negative beliefs of other family members, and frequent exposure to violence and abuse of multiple family members (i.e., "pathogenic family environments"; Cichetti & Toth, 2005). Importantly, analyses did not suggest that endorsement of TRASC symptoms was dependent on gender; however, females did endorse higher levels of NWC of Thought and Body.

Additional validity for using the assessment methodology of the CARTS comes from the finding that the relationship between maltreatment and various symptoms of TRASC depends on which family member performed the specific abusive behaviour. For example, maltreatment from Mom was not strongly related to emotional numbing; in contrast, maltreatment from one's Brother was strongly and significantly correlated with emotional numbing. In addition, maltreatment from Dad was more strongly associated with all dimensions of TRASC than was maltreatment from Mom. This finding supports and is congruent with the relational socioecological framework of maltreatment experiences (Cicchetti & Toth, 2005), in that it is important to look at both the abuse itself, and who specifically performed the abuse. An additional novel finding, which also adds validity to the assessment methodology of the CARTS,

was that brothers' and sisters' maltreatment was significantly related to symptoms of TRASC. For both genders of siblings this effect was especially true for flashbacks, depersonalization, and emotional numbing.

There is a paucity of research on the effects of sibling violence and abuse, as well as the quality of these relationships, and their contributions to the development of dissociative experiences later in life. Specifically, the current study found that experiences relating to abusive sibling relationships have just as strong a relationship to trauma-related dissociative experiences as that of abusive parental relationships for flashbacks, depersonalization, and emotional numbing. Of pertinence to assessments utilizing the CARTS, Mothers' and Fathers' abusive behaviour significantly predicted symptoms of second-person voice hearing; however, Brothers' and Sisters' abusive behaviour was correlated only to a minimal degree. This finding suggests that parental maltreatment, as opposed to sibling maltreatment, may be a particularly important etiological factor in voice-hearing symptoms. Furthermore, examination of Figures 6-7 suggests that Father sexual abuse, and negative relational beliefs from Mom (e.g., I thought that my Mom did not want me in our family) may be particularly important adverse experiences in the development of voice hearing.

Negative Mentalization

Mediation analyses largely supported the predictions outlined throughout the introduction. The current study examined the mediating role of Negative Mentalization about one's relationship with their Father (i.e., negative relational beliefs from one's Father; e.g., my Father hates me, my Father does not want me in our family) and the association between various forms of abuse exposure and symptoms of NWC and TRASC. Four forms of abuse were examined, 1) physical abuse by Father; 2) sexual abuse by Father; 3) witnessing abuse of Mother

by Father; and 4) witnessing abuse of Siblings by Father. For three of the four forms of abuse examined (i.e., sexual abuse by Father, witnessing abuse of Mother by Father, and witnessing abuse of Siblings by Father) mediation analyses indicated a significant indirect effect of Negative Mentalization in the relationship between abuse and NWC of Thought (i.e., negative self-referential processing, and feeling worthless). The relationship between the concepts of mentalizing and self-referential processing has been implicated in previous research (Allen & Fonagy, 2006; Lanius, Bluhm, & Frewen, 2011). The results of the mediation analyses of the current study suggest that Negative Mentalization of one's relationship with their Father may partially explain the relationship between these forms of abuse and the experience of NWC distress pertaining to negative thought processes and feelings of worthlessness. Relevant to demonstrating the utility of the CARTS, the results of the mediation analyses rely not only on *what* type of abuse was performed but *who* performed the abuse, and to *whom* the negative beliefs pertained to.

Negative Mentalization, or negative relational beliefs from one's Father may best be understood as a maladaptive relational schema (Baldwin, 1992). That is to say a child may develop a set of negative relational beliefs in regards to their Father (e.g., my Father hates me), which allows the child to interpret and make sense of their Father's behaviour towards them, and towards others. This conceptualization provides a framework for understanding the results of the significant mediation analyses reported in the current study. For example, a child who is repeatedly sexually abused by their Father may develop a negative relational schema that allows for the interpretation of their Father's behaviour (e.g., "my Father hurts me and makes me feel yucky sometimes, therefore he must not like me"). These early-formed maladaptive relational schemas become engrained after repeated exposure to the abuse, and subsequently lead to the

negative self-referential scripts, and feelings of worthlessness later in life (e.g., that person left our conversation suddenly, they must not like me, no one likes me). The results of the mediation analyses suggest that these maladaptive relational schemas may also develop following the witnessing of the abuse of other family members (e.g., "my dad hurts my mom a lot, he must not love her, he doesn't love me either"; "my dad hits my sister and makes her cry, he must not want her to be around him, maybe he doesn't want me near him either").

