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The 4D-Model of Trauma-related Dissociation: An Empirical Test of a Novel Theoretical Framework

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The 4D-Model of Trauma-related Dissociation: An Empirical Study of a Novel Theoretical Framework

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ABSTRACT

BACKGROUND:

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).

METHODS:

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.

RESULTS:

Within the student sample, NWC symptoms were endorsed as occurring more frequently than TRASC symptoms. Any two symptoms of NWC were not intercorrelated stronger than any two symptoms of TRASC; however, 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 scale scores than were NWC symptoms.

CONCLUSIONS:

In general, the hypotheses and structure of the 4D-model were supported within the student sample, although some hypotheses had stronger support than did others. Evidence for the 4D-Model was not as strong within the PTSD patient sample. Limitations, future directions, and implications are discussed.

INTRODUCTION

- Dissociation is defined as “an involuntary disruption of the normal integration of conscious awareness and control over one’s mental processes” (Speigel et al., 2011, p. 826).
- Some researchers have noted that the term “dissociation” is used too broadly, and has been used to describe many diverse clinically significant symptom presentations; and conversely, to describe experiences and processes which are normative.
- Several attempts have been made to organize dissociative symptoms as a whole, but there currently is a lack of a comprehensive model for dissociation symptoms within post-traumatic stress disorder (PTSD) specifically.
- Furthermore, within research examining PTSD, debate regarding which symptoms constitute dissociative symptoms is ongoing. Currently, the DSM-5 recognizes symptoms of depersonalization and derealization as criteria for the dissociative subtype of PTSD.
 - However, symptoms such as flashbacks and emotional numbing, which are considered to be dissociative symptoms, have no representation in this diagnostic category.
- The 4D-Model of Trauma-related Dissociation (Frewen & Lanius, 2014) is a testable theoretical framework that allows for the examination of dissociative symptoms in PTSD. The model differentiates states of clinically significant distress based on whether they exemplify symptoms of Normal Waking Consciousness (NWC) or symptoms of Trauma Related Altered States of Consciousness (TRASC).

