

Understanding Emotional Experiences and Partner Relationships Among Individuals with
Psychogenic Non-Epileptic Seizures

by

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ABSTRACT

Individuals with psychogenic non-epileptic seizures (PNES) show signs of emotion-related dysfunction and disrupted interpersonal relationships. Affectionate touch is an important form of non-verbal communication in relationships that may foster emotion regulation and emotional awareness. The present online survey study included 62 individuals with PNES and 80 seizure-free trauma-exposed controls high ($n=40$) or low ($n=40$) in overall symptoms of psychopathology. As hypothesized, PNES individuals reported experiencing less frequent affectionate touch and less interoceptive awareness than either control group. They also reported more somatic symptoms, more emotion regulation difficulties, and less positive emotion than the low psychopathology group. Unexpectedly, there were no group differences in emotional awareness difficulties, nor in initiation of affectionate touch. Across participants, lower interoceptive awareness was associated with lower affectionate touch frequency, indicating that if one has difficulty understanding and being aware of their own body, affectionate touch sensations may not necessarily be understood as pleasant and may be minimized or avoided. Emotional awareness difficulties surprisingly were associated with greater affectionate touch frequency among PNES (versus the expected pattern of awareness difficulties associated with less affectionate touch, as found among controls), suggesting affectionate touch may be used as an attempt to try and understand one's own feelings, or to compensate for, or even mask a lack of understanding. Findings indicate a distinct difference in physical affection frequency and interoceptive awareness among PNES individuals even when matched to a group similar in psychiatric distress/psychopathology. These findings offer

insight into the relationships between interoceptive awareness, affectionate touch, and emotion regulation more broadly.

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Understanding Emotional Experiences and Partner Relationships Among Individuals with Psychogenic Non-Epileptic Seizures

Social relationships are important for both physical and mental health; romantic relationships in particular are indicative of one's well-being and health outcomes (Gomez-Lopez, Viejo, & Ruiz, 2019). Emotions play a key role in interpersonal relationships, and the way emotions are recognized, regulated, and expressed is likely to affect interpersonal relationships, such as with romantic partners (English, Oliver, & Gross, 2013). In interpersonal relationships, affectionate touch is an important form of non-verbal communication and can promote emotional and physical well-being as well as emotion regulation (Jakubiak & Feeney, 2017), potentially via direct interoceptive input because affectionate touch may change how the body feels (Burlison & Quigley, 2020). However, there is no evidence as to how individuals with psychogenic non-epileptic seizures (PNES) experience affectionate touch or its frequency. PNES is associated with signs of emotion-related dysfunction, past trauma, high attention to and possible misunderstanding of physical sensations, and disrupted interpersonal relationships. The present study examines these and related social-emotional processes in PNES.

Specifically, this project focuses on affectionate touch, which has implications for relationships and health, but has not been studied in the context of non-epileptic seizures.

PNES: Definition

PNES resemble epileptic seizures on the surface but occur without the abnormal electrical brain activity that characterizes epileptic seizures. PNES is often misdiagnosed as epilepsy in terms of the symptoms appearing seizure-like (e.g., shaking, flailing, loss of consciousness) but does not follow the same underlying biological process; there is no

evidence of epileptic activity on an EEG (Devinsky, Gazzola, & LaFrance, 2011). PNES is not uncommon, as it is seen in 20-30% of patients in epilepsy units (Benbadis & Hauser, 2000). Instead, PNES has been considered a conversion or somatic symptom disorder – currently also described as a “functional neurological disorder” – in which physical symptoms, such as seizure-like behaviors occur due to psychological distress rather than a known medical cause (APA, 2013).

PNES and Emotion Processing

PNES is thought to stem from psychological and emotional causes in which involuntary seizures occur as a protective reaction to stress (Brown & Reuber, 2016). Current theories suggest that PNES reflects an intersection of deficits in emotional processing and interoceptive awareness (in addition to deficits in other processes such as attention and agency; Drane et al., 2020). PNES patients lack insight into psychological causes for their distress and show deficits in emotional processing (Novakova et al., 2015). When compared to patients with psychosomatic conditions such as chronic pain, individuals with PNES were similar in terms of having strong tendencies to suppress emotions and avoiding situations that evoke strong emotions (Novakova et al., 2015). Impaired emotion processing was also correlated with higher levels of psychological distress. This finding provides evidence of a recurring relationship demonstrated in the literature: individuals with PNES experiencing high levels of emotional distress also have a greater tendency to avoid strong or painful emotions but, as the authors suggest, the ability to process these emotions is not developed and their distress continues to build (Novakova et al., 2015).

Evidence also indicates that individuals with PNES struggle to regulate emotions (Williams, Levita, & Reuber, 2018). Emotion regulation, which can be defined as managing/influencing one's emotions and emotional response (Gross, 1998), also includes the awareness, understanding, and acceptance of emotions, as well as the capability to reduce impulsive behavior in order to attain one's particular goals, and having access to appropriate emotion regulation strategies (Gratz & Roemer, 2004). PNES individuals have also demonstrated limitations in emotional awareness (Uliaszek, Prensky, & Baslet, 2012) and emotion recognition (Zeng, Myers, & Lancman, 2018). These findings have not only been found in self-reports but also in physiological measures, as PNES individuals have shown to have a lower baseline respiratory sinus arrhythmia (Roberts et al., 2012) which has been linked with a compromised capacity to regulate emotions (Bylsma et al., 2014). General emotion regulation difficulties, as seen with PNES individuals, have similarly been seen in other populations who exhibit clinical symptomatology such as borderline personality disorder (Kuo & Linehan, 2009), depression (Compare et al., 2024), and PTSD (Roberts et al., 2012).

Uliaszek and colleagues (2012) have identified subgroups showing either emotion regulation difficulties or a lack of emotional awareness. The subgroups have been clustered as Cluster 1, in which individuals report high emotion dysregulation and may be prone to additional clinical comorbidities such as depression, anxiety, and borderline personality disorder distress (Brown et al., 2013; Uliaszek et al., 2012), and Cluster 2 in which they report low emotion dysregulation. For individuals in Cluster 2, self-reports indicate they believe they are emotionally healthy. However, they are more avoidant of emotions and unaware of their emotional or psychological distress (Brown et al., 2013;

Uliaszek et al., 2012), indicating that it is relevant, particularly within the PNES population, to examine emotion regulation and emotional awareness as two separate processes.