The results of the current study also suggest that these maladaptive relational schemas partially explain the relationship between both physical abuse by Father, and witnessing the abuse of Siblings by Father, and current symptoms of intrusive recollections and emotional upset at reminders of the traumatic event (i.e., NWC of Time; see Figure 10). For example, a child may be physically abused repeatedly by their Father, which leads the child to think that their Father must hate them. This maladaptive relational schema may lay the groundwork for intrusive recollections of physically abusive experiences when the individual feels unwanted or unloved in their daily life. The only significant mediation analysis involving symptoms of TRASC was the dimension of Body. Negative relational beliefs from one's Father significantly mediated the relationship between witnessing the abuse of one's Mother by their Father and depersonalization experiences. Although mediation analyses do not allow for speculation regarding causal mechanisms of NWC and TRASC symptoms relating to childhood abuse, the results clearly indicate that attachment and relational variables account for at least part of the relationship between childhood abuse and symptoms of NWC and TRASC.

Limitations

Although the current study extended previous findings of past research with the 4D-Model, these advancements must be taken in consideration of several limitations. First, the

current study examined the 4D-Model in a small sample of only female PTSD patients. Therefore, statistical power to assess significant relationships was very low. In addition, due in part to the small sample size, no patients endorsed experiences of second-person voice hearing. This limited all prediction equations to three dimensions of TRASC, and did not permit analyses of voice-hearing's relationship with repetitive and developmental trauma. This is significant as previous research established that voice hearing might be a particularly frequent outcome of experiences of sexual abuse (Frewen & Lanius, 2014). In addition, any significant findings within the patient sample are limited to females. Future research must examine the structure and hypotheses of the 4D-Model in samples containing substantial numbers of men. Furthermore, if the primary goal of the 4D-Model is to provide an empirical framework for trauma-related dissociation, then the model must be examined within clinical populations having a wide range of psychiatric diagnoses, not just limited to PTSD.

Psychometric limitations are similar for both the patient and student samples. First, operationalizations of TRASC symptoms were comprised of scales consisting of only one item, and were responded to retrospectively via self-report. Therefore, analysis of reliability was not afforded, and issues related to that of method variance (i.e., higher item intercorrelations due to the same assessment approach) is particularly cautionary with short scale length. In addition, all measures required participants to retrospectively recall various childhood experiences, as well as clinically relevant symptoms occurring over the previous month. Within the student sample, calculations utilizing the Dissociative Experiences Scale-Brief (DES-B; Carlson & Dalenburg, 2011) utilized only the first seven-items of the full eight-item listing. This error was somewhat corrected by taking the mean endorsement of the first seven-items and multiplying by eight, which brought up the reliability of the scale to an acceptable level. Regardless of corrections,

findings pertaining to the DES-B must be interpreted with caution. Finally, within the student sample, endorsement of abusive experiences was low, and this was especially the case for sexual abuse. Low endorsement rates for abusive experiences may have artificially inflated the strength of correlations between abuse and various symptoms of NWC distress and TRASC, in comparison to the true association in the population.

Future Directions and Implications

Future research could improve and extend upon the current study in a number of ways. First, additional trait measures must be used in validating the hypothesis that TRASC symptoms will be more strongly correlated with dissociation measures compared to NWC symptoms. The current study did not find strong support for this hypothesis, which may be due in part to the measures used to assess the hypothesis. Both the TDS and the DES-B contain items, which are largely "normative", and furthermore are not necessarily specific to trauma-related dissociation. Future research would benefit from using a measure such as the Multiscale Dissociation Inventory (MDI; Briere 2002), which measures six different types of dissociative responses. Importantly, the MDI contains both pathological and non-pathological dissociative responses. A survey employing this method would afford testing that symptoms of TRASC are more highly correlated with MDI total scores, and pathological dissociation subscales, whereas symptoms of TRASC would be no more highly correlated with non-pathological MDI subscales than NWC symptoms.

Future research would also benefit from disseminating measures with standardized cut-offs for maltreatment severity based on norms, such as the CTQ. This would allow for groups with varying levels of maltreatment exposure to be examined. This procedure affords a more thorough examination of the fourth hypothesis of the 4D-Model (i.e., symptoms of TRASC being

more *specific* to repetitive and developmental trauma, and NWC symptoms being more *sensitive* to trauma exposure in general). Specifically, it could be tested whether symptoms of TRASC will be more strongly associated with scores on child maltreatment measures within the 'severely' maltreated group, whereas in the 'moderately' maltreated group scores on childhood maltreatment measures are correlated with NWC and TRASC to the same degree.