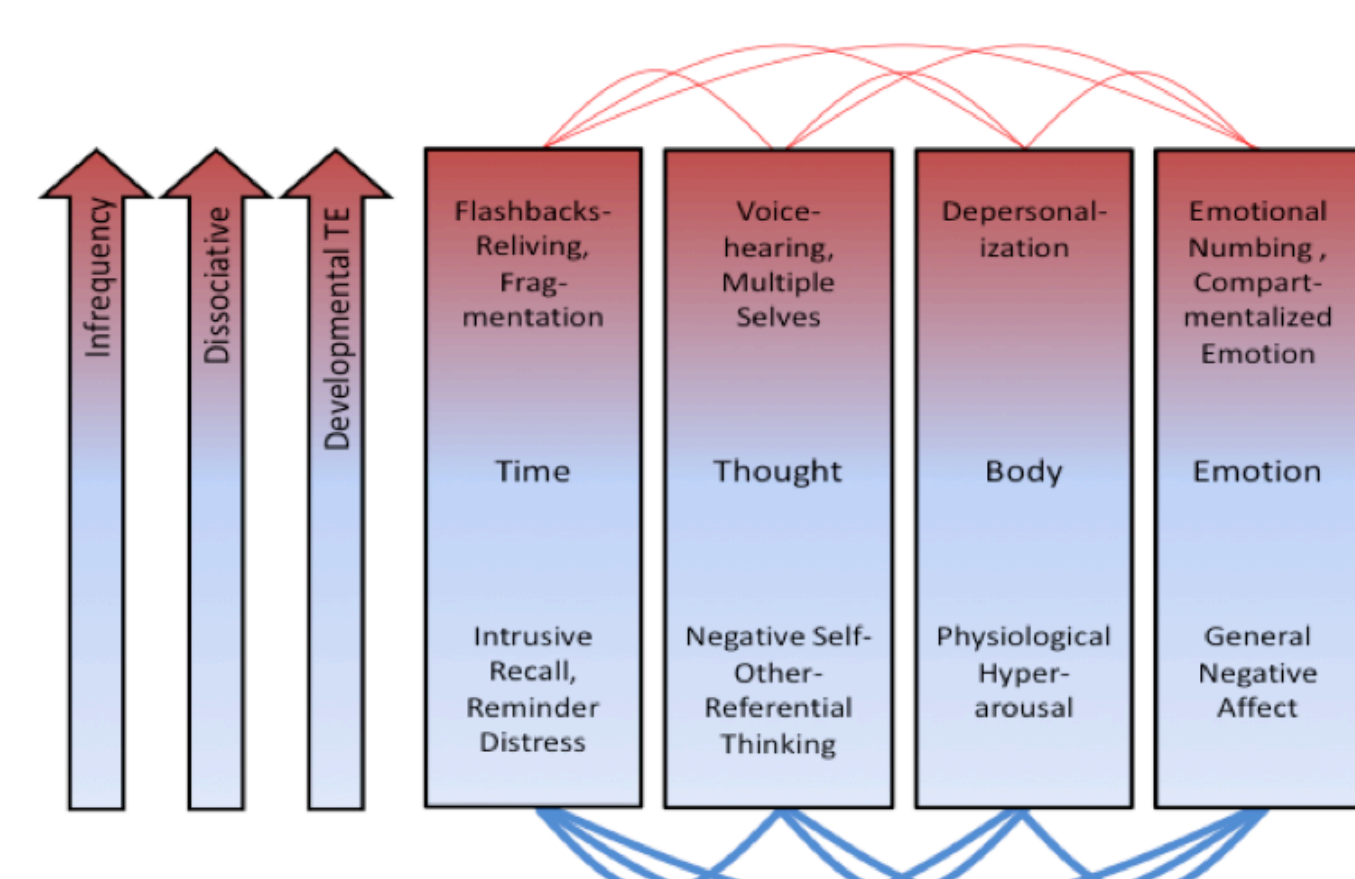


Figure 1. The 4D-Model of Trauma Related Dissociation. NWC symptoms are represented along the bottom of the model in blue, and TRASC symptoms are shown along the top of the model in red. Adapted from “Healing the Traumatized Self: Consciousness, Neuroscience, Treatment” by P. A. Frewen and R. A. Lanius,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

- Hypothesis 1:** NWC symptoms will be endorsed as occurring more frequently on average than TRASC symptoms.
- Hypothesis 2:** Any two NWC symptom dimensions will be more highly intercorrelated than any two TRASC symptom dimensions.
- Hypothesis 3:** TRASC symptoms will be more strongly correlated with trait measures of dissociation compared to NWC symptoms.
- Hypothesis 4:** Symptoms of TRASC will be more strongly correlated with repetitive and developmental forms of traumatic experiences compared to NWC symptoms.

METHODS

Participants

- Undergraduate students ($n = 342$) participated in an online survey for course credit
- Female PTSD Patients ($n = 25$) completed measures at baseline as part of a treatment study

NWC Symptoms Vs. TRASC Symptoms

	NWC	TRASC
Time	Intrusive Memories, and Emotional Upset at Reminders of Trauma ($\alpha = .80$)	Flashbacks
Thought	Negative Self-Referential Processing, Feeling Worthless ($\alpha = .73$)	Hearing Voices
Body	Panic Attacks	Out of Body Experience
Emotion	Depressed Mood, Irritability/Anger, Guilt, Shame ($\alpha = .87$)	Emotional Numbing

Note. Scales without coefficient alpha values were comprised of a single-item only, which prevented calculations of reliability.

Childhood Attachment Relational Trauma Screen (CARTS)

- 69-items that assess relationship quality with various family members, as well as abusive experiences. Response options are dichotomous: yes or no.