PNES, Somatic Symptoms, and Interoception

The way in which emotions are experienced and regulated is important in differentiating emotions from other physical sensations (Chen et al., 2011). Deficits in emotional awareness and processing may lead to an increase in somatic symptoms (i.e., medically unexplained symptoms, such as gastrointestinal issues, chest pain, or difficulty breathing, that are attributed to psychological distress; Okur Guney et al., 2019). Patients with PNES tend to attribute their emotional difficulties and seizure-like symptoms to somatic (physical) rather than psychological reasons (Stone, Binzer, & Sharpe, 2004; Whitehead, Kandler, & Reuber, 2013) and focus on the physicality of their symptoms (Brown & Reuber, 2016; Roberts et al., 2012). Individuals with PNES have also reported more physical symptoms of anxiety and depression and experienced more frequent unexplained somatic symptoms when compared to individuals with epilepsy (Testa et al., 2011). In comparison to trauma controls with relatively higher and lower levels of posttraumatic stress (PTS high and PTS low), PNES patients did not differ from the PTS high group on emotion regulation or clinical symptoms (e.g., depression and anxiety), but did report more somatic symptoms (Roberts et al., 2012).

Given the seemingly greater attention to somatic symptoms, and potential over-interpretation of physical sensations as distressing among those with PNES (Fobian, Long, & Szaflarski, 2020), interoceptive awareness has become a key process of interest in PNES (Drane et al., 2020). Interoceptive awareness is the recognition of physical

sensations inside the body, which is related to, but distinct from emotional awareness (Critchley et al., 2004). As proposed in Brown and Reuber (2016), possible disruptions in interoceptive processing may lead PNES patients to pay greater attention to or misinterpret bodily signals, which perhaps manifests in more somatic symptoms. Alterations in both emotional awareness and interoceptive awareness may occur simultaneously. However, whether imprecise or amplified interoception is influencing this phenomenon is unclear (Jungilligens et al., 2019). Individuals with PNES have shown sensory sensitivity and tendencies to avoid such sensory experiences including tastes, smells, visuals, auditory, touch, movements, and certain levels of activity (Ranford et al., 2020). As discussed below, this sensory sensitivity in PNES, along with disruptions in typical emotion and interoception-related processing, perhaps extends into the experience of close relationships, especially with respect to physical (affectionate) touch.

PNES and Close Relationships

As previously stated, emotion regulation and awareness is important for relationship functioning (English et al., 2013). Disruptions in emotional and interoceptive processing may increase distress thus affecting interpersonal relationships. There is evidence suggesting individuals with PNES may experience greater relationship conflict. Krawetz and colleagues (2001) found that patients with PNES were unable to effectively resolve conflicts with family members; there were difficulties in areas of emotional involvement and communication within the family as patients with PNES struggled to verbally express their feelings and needs. Green and colleagues (2017) also found a positive association between depression and relationship conflict in a sample with PNES. There were no significant differences in relationship quality scores between PNES and

epilepsy, but the associations between relationship quality scores and anxiety were stronger in the PNES group (Green et al., 2017).

Previous studies have examined attachment and the influence that families have on PNES patients' quality of life as patients who perceived their family environment as critical, unsupportive, and disinterested were found to have lower health-related quality of life (LaFrance et al., 2011). However, research has not focused on relationship quality or behavioral and affective exchanges within romantic relationships, such as reported affectionate touch behaviors.

Affectionate Touch

Affectionate touch is one characteristic of relationships that not only aids in relationship satisfaction and well-being but also in increasing positive mood (Debrot et al., 2013), reducing stress (Ditzen et al., 2007; Jakubiak & Feeney, 2016), and predicting health (Field, 2010; Cohen et al., 2015). There are certain buffering effects of affectionate touch. Touch from one's partner has shown to protect against maladaptive emotion regulation such as suppression (Debrot et al., 2013). And, touch has shown to be associated with less daily stress as evidenced by decreases in cortisol levels (Ditzen, Hoppman, & Klumb, 2008). In a study by Cohen and colleagues, individuals who received more hugs also had less susceptibility to colds, and, if infected, showed less severe symptoms (2015). Furthermore, receiving or imagining touch buffered against stress reactivity in a cold pressor task aimed to induce physical stress more so than receiving or imagining verbal support (Jakubiak & Feeney, 2016).

Both giving and receiving affectionate touch has shown to decrease negative affect and increase positive affect mood (Debrot et al., 2013) even within the same day

(Burleson, Trevathian, & Todd, 2007). Increasing positive affect has been shown to help build and maintain relationships (Shiota, et al., 2004) as well as increase intimacy. The study by Debrot and colleagues reveals that when experiencing touch with partners, there is also an experience of closeness and being more intimate, which is associated with more positive affect (2013). Interestingly, even if a partner indicated not feeling any closer, there was still a significant direct relationship of touch with greater positive affect (Debrot et al., 2013).

Somatic Symptoms, Interoception, and Affectionate Touch

There is limited research on the protective effect that affectionate touch may have on somatic symptoms. In a daily diary study examining physical affection and somatic symptoms, as affectionate touch increased, somatic symptoms decreased in the days thereafter (Stadler et al., 2012). There was no evidence that more somatic symptoms led to a decrease of affectionate touch, however. One explanation given by the authors is that affectionate touch has the potential to move attention away from interoceptive processing and somatic symptoms while improving relationship satisfaction, support, and increasing mood and positive affect. It should be noted (as the authors of this study suggest) that the sample was comprised of healthy individuals. In individuals where somatic symptoms or certain clinical or affective disorders are influencing relationship functioning, such as PNES, it would be reasonable to expect that an increase in somatic symptoms would lead to decreased physical affection (Stadler et al., 2012).

PNES and the Role of Trauma and Clinical Comorbidities

Abnormalities in emotion processing have been associated with the development of psychological disorders that co-occur with PNES, such as PTSD (Rachman, 2001),

depression (Compare et al., 2014), and other psychosomatic illnesses (Coughlin Della Selva, 2006). Therefore, understanding emotion processing deficits specific to PNES requires comparing PNES to clinical control groups. Most studies of PNES to date, however, have compared PNES, epilepsy, and healthy controls. Relatively fewer studies have included clinical control groups; of those that have, the focus has been on the effects of trauma exposure and PTSD symptoms. For example, studies have compared PNES with trauma-exposed controls with higher and lower PTSD symptoms (Roberts et al., 2012; Roberts et al., 2020), and have compared those with PNES plus PTSD to those with PNES alone (Myers et al., 2014). This research suggests that some emotion-related deficits in PNES are partly or primarily accounted for by a diagnosis of PTSD or other trauma-related psychological factors, including threat processing (Bakvis et al., 2009), self-reported emotion regulation difficulties (Roberts et al., 2012, Roberts et al., 2020), and maladaptive emotion-focused coping (Zeng et al., 2018). Studies have also found that when comparing PNES, epilepsy, and healthy controls, symptoms of depression and anxiety account for group differences (e.g., in alexithymia; Bewley et al., 2005).