Finally, future research would also benefit from assessing the 4D-Model in different samples of participants. To date, the 4D-model has only been tested within students and within traumatized women diagnosed with PTSD. Assessing the 4D-Model within a general population Internet sample would greatly extend the current study. Past research, as well as the current study, has found very minimal support for the repetitive and developmental trauma hypothesis within PTSD patients exposed to severe childhood trauma. Conversely, the current study found many significant associations between symptoms of TRASC and childhood trauma exposure in a sample of students with a very low base rate of maltreatment experiences. Internet samples may contain higher base rates of trauma overall compared to student samples, and conversely, lower frequency and severity of childhood trauma in comparison to clinical groups. An internet sample may attenuate both floor and ceiling effects which had an increased risk of manifestation in the current study.

The structure, organization, and empirical nature of the 4D-Model puts it in position to fill theoretical gaps within the dissociation literature, which past and modern interpretations of the phenomenon has not been able to achieve. The 4D-Model in one sense can be viewed as an extension of the framework posited by Barlow and Freyd (2009), in which the authors suggest dissociation should be viewed "as a set of characteristics…that consists of two separate but connected braches" (p. 94). The first branch (i.e., Branch A) is what can be considered

"normative" dissociation, which is experiences such as absorption and fantasy, among others. The second branch (i.e., Branch B), according to Barlow and Freyd, has a trauma-based etiology (i.e., trauma-related dissociation) and are less temporary in nature, such as experiences of depersonalization, identity confusion and/or alteration. Specifically, Barlow and Freyd note that Branch B "may consist of several sub-branches, and empirical research can help clarify the relationships among these concepts" (p. 94). These sub-branches can be thought of as the four dimensions of TRASC (i.e., Time, Thought, Body, and Emotion). Currently, minimal knowledge exists about trauma-related dissociation excluding the symptom of depersonalization. The 4D-Model has the potential to increase our knowledge about which symptoms constitute trauma-related dissociation, the etiological factors that cause these symptoms, and how these symptoms relate and covary with one another. The 4D-Model has the potential to impact assessment and diagnostic practices related to dissociation; specifically, the dissociative subtype of PTSD. The current study provides initial empirical evidence that several other symptoms including depersonalization may be indicative of dissociative responses following exposure to traumatic stress.

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Appendix A

The Traumatic Dissociation Scale

For each statement below, check one box to show how much each thing has happened to you IN THE PAST WEEK

Response options as seen online:

- Not at all
- Once or twice
- Almost every day
- About once a day
- More than once a day

1. My body felt strange or unreal.
2. Things around me seemed strange or unreal.
3. I got reminded of something upsetting and then spaced out for a while.
4. I had moments when I lost control and acted like I was back at an upsetting time in my past
5. I noticed that I couldn't remember the details of something upsetting that happened to me.
6. Familiar places seemed strange or unreal.
7. I felt like I was outside myself, watching myself do things.
8. I heard something that I know really wasn't there.
9. I got upset about something and can't remember what happened next.
10. I felt like I was in a movie – like nothing that was happening was real.
11. I didn't feel pain when I was hurt and should have felt something.
12. A memory came back to me that was so strong that I lost track of what was going on around me.
13. I found myself staring into space and thinking nothing.
14. I couldn't remember the things that had happened during the day even when I tried to.
15. I felt like I wasn't myself.
16. I felt like I was in a daze and couldn't make sense of what was going on around me.
17. I saw something that seemed real, but was not.
18. I suddenly realized that I hadn't been paying attention to what was going on around me.
19. I felt cut off from what was going on around me.
20. Parts of my body seemed distorted – like they were bigger or smaller than usual.
21. I reacted to people or situations as if I were back in an upsetting time in my past.

22. I got so focused on something going on in my mind that I lost track of what was happening around me.
23. I noticed there were gaps in my memory for things that happened to me that I should be able to remember.
24. I smelled something that I know really wasn't there.

Appendix B

Childhood Attachment Relational Trauma Screen: Exposure to Domestic Violence Sub-Scale

1. I witnessed (watched or heard) this person being threatened or assaulted BY MY MOTHER.
2. I witnessed (watched or heard) this person being threatened or assaulted BY MY FATHER.
3. I witnessed (watched or heard) this person being threatened or assaulted BY ONE OR MORE OF MY BROTHER(S).
4. I witnessed (watched or heard) this person being threatened or assaulted BY ONE OR MORE OF MY SISTER(S).
5. This person threatened or assaulted MY MOTHER.
6. This person threatened or assaulted MY FATHER.
7. This person threatened or assaulted ONE OR MORE OF MY BROTHER(S).
8. This person threatened or assaulted ONE OR MORE OF MY SISTER(S)