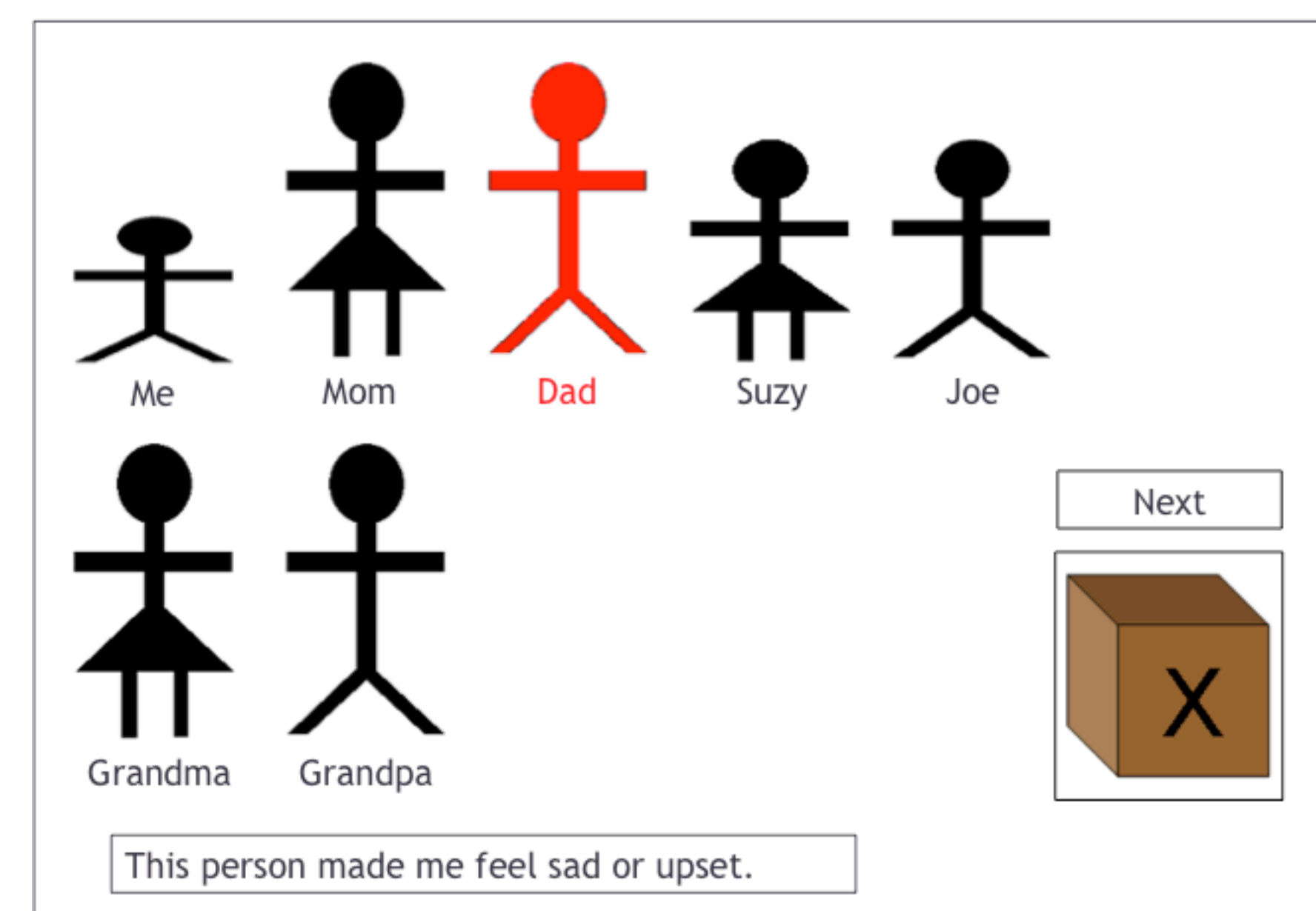


Figure 2. A screen shot of how a participant completes the CARTS. The red figure demonstrates that the participant has selected his/her “Dad” as an individual who made him/her “feel sad or upset”.

Juvenile Victimization Questionnaire (JVQ)

- 36-items assessing various aversive experiences that can occur over the duration of a child’s life (subscale α ’s $\geq .75$).
- Items include experiences of abuse both within and outside the home, and witnessing violence both within and outside the home.
- Responses are made on a scale ranging from 0 (Never) to 5 (5 times or more), which gives an index of severity of trauma history that is not directly assessed by the CARTS.

The Traumatic Dissociation Scale (TDS)

- 24-item self-report scale assessing disruptive dissociative experiences ($\alpha = .98$).
- Does not include items that are indicative of dissociative identity, which are infrequently endorsed. Also does not include items that are considered normative, and endorsed by nearly all participants.
- The TDS does include items that are normally distributed, which are intended to be specific to trauma-related dissociative experiences.
- Scores range from 0 \rightarrow 96 with higher scores indicating greater severity and frequency of dissociative symptoms.