Depressive and anxiety symptoms, which may be comorbid with PNES, contribute not only to dysregulation of emotions, but also to relationship interactions (Zaider, Heimberg, & Iida, 2010). While there is an inadequate literature examining PNES and partner relationships, including how they experience affection, intimacy, and happiness in these relationships, an extensive literature indicates that mental health conditions can have a significant negative impact on relationships (Whisman, Sheldon, & Goering, 2000).

Those with PNES show characteristics associated with instability in relationships (e.g., borderline personality disorder; Lacey, Cook & Salzberg, 2007) that may lead them to desire affectionate touch and yet in actuality perhaps *seek* less. Triscoli and colleagues (2019) found that while highly depressed individuals reported more negative attitudes about social touch and a dislike toward physical touch by strangers or less well-known individuals, they had positive thoughts about affectionate touch from close individuals and indicated wanting to be embraced to the same extent that participants with low or no depression also reported. Given these findings, the potential for somatic symptoms to interfere with affectionate touch as described above, and the fact that individuals with PNES have shown diminished positive affect (Roberts et al., 2012) and difficulty experiencing happiness (Roberts et al., 2020), it is possible that those with PNES might also experience lower frequency of affectionate touch in their relationships and initiate touch to a lesser extent.

Present Study

The present study examines whether individuals with PNES seek and experience less affectionate touch in their partner relationships than trauma-exposed controls and how this is related to self-reported somatic symptoms, interoceptive awareness, emotional awareness, emotion regulation, and positive affect. It is hypothesized that (H1) PNES individuals will report lower frequency of affectionate touch and will be less likely to initiate touch in their partner relationships than trauma-exposed controls high or low in general psychopathology; (H2) PNES individuals will report (a) higher levels of somatic symptoms, (b) lower interoceptive awareness, (c) greater difficulties with emotional awareness and (d) emotion regulation, and (e) less positive affect than trauma-exposed

controls high or low in general psychopathology. Finally, it is hypothesized that (H3) frequency of affectionate touch will be predicted by higher levels of somatic symptoms, lower interoceptive awareness, more difficulties in emotional awareness, more difficulties in emotion regulation, and lower positive affect. These relationships are expected to be consistent across groups; however, exploratory comparisons will be conducted to investigate whether these predictors of affectionate touch frequency differ between PNES and controls (with the high and low psychopathology groups combined for this exploratory analysis).

This research aims to gain further insight from patients with PNES about the relationships among emotion- and sensory-related processes and affectionate touch. By including trauma-exposed control groups high and low in psychopathology, it will be possible to learn about these processes and to isolate to a greater extent the effects of PNES specifically from exposure to trauma and from psychopathology more broadly.

Method

Participants

The sample was comprised of 62 PNES patients and 80 seizure-free trauma-exposed controls reporting high ($n = 40$) or low ($n = 40$) levels of psychological distress/psychopathology symptoms. See Table 1 for sample characteristics. PNES participants were recruited from social media organizations including FNDHope.org, the Northeast Regional Epilepsy Clinic Facebook and Twitter pages, and via e-mailed flyers to PNES patients from Banner-University Medical Center in Phoenix. We did not have formal diagnoses based on EEG recordings; rather, participants were included in this study based on self-reporting a diagnosis or suspected diagnosis of PNES. However, participants were

asked (as part of the online survey) (a) if they have had an EEG recording in the past, and (b) if the EEG results indicated epilepsy. Three participants were excluded from the PNES group due to a suspected diagnosis of epilepsy as per their answers to these questions.

Trauma-exposed controls were recruited from Arizona State University's research participation pool (using Sona Systems research participation management software) by recruiting participants who "have experienced one or more very stressful or traumatic life events (e.g., sudden loss of a loved one, major accident, childhood trauma)." We initially encouraged participation from those ages 26 or older and in a partner relationship, in order to match to the anticipated demographics of our PNES group. Of the participants recruited for the trauma control group, 5 did not have a traumatic event per the questionnaires and were excluded; the remaining 80 who filled out the survey endorsed having experienced/witnessed one or more traumatic events per the Adverse Life Events checklist (Gray et al., 2004) and as defined by DSM-5.

Trauma-exposed controls were divided into two groups based on their median Symptom Checklist (SCL)-53 Global Severity Index (GSI) score, which is an average score of all 53 items and reflects overall general psychiatric distress or symptoms of psychopathology. Any participants scoring at or above the median GSI score of .75 were categorized as high psychopathology (hi-psychopathology) and scores below the median (.74 or below) were categorized as low psychopathology (lo-psychopathology).

Procedure

Participants completed the 2-hour survey in SurveyMonkey. Interested participants who clicked on the survey link were presented with a consent form; clicking

“accept” to proceed to the survey was considered consent. All procedures were approved by the university’s Institutional Review Board and complied with APA ethical guidelines. The first 50 PNES participants were compensated via \$35.00 giftcards to Amazon.com and subsequent PNES participants were entered into a drawing for one of four \$35 giftcards. Trauma-exposed controls were given 4 research credits for their participation in this study.

Measures

The survey included measures to assess physical (somatic) symptoms, interoceptive awareness, emotion regulation/awareness, positive affect, frequency of physical affection, and initiation of affectionate touch, along with other measures not pertinent to the present study.

Demographics. Age, gender, racial/ethnic background, education level, socioeconomic status, marital/relationship status, and employment status were collected.

Posttraumatic stress. PTSD Checklist for DSM-5 (PCL-5): 20 items measuring the extent in which participants were bothered by symptoms due to a traumatic event, rated on a 5-point Likert Scale, anchored by 0 “not at all” and 4 “extremely” (Blevins, Weathers, Davis, Witte, & Domino, 2015). (Cronbach’s α : PNES = .94, hi-psychopathology = .92, lo-psychopathology = .93).