The Dissociative Experiences Scale-Brief (DES-B)

- 8-item self-report measure assessing dissociative experiences ($\alpha = .75$)
- 6-items assess “non-pathological” dissociation, and 2-items assess “pathological” dissociation
- Scores range from 0 \rightarrow 32 with higher scores indicating greater severity and frequency of dissociative experiences

RESULTS

Patient Sample:

- NWC symptoms were endorsed more frequently than TRASC symptoms with the exception of the dimension of Emotion (i.e., negative affect vs. emotional numbing).
- Additional hypotheses of the 4D-Model were not supported:
 - NWC were not more strongly intercorrelated with each other, on average ($M_r = .49, SD_r = .18$) compared to TRASC symptoms ($M_r = .55, SD_r = .01$)
 - Symptoms of TRASC were not more highly correlated with dissociation measures, on average. In addition, TRASC symptoms did not increment prediction of TDS total scores in a two-step multiple regression analysis.
 - Symptoms of TRASC were not correlated stronger with subscales of the CARTS or the Childhood Trauma Questionnaire, in comparison to NWC symptoms.

NWC Symptoms > TRASC Symptoms (Frequency Endorsement)

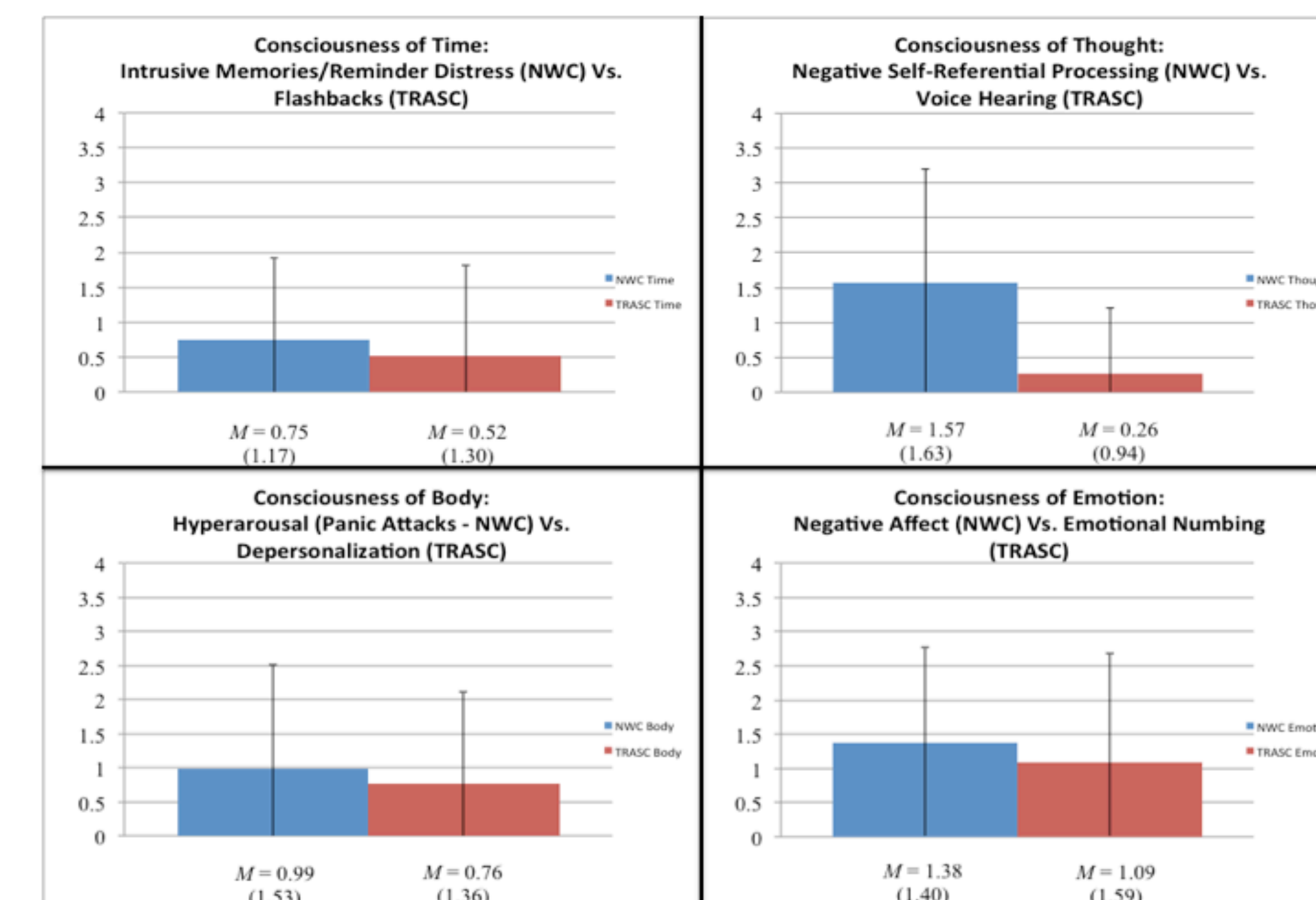


Figure 3. Mean frequency endorsement of NWC symptoms (blue) and TRASC symptoms (red) over the past month. Standard deviations are shown in brackets, and represented by error bars. Labels for specific item endorsement are as follows: 0 = Not at All, 1 = Once, 2 = Two or Three Times, 3 = About Once per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

Any Two Symptoms of TRASC > Intercorrelation than any Two Symptoms of NWC

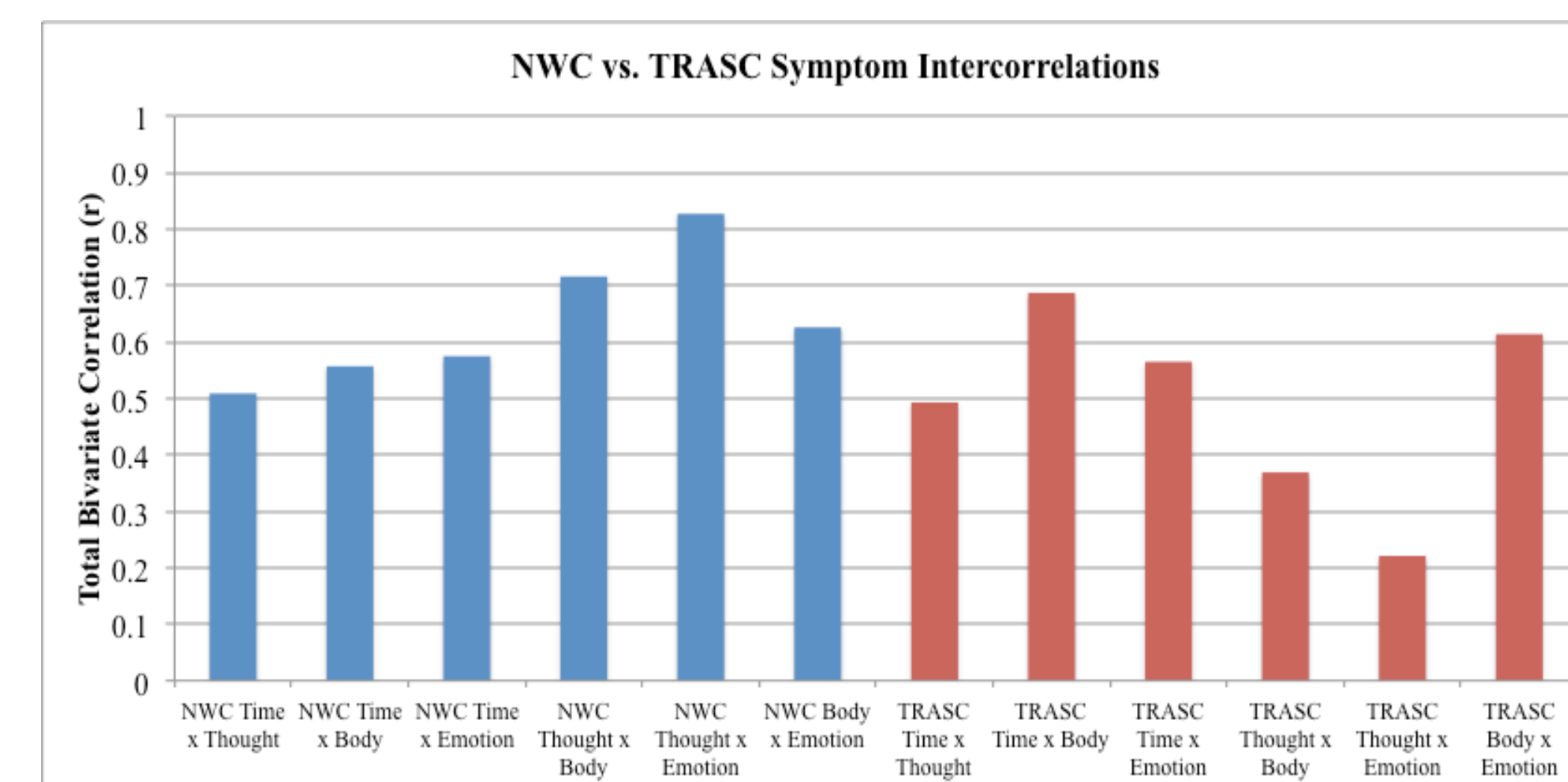


Figure 4. All possible intercorrelations of NWC (blue) and TRASC symptom dimensions (red) respectively. Overall, NWC symptoms were more strongly intercorrelated ($M_r = .64, SD_r = .11$) than TRASC symptoms ($M_r = .56, SD_r = .21$).

Symptoms of TRASC correlated > with Trait Measures of Dissociation

- Symptoms of TRASC were more highly correlated with TDS scores ($M_r = .43, SD_r = .03$) than were NWC symptoms ($M_r = .37, SD_r = .05$); however, this difference was non-significant.
- Symptoms of both NWC and TRASC were weakly correlated with DES-B scores, r ’s $< .15$. Only TRASC of Body and Emotion were significantly correlated ($r = .15, p < .05$).
- Importantly, symptoms of TRASC significantly incremented in prediction of TDS scores over NWC symptoms ($\Delta R^2 = .14, \text{total } R^2 = .52, p < .001$).
- However, the reverse was not true, NWC symptoms did not increment over TRASC symptoms in predicting TDS variance.
- NWC and TRASC symptoms did not increment over each other in prediction of DES-B total scores.