Psychiatric Distress (Psychopathology). General psychiatric distress (which we also refer to here as “psychopathology”) was measured using the Symptom Checklist 53 (SCL-53; Derogatis & Fitzpatrick, 2004). Items are rated on a 5-point Likert scale anchored by 0 “not at all” and 4 “extremely.” The SCL-53 has 9 subscales for symptom dimensions: depression, anxiety, obsession-compulsion, interpersonal sensitivity,

hostility, phobic anxiety, paranoia, psychoticism, and somatic (the latter is described below). The Global Severity Index (GSI) is the average of all items (i.e., reflecting the 9 symptom dimensions), with higher scores reflecting greater distress or symptoms of psychopathology. (Cronbach's α : PNES = .98, hi-psychopathology = .93, lo-psychopathology = .81).

Somatic Symptoms. Somatic symptoms were measured using the subscale of the Symptom Checklist 53 (SCL-53; Derogatis & Fitzpatrick, 2004): 8 items measuring intensity of somatic (physical) symptoms were rated on a 5-point Likert scale anchored by 0 “not at all” and 4 “extremely.” (Cronbach's α : PNES = .88, hi-psychopathology = .78, lo-psychopathology = .06). (It is unclear why reliability was so poor for the lo-psychopathology group, but it may be due to the fact that most ratings were 0 or 1, with scattered higher ratings.)

Interoceptive Awareness. Eight items were administered from the 32-item Multidimensional Assessment of Interoceptive Awareness (MAIA) scale (Mehling et al., 2018). These 8 items reflect two subscales: body noticing (3 items) and emotional awareness (5 items). Although the name of one of the subscales is “emotional awareness,” we refer to it as “interoceptive awareness” throughout the present paper, because items focus on noticing body changes (e.g., “I notice how my body changes when I am angry”), along with the body listening subscale (“When I am upset, I take time to explore how my body feels.”). Ratings were made on a 6-point Likert scale anchored by 0 “never” and 5 “always”. Items were averaged. Higher scores reflect greater interoceptive awareness. (Cronbach's α across all 8 items: PNES = .87, hi-psychopathology = .85, lo-psychopathology = .90).

Emotion Regulation and Emotional Awareness. Difficulties in Emotion Regulation Scale (DERS)- short form: 18 items measuring the levels of difficulty in each of 6 emotion regulation dimensions (e.g., ability to engage in goal-directed behavior when upset; ability to control impulses when upset) (Gratz & Roemer, 2004). One of the six subscales is an emotional awareness subscale, which is comprised of 3 items (I pay attention to how I feel; I am attentive to my feelings; When I'm upset, I acknowledge my emotions) and was examined separately. An overall emotion regulation difficulties total score was computed by averaging 15 of the 18 items; the 3 items from the emotional awareness subscale were excluded. Ratings were on a 5-point Likert scale anchored by 0 "almost never" and 4 "almost always". Higher scores reflect greater difficulties with emotion regulation (full scale) or greater emotional awareness difficulties (subscale). Difficulties in emotion regulation (Cronbach's α : PNES = .93, hi-psychopathology = .91, lo-psychopathology = .83). Difficulties in emotional awareness (Cronbach's α : PNES = .90, hi-psychopathology = .88, lo-psychopathology = .87)

Positive Affect. Positive and Negative Affect Schedule (PANAS): 20 items that comprise two mood scales, one measuring positive affect and the other measuring negative affect (Watson, Clark, & Tellegen, 1988). Items are rated on a 5-point Likert scale anchored by 0 "not at all" to 5 "extremely". This study focused only on the 10-item positive affect subscale (Cronbach's α : PNES = .91, hi-psychopathology = .89, lo-psychopathology = .91).

Frequency of Physical Affection. Physical Affection Scale (PAS): 8 romantic relationship questions adapted from Diamond (2000), and 3 childhood questions adapted from the Childhood Support Scale by Barber and Thomas (1986) measuring the

frequency of physical touch with partner. Items are rated on a 5-point Likert scale anchored by 0 “never” and 4 “almost daily”. The sexual intercourse item was excluded. (Cronbach’s α : PNES = .92, hi-psychopathology = .83, lo-psychopathology = .75).

Initiation of Physical Affection. Using a 0 (strongly disagree) to 6 (strongly agree) scale, this single item asked participants to rate the extent to which they initiate affectionate touch in their relationship. This item was developed for the present study.

Data Analysis

Univariate between-subjects analyses of variance (ANOVAs) and chi-square tests were used to examine group differences in demographics and clinical and relationship characteristics, including posttraumatic stress symptoms, depression, anxiety, and relationship quality. Univariate between-subjects ANOVAs also were used to test the hypothesized group differences in (H1) frequency of affectionate touch and initiation of affectionate touch, and (H2) somatic symptoms, interoceptive awareness, difficulties in emotional awareness, difficulties in emotion regulation, and positive affect. Bonferroni test corrections were used due to the increase in familywise error rates with multiple comparisons (Lee & Lee, 2018). Eta squared values as a measure of effect size are reported in Table 1 and Table 2.

A hierarchical linear regression was used to examine whether (H3) higher somatic symptoms, lower interoceptive awareness, greater difficulties in emotional awareness, greater difficulties in emotion regulation, and lower positive affect predicted lower frequency of affectionate touch. These were entered as simultaneous predictors with affectionate touch frequency as the outcome. It was hypothesized that these emotion-related variables individually and collectively would predict affectionate touch frequency

across groups; however, to explore the possible moderating effects of group on these relationships, Group (PNES coded as '1' and all controls coded as '0') was entered on Step 2, and the interaction terms between Group and each predictor were entered on Step 3. All predictors were mean-centered prior to computing interaction terms. For the regression analyses, unstandardized and standardized beta coefficients, confidence intervals, standard errors, and R squared are reported.

Results

Descriptive Results

As noted above, sample characteristics are presented in Table 1. The PNES and hi-psychopathology groups were matched on symptoms of overall psychopathology as well as symptoms of posttraumatic stress, depression, and anxiety, with both groups reporting more symptoms than the lo-psychopathology group. Groups did not differ in age, education, or income. There were a number of other demographic differences, however, with the PNES group including more females versus males, white versus non-white participants, and single versus partnered individuals (all controls were in a relationship) than one or both control groups (see Table 1).

Descriptive statistics for all major study variables are presented in Table 2.

Correlations among Variables

Bivariate correlations between the study variables are presented for all participants and for each group in Table 3.

Frequency of Affectionate Touch

There were group differences in frequency of affectionate touch ($F(2,113) = 5.31$, $p = .01$), and the hypothesis that individuals with PNES would report lower frequency of

affectionate touch was supported. PNES individuals reported significantly lower frequency of affectionate touch ($M = 3.04$, $SD = 1.02$) than the hi-psychopathology group ($M = 3.55$, $SD = .50$, $p = .01$) and the lo-psychopathology group ($M = 3.45$, $SD = .55$, $p = .03$). There was no significant difference between the two control groups ($p = 1.00$).

Initiation of Affectionate Touch

It was predicted that individuals with PNES would report being less likely to initiate affectionate touch in their partner relationships in comparison to both control groups. However, there were no significant differences among groups regarding affectionate touch initiation ($F(2,114) = 1.31$, $p = .27$).

Somatic Symptoms

In examining somatic symptom distress, there was a statistically significant difference among the three groups ($F(2,122) = 34.64$, $p < .001$). Individuals with PNES ($M = 1.63$, $SD = 1.06$) and individuals in the hi-psychopathology group ($M = 1.39$, $SD = .95$) each reported significantly higher somatic symptom distress than the lo-psychopathology group ($M = .20$, $SD = .20$) ($ps < .001$). There was no significant difference between the PNES individuals and the hi-psychopathology group, however ($p = .54$).

Interoceptive Awareness

A significant difference was found among groups in interoceptive awareness ($F(2,119) = 6.12$, $p = .003$). Individuals with PNES reported significantly lower interoceptive awareness ($M = 2.81$, $SD = 1.21$) than both the hi-psychopathology group ($M = 3.60$, $SD = .99$, $p = .004$) and the lo-psychopathology group ($M = 3.47$, $SD = 1.09$, $p = .02$). There was no significant difference between the control groups ($p = 1.00$).

Difficulties in Emotional Awareness and Emotion Regulation

It was predicted that individuals with PNES would report greater difficulties in emotional awareness. The ANOVA results did not indicate a significant difference among the three groups, however ($F(2,118) = 1.27, p = .29$).

The ANOVA results indicated significant overall differences between the three groups in emotion regulation difficulties ($F(2,118) = 15.37, p < .001$). As hypothesized, individuals with PNES reported significantly greater difficulties in emotion regulation ($M = 2.51, SD = .93$) in comparison to the lo-psychopathology control group ($M = 1.72, SD = .48, p < .001$) but did not differ from the hi-psychopathology control group ($M = 2.56, SD = .81, p = 1.00$). There was also a significant difference between the control groups such that the hi-psychopathology group reported significantly higher difficulties in emotion regulation than the lo-psychopathology group ($p < .001$).

Positive Affect

There were significant group differences in positive affect ($F(2,122) = 8.34, p < .001$). The PNES group reported significantly lower positive affect than the lo-psychopathology group ($M = 2.95, SD = .91, M = 3.68, SD = .79, p < .001$) but not the hi-psychopathology group ($M = 3.26, SD = .76, p = .24$). The hi-psychopathology group showed a non-significant trend toward lower positive affect than the lo-psychopathology group ($p = .08$).

Prediction of Affectionate Touch Frequency

To test the hypothesis that lower frequency of affectionate touch is predicted by higher levels of somatic symptoms, lower interoceptive awareness, greater difficulties in emotional awareness, greater difficulties in emotion regulation, and less positive affect, a

hierarchical regression was performed in which each predictor was mean centered and entered at Step 1 with affectionate touch frequency as the outcome. To explore possible group differences in predictors of affectionate touch frequency, a variable reflecting group membership was added at Step 2 (coded: PNES individuals = 1, trauma-exposed controls [hi- and lo-psychopathology combined] = 0), and variables reflecting the interaction of group membership and each of the predictors were added at Step 3.

At Step 1 of the analysis, 17.6% of the variance in frequency of physical affection was accounted for by somatic symptoms, interoceptive awareness, difficulties in emotion regulation, difficulties in emotional awareness, and positive affect ($F(5,103) = 4.41, p < .001$). Examination of individual predictors revealed that interoceptive awareness was positively associated with frequency of physical affection ($b = 0.31, SE = .07, t(103) = 4.21, p < .001$); difficulties in emotional awareness was associated with *greater* affection ($b = 0.16, SE = .08, t(103) = 2.00, p = .048$); and somatic symptoms, difficulties in emotion regulation, and positive affect were not associated with frequency of physical affection (although the former two became significant when Group and its interactions were also included on Step 3; see Table 4). There was a significant increase in the proportion of variance in physical affection frequency accounted for when moving from Step 1 to Step 2, $\Delta R^2 = .05, F(1, 102) = 6.08, p = .015$. At Step 2, there was a significant Group effect, with PNES reporting less affection (again, coded as 1 and mean-centered) than controls (coded as 0 and mean-centered; $b = -0.40, SE = 0.16, t(102) = -2.47, p = .015$). In moving from Step 2 to Step 3 of the model, there was a significant increase in the proportion of variance accounted for, $\Delta R^2 = .13, F(5, 97) = 3.92, p = .003$. At Step 3, there were three significant interactions: Somatic Symptoms x Group ($b = 0.45, SE = .18,$

$t(102) = 2.53, p = .01$); Difficulties in Emotion Regulation x Group ($b = -0.66, SE = .24, t(102) = -2.77, p = .007$); and Difficulties in Emotional Awareness x Group ($b = 0.65, SE = .17, t(97) = 3.93, p < .001$). The interactions between group and interoceptive awareness, and between group and positive affect were not significant (see Table 4).

Using Process simple slopes analyses (Hayes, 2013) to probe the interaction effects revealed that for PNES participants, greater difficulties in emotional awareness corresponded with *higher* frequency of physical affection, $b = 0.32, SE = 0.13, t(109) = 2.51, p = .013$. For the trauma-exposed controls (hi- and lo-psychopathology combined), difficulties in emotional awareness and physical affection were unrelated, $b = -0.14, SE = .08, t(109) = -1.68, p = .096$, although a non-significant trend indicated that the relationship was in the negative direction, with more emotional awareness difficulties relating to less affectionate touch frequency. When probing the interaction between somatic symptoms and group membership using Process, it was not significant, $b = 0.05, SE = .15, t(110) = 0.30, p = .76$, nor was the interaction between difficulties in emotion regulation and group, $b = -0.09, SE = .18, t(109) = -0.48, p = .63$.