RESULTS

TRASC symptoms correlated > with Repetitive and Developmental Trauma

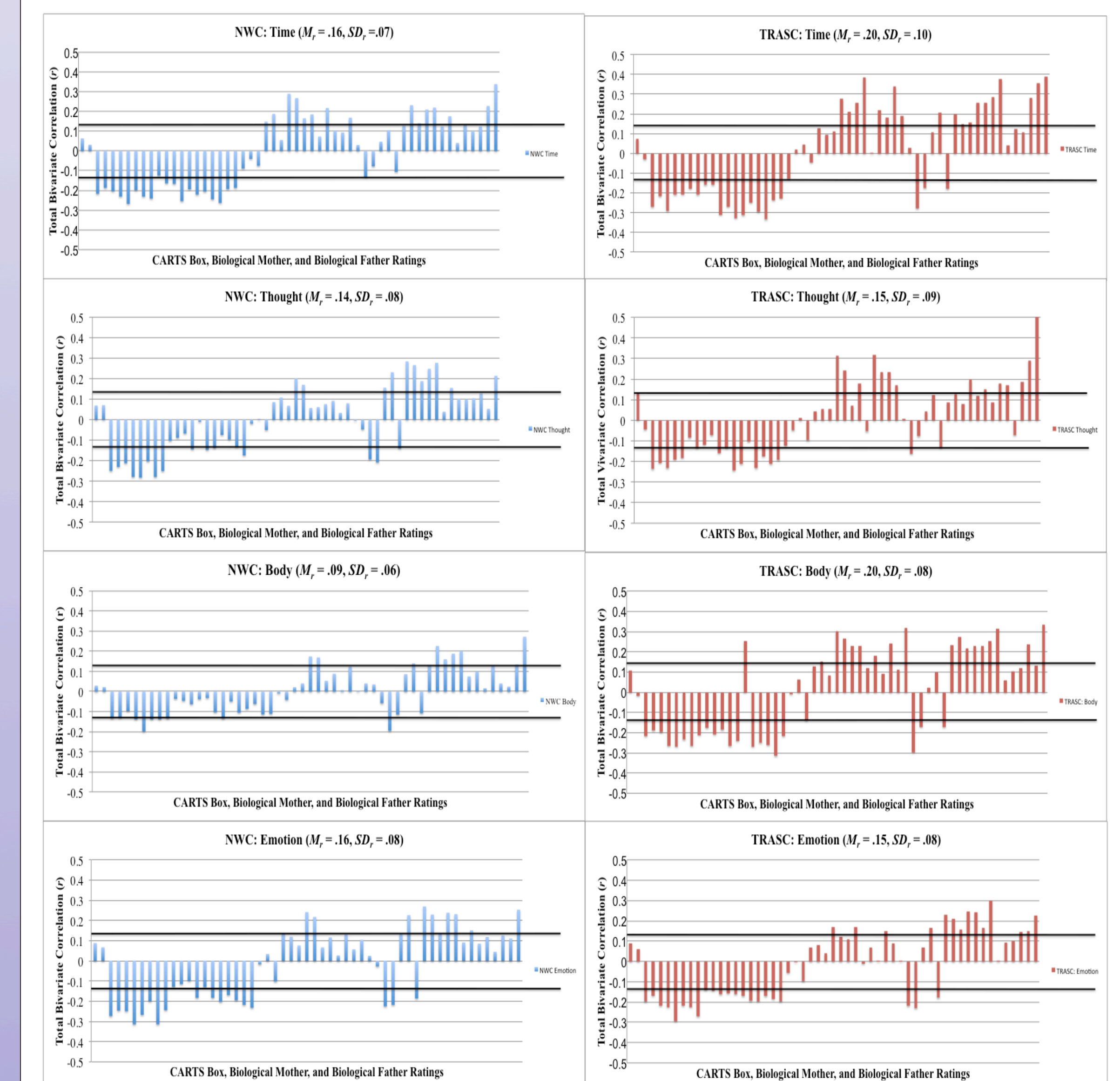


Figure 5. Pearson correlation-coefficients between symptoms of NWC and TRASC and the 20 Box subscales, 19 Mother subscales, and 19 Father subscales. Solid black lines represent critical r -values at $p = .001$ for a sample size of 300. Correlation coefficients surpassing this line represent significant correlations. Correlations stronger in TRASC vs. NWC only for the Body dimension ($p < .05$).

DISCUSSION

- Overall, the structure and hypotheses of the 4D-model were supported within the student sample, although discrepancies were found within the patient sample.
- A novel finding was that TRASC symptoms were significantly correlated with several forms of early childhood trauma as assessed via the CARTS.
 - Previous research found that only TRASC of Thought (i.e., voice hearing) was related to sexual abuse.
- Hypotheses 2-4 were not supported within the patient sample, which contrasts with a recent publication testing the 4D-Model within a sample of 74 PTSD patients (Frewen & Lanius, 2014).
 - The primary reason for the findings of the current study is likely due to low statistical power, as the sample size was small.
- Although symptoms of TRASC were significantly associated with developmental and repetitive forms of trauma, as assessed via the CARTS, only for the dimension of Body (e.g., depersonalization) was this association significantly different compared to NWC symptoms.
 - Could be a true effect in which out-of-body experiences are differentiated from states of physiological arousal on the basis of association with early traumatic events.
 - A single-item may be insufficient to account for the variance of embodied displays of anxiety.
- Limitations:
 - Base rates of abusive experiences, especially sexual abuse, were very low in the student sample, which may have artificially inflated the strength of correlations between these experiences and psychological symptoms.
 - Self-report of NWC and TRASC symptoms was based on the frequency of symptoms over the past month, which may not be a sensitive enough time interval to examine differences in intercorrelations between dimensions.
- Future research would benefit by using measures with standardized cutoff scores for experiencing particular forms of abuse, allowing for the examination of different groups exposed to different levels of severity of maltreatment.
 - This would allow for the examination of whether TRASC symptoms are more specific to repetitive and developmental forms of childhood abuse, whereas NWC symptoms are more sensitive to maltreatment experiences in general.
- Future research must account for both attachment and relational experiences, as well as abusive experiences, when examining causes, correlates, and outcomes of PTSD and dissociative experiences related to childhood maltreatment.
- Providing validity for the 4D-Model has the potential to inform current assessment and treatment practices by expanding the current definition of traumatic dissociation from that of depersonalization, to also including symptoms such as flashbacks, voice hearing, and emotional numbing.