Discussion

The present study examined whether individuals with psychogenic non-epileptic seizures (PNES) seek and experience less affectionate touch in their partner relationships than trauma controls. As there is a high occurrence of trauma reported among PNES individuals, trauma-exposed individuals with high psychopathology and low psychopathology levels were included as comparison groups. By including these control groups split into lo- and hi-psychopathology, it was possible to learn about how these processes were different and similar to individuals with PNES. It was found that PNES

individuals reported lower interoceptive awareness and less frequency of physical affection than both the hi- and lo-psychopathology groups; and more somatic symptoms, more difficulties in emotion regulation, and less positive affect than the lo- but not than the hi-psychopathology group. The groups did not differ in emotional awareness difficulties, but, surprisingly, for those with PNES (but not for controls), greater difficulties with emotional awareness were associated with more frequent physical affection in a model that also included somatic symptoms, interoceptive awareness, difficulties in emotion regulation, and positive affect.

PNES and Emotion Processing

The Difficulties in Emotion Regulation Scale was used to assess participants' overall self-reported ability in managing/influencing their emotions and responses as well as their ability to be aware of emotions. PNES participants reported more difficulties than the lo-psychopathology group but did not differ from the hi-psychopathology group, aligning with prior literature depicting how high levels of depression and anxiety impact emotion regulation skills (Compare et al., 2014; Coughlin Della Selva, 2006). It was hypothesized that PNES individuals would report more emotional awareness difficulties in comparison to both trauma-exposed groups. This hypothesis was not supported; there was no significant difference between the PNES group, hi-psychopathology group, or the lo-psychopathology group.

Prior research has identified subgroups showing either (a) difficulties in emotion regulation – Cluster 1, or (b) a lack of emotion self-awareness– Cluster 2, in which individuals present emotionally well, but they actually have difficulties in recognizing their own emotions and their distress (Uliaszek et al., 2012). It is a possibility that more

Cluster 1 individuals are present in this sample, although given our sample size we did not differentiate between Cluster 1 and Cluster 2.

PNES, Somatic Symptoms, and Interoception

It was predicted that PNES individuals would report higher levels of somatic symptoms. As the PNES group reported higher somatic symptoms than the lo-psychopathology group, but not the hi-psychopathology group, this prediction was partially supported. Prior research showed that in comparison to trauma controls with relatively higher and lower levels of posttraumatic stress (PTS high and PTS low), PNES patients did not differ from the PTS high group on emotion regulation or clinical symptoms (e.g., depression and anxiety), but did report more somatic symptoms (Roberts et al., 2012). In this current sample, not all PNES individuals indicated being exposed to a traumatic event and did not reach the PTSD diagnosis threshold, whereas the hi-psychopathology group all had prior trauma exposure, which may have contributed to elevated somatic symptom reporting in the hi-psychopathology group and greater similarity with the PNES group.

It was also hypothesized that the PNES group would report lower interoceptive awareness than both the hi- and lo-psychopathology groups and this hypothesis was supported. PNES individuals reported lower interoceptive awareness than both trauma-exposed groups and there was no difference in interoceptive awareness among the control groups. Interoceptive awareness is one variable where individuals with PNES differ from the hi-psychopathology matched group, indicating that PNES individuals specifically have interoceptive-related deficits that are not accounted for by psychiatric distress/psychopathology.

PNES, Positive Affect, and Touch

It was also hypothesized that PNES individuals would report less positive affect and lower frequency of physical affection. Additionally, it was predicted that they would be less likely to initiate affectionate touch in their relationships in comparison to the psychopathology high and low groups. The PNES group did report lower positive affect than the lo-psychopathology group and lower frequency of physical affection than both lo- and hi-psychopathology groups. The hi- and lo-psychopathology groups did not differ from one another on frequency of physical affection. Also, there were no differences between the groups on touch initiation. It is interesting to note that although there were no differences in relationship quality among all three groups, PNES individuals reported significantly lower frequency of physical affection. These findings suggest that one area individuals with PNES and high psychopathology individuals differ is in the amount of physical affection experienced.

Somatic Symptoms, Interoception, and Affectionate Touch

Across groups, interoceptive awareness was positively correlated with physical affection. A model tested whether higher somatic symptoms, lower interoceptive awareness, more difficulties in emotion regulation, more difficulties in emotional awareness, and lower positive affect predict lower frequency of physical affection. There was a group effect, whereby individuals with PNES reported lower affection frequency (consistent with the analysis of variance results), and there were significant interactions of Somatic Symptoms and Group, Difficulties in Emotion Regulation and Group as well as Difficulties in Emotional Awareness and Group. Simple slopes analyses revealed that the former two interactions were not significant. As for the Difficulties in Emotional

Awareness and Group interaction, for the PNES group, higher difficulties in emotional awareness corresponded with *higher* frequency of physical affection. For the combined hi- and lo-psychopathology trauma-exposed controls, difficulties in emotional awareness and physical affection frequency were unrelated.

Brown and Reuber (2016), discuss how potential disruptions in interoceptive processing may lead PNES patients to misinterpret or increase their attention to bodily signals, which perhaps manifests in more somatic symptoms. However, there was no significant correlation in this sample between interoceptive awareness and somatic symptoms. In the model testing whether lower physical affection frequency is predicted by higher levels of somatic symptoms, lower interoceptive awareness, more difficulties in emotion regulation and emotional awareness, and lower positive affect, for the PNES group, while only marginally significant, lower interoceptive processing was associated with lower physical affection. This finding indicates that having difficulties in understanding and feeling what is going inside one's own body may impact one's experience of affectionate touch. Evidence shows PNES individuals tend to avoid sensations including touch (Ranford et al., 2020). If one has difficulty understanding and being aware of their own body, then sensations such as affectionate touch may not necessarily be perceived as pleasant and are thus minimized or avoided. Frequency of affectionate touch and interoceptive awareness were the two domains where PNES individuals differed from the matched hi-psychopathology group and the lo-psychopathology group. This evidence suggest that it may be possible to isolate the effects of interoceptive awareness and affectionate touch on PNES individuals

specifically from individuals who have been exposed to trauma and exhibit similar psychopathology.

Continuing with the model, difficulties in emotional awareness predicted higher frequency of physical affection among PNES individuals in contrast to the anticipated pattern of emotional awareness difficulties corresponding with less affectionate touch (as was found among the trauma-exposed controls). This finding is perhaps suggesting that affectionate touch is used as an attempt by PNES individuals to understand their own feelings, or to compensate for, or even mask, a lack of understanding. The PNES group in this sample may be aware that they have difficulty being attentive to their own feelings and emotions and thus may reach out to their partners more. PNES partners' perspectives and insights on touch initiation, frequency, and other aspects of the relationship were not examined here. There is a possibility that affectionate touch is being initiated by the PNES partners in attempt to bring comfort and support to the PNES individual through their difficulties.

Limitations

There are several limitations that should be addressed. The data collected and utilized in this study were cross-sectional and all relationships among variables examined in this study are correlational. In order to establish causality, longitudinal data would need to be collected. Also, the PNES sample does not have a video-EEG confirmed PNES diagnosis through an epilepsy monitoring unit or through confirmation from a neurologist. Individuals who did report having an EEG and indicated that results revealed epilepsy were excluded, but it is a possibility that individuals in the PNES sample do not in fact have PNES. There is also the possibility of having comorbid epilepsy and PNES in

this sample. Additionally, not all PNES individuals were exposed to traumatic events while all participants in the control groups were trauma-exposed.

Not all PNES individuals were in a partner relationship while the control group participants were all in relationships; there also were more females in the PNES and hi-
psychopathology groups than the lo-psychopathology group. As a result, groups may have different experiences with respect to touch frequency and initiation. In asking about frequency of physical affection, participants were instructed to think about their current or most recent partner, which could have resulted in lower frequencies being reported as participants not currently in a relationship attempt to retrospectively answer about their past relationships. Furthermore, in asking about touch initiation and affectionate touch frequency, it is unclear whether PNES individuals perceive the lower affectionate touch as a detriment to their relationship. It could very well be that PNES individuals are comfortable with the level of touch in their relationships. Or, it could be that PNES individuals are disengaging from touch with their partners due to understanding affectionate touch differently, or that partners are not engaging in touch with PNES individuals. Including partner perspectives about affectionate touch frequency and initiation as well as incidence of conflicts and types of conflicts in the relationship may reveal more as to why PNES individuals are engaging in less physical affection.

As for group comparisons, running multiple ANOVAs, as was done in this study, increases the chance of Type I error. In attempts to reduce this, the Bonferroni post-hoc correction was utilized. In performing the linear regression with multiple independent variables, statistical power was reduced due to listwise deletion of missing data. It should also be noted that the Cronbach's alpha for the lo-psychopathology group's reporting of

somatic symptoms is practically non-existent, indicating the somatic symptoms subscale is not reliable for the lo-psychopathology group.

Implications

Support is an important aspect of conveying understanding to another individual, yet few if any studies have considered partner relationships of individuals with PNES. This study lays a foundation that will help to answer how direct partner involvement can possibly aid an individual with PNES and their symptoms as well as how the supportive behavior of others can impact a PNES individual's emotional states. This study also contributes to the existing literature about how individuals with PNES process emotions, the role of interoceptive awareness, and how affectionate touch behaviors may be affected.

Overall, the results indicate that even when comparing to a group of individuals with similar levels of psychopathology, relationship satisfaction, positive affect, and emotion regulation difficulties, there is still a marked difference in the frequency of physical affection experienced among individuals with PNES. Further research exploring how PNES individuals perceive affectionate touch, and its connection to emotion regulation, emotional awareness, and interoceptive awareness can contribute to knowledge about PNES pathophysiology and their social relationships.

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APPENDIX A
TABLES

Table 1.
Sample Characteristics

Characteristic	PNES (<i>n</i> = 62)		Psychopathology – High Control Group (<i>n</i> = 40)		Psychopathology – Low Control Group (<i>n</i> = 40)		<i>F</i>	<i>df</i>	<i>p</i>	η^2
	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)				
Age	55	36.07 (14.30)	37	33.41 (8.43)	40	32.77 (7.74)	1.18	2	.31	.02
Education	57	15.54 (2.30)	40	14.86 (1.37)	38	14.79 (2.27)	2.01	2	.14	.03
Locke-Wallace	28	114.75 (35.36)	35	105.43 (29.02)	40	118.73 (26.24)	1.91	2	.15	.04
Posttraumatic Stress Disorder Checklist (PCL- 5)	42	36.76 (19.48) _a	40	40.17 (17.81) _a	40	15.45 (14.19) _b	23.99	2	<.001	.29
SCL-53 Global Severity Index	45	1.53 (.90) _a	40	1.59 (.70) _a	40	.32 (.21) _b	44.92	2	<.001	.42
SCL-53 Symptom Subscales										
Anxiety	45	1.65 (1.24) _a	40	1.87 (.91) _a	40	.28 (.27) _b	35.55	2	<.001	.37
Depression	45	1.59 (1.00) _a	40	1.52 (.80) _a	40	.22 (.29) _b	41.08	2	<.001	.40
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	χ^2	<i>df</i>	<i>p</i>	
Sex							12.49	2	.002	
Female	52	83.9%	34	85%	23	57.5%				
Male	9	14.5%	6	15%	17	42.5%				
Transgender	1	1.6%								
Ethnicity							26.35	10	.003	
White	48	78.7%	22	55%	19	47.5%				
Black/African/ Caribbean	4	6.6%	2	5%	5	12.5%				
Hispanic/ Latino	4	6.6%	12	30%	6	15%				
Native American/ Alaska Native	3	4.8%			1	2.5%				
Asian	1	1.6%			1	2.5%				
Mixed	1	1.6%	4	10%	8	20%				
Marital Status							31.76	4	<.001	
In a relationship – Unmarried	15	24.2%	20	50%	14	35%				
Married	25	40.3%	19	47.5%	26	65%				
Single	18	29%	0		0					
Income Level							7.80	4	.10	
Lower/ Lower – middle	30	48.4%	24	60%	12	30%				

Middle	21 33.9%	12 30%	21 52.5%
Upper- middle/ Upper	9 14.5%	4 10%	7 17.5%

Note: Different subscripts (“*a*” and “*b*”) within a row indicate means differ significantly, $p < .05$. PNES = psychogenic nonepileptic seizures. SCL-53 = Symptom Checklist-53

Table 2.
Descriptives for Major Study Variables

Variable	PNES		Psychopathology- High Control Group		Psychopathology- Low Control Group	
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M(SD)</i>
Physical Affection Frequency	36	3.04 (1.02) _a	42	3.55 (.50) _b	43	3.45 (.55) _b
Touch Initiation	33	3.45 (1.60) _a	39	3.31 (1.40) _a	40	3.75 (1.55) _a
SCL-53 Symptom Subscales						
Assessment of Interoceptive Awareness (MAIA)	42	2.81 (1.21) _a	42	3.61 (.99) _b	43	3.47 (1.09) _b
Difficulties in Emotional Awareness	41	2.52 (1.10) _a	42	2.28 (.99) _a	43	2.17 (.95) _a
Difficulties in Emotion Regulation	41	2.51 (.93) _a	42	2.56 (.81) _a	43	1.72 (.48) _b
Positive Affect (PANAS)	45	2.95 (.91) _a	42	3.26 (.76) _a	43	3.68 (.79) _b

Note: Values are group means (*SD*). Different subscripts (“*a*” and “*b*”) within a row indicate means differ significantly, $p < .05$. PNES = psychogenic nonepileptic seizures. SCL-53 = Symptom Checklist-53

Table 3.
Bivariate Correlations of Major Study Variables

	11	10	9	8	7	6	5	4	3	2	1
1. Locke-Wallace Marital Satisfaction	-0.19	-0.27*	-0.09	0.55**	0.30**	0.18	-0.23*	-0.34**	-0.26*	-0.29**	-
2. SCL - Global Severity Index	0.70**	0.74**	0.07	-0.10	-0.36**	-0.03	0.89**	0.94**	0.92**	-	-
3. SCL-Anxiety	0.68**	0.69**	0.004	-0.05	-0.25*	0.06	0.80**	0.86**	-	-	-
4. SCL-Depression	0.70**	0.73**	0.14	-0.12	-0.44**	-0.05	0.82**	-	-	-	-
5. SCL-Somatization	0.57**	0.59**	0.04	-0.08	-0.33**	-0.01	-	-	-	-	-
6. Interoceptive Awareness (MAIA)	-0.07	-0.10	-0.51**	0.36**	0.41**	-	-	-	-	-	-
7. Positive Affect (PANAS)	-0.21*	-0.39**	-0.37**	0.16	-	-	-	-	-	-	-
8. Frequency of Physical Affection	-0.07	-0.11	-0.34	-	-	-	-	-	-	-	-
9. Difficulties in Emotional Awareness	0.12	0.18*	-	-	-	-	-	-	-	-	-
10. Difficulties in Emotion Regulation	0.62**	-	-	-	-	-	-	-	-	-	-
11. PTSD Symptom Checklist	-	-	-	-	-	-	-	-	-	-	-

Note: * $p < .05$, ** $p < .01$;

Bivariate Correlations of Major Study Variables: PNES and High Psychopathology

	11	10	9	8	7	6	5	4	3	2	1
1. Locke-Wallace Marital Satisfaction	-0.43*	-0.28	0.42*	0.71**	0.27**	0.06	-0.24	-0.47*	-0.30*	-0.31**	-
2. SCL - Global Severity Index	0.73**	0.76**	-0.10	-0.06	-0.42*	0.16	0.88**	0.94**	0.90**	-	-0.27
3. SCL-Anxiety	0.69**	0.72**	-0.13	-0.03	-0.30*	0.27	0.78**	0.83**	-	0.83**	-0.13
4. SCL-Depression	0.73**	0.75**	-0.04	-0.06	-0.49**	0.12	0.77**	-	0.70**	0.87**	-0.34*
5. SCL-Somatization	0.50*	0.64**	-0.10	0.05	-0.34*	0.10	-	0.66**	0.65**	0.79**	-0.18
6. Interoceptive Awareness (MAIA)	0.10	0.002	-0.38*	0.28	0.41*	-	0.14	-0.09	-0.04	-0.06	0.21
7. Positive Affect (PANAS)	-0.25	-0.43*	-0.22	0.14	-	0.32*	0.02	-0.13	0.26	0.06	0.36*
8. Frequency of Physical Affection	-0.25	-0.10	0.29	-	0.13	0.30	-0.11	-0.30	-0.12	-0.26	0.44**
9. Difficulties in Emotional Awareness	0.17	0.14	-	-0.40**	-0.42**	-0.49**	0.04	0.28	-0.04	0.14	-0.37*
10. Difficulties in Emotion Regulation	0.79**	-	0.22	-0.30	-0.15	-0.04	0.30	0.57**	0.49**	0.57**	-0.31
11. PTSD Symptom Checklist	-	0.38*	0.02	0.02	0.22	0.09	0.36*	0.48**	0.43**	0.46**	-0.02

Note: * $p < .05$, ** $p < .01$; Correlations among the PNES group are presented above the diagonal.

Correlations among the psychopathology-high group are presented below the diagonal.

Bivariate Correlations of Major Study Variables: PNES and Low Psychopathology

	11	10	9	8	7	6	5	4	3	2	1
1. Locke-Wallace Marital Satisfaction	-0.43*	-0.28	0.42*	0.71**	0.27**	0.06	-0.24	-0.47*	-0.30*	-0.31**	-
2. SCL - Global Severity Index	0.73**	0.76**	-0.10	-0.06	-0.42*	0.16	0.88**	0.94**	0.90**	-	-0.19
3. SCL-Anxiety	0.69**	0.72**	-0.13	-0.03	-0.30*	0.27	0.78**	0.83**	-	0.70**	-0.20
4. SCL-Depression	0.73**	0.75**	-0.04	-0.06	-0.49**	0.12	0.77**	-	0.59**	0.64**	-0.10
5. SCL-Somatization	0.50*	0.64**	-0.10	0.05	-0.34*	0.10	-	0.16	0.26	0.35*	-0.12
6. Interoceptive Awareness (MAIA)	0.10	0.002	-0.38*	0.28	0.41*	-	0.14	0.24	0.12	0.07	0.28
7. Positive Affect (PANAS)	-0.25	-0.43*	-0.22	0.14	-	0.33*	-0.06	-0.30	-0.26	-0.34*	0.26
8. Frequency of Physical Affection	-0.25	-0.10	0.29	-	0.09	0.34*	-0.03	0.27	0.08	0.14	0.63**
9. Difficulties in Emotional Awareness	0.17	0.14	-	-0.13	-0.45**	-0.58**	-0.15	0.09	0.11	0.04	-0.22
10. Difficulties in Emotion Regulation	0.79**	-	0.10	0.15	-0.29	.07	0.08	0.27	0.39*	0.38*	-0.02
11. PTSD Symptom Checklist	-	0.07	0.08	0.09	-0.17	0.27	-0.12	0.26	0.20	0.09	0.15

Note: * $p < .05$, ** $p < .01$; Correlations among the PNES group are presented above the diagonal.

Correlations among the psychopathology-low control group are presented below the diagonal.

Table 4

Hierarchical Regression with Somatic Symptoms, Interoceptive Awareness, Difficulties in Emotional Regulation, Difficulties in Emotional Awareness, and Positive Affect as Predictors of Frequency of Physical Affection (N = 108)

Variable	Step 1				Step 2				Step 3			
	<i>b</i>	<i>SEb</i>	CI	<i>B</i>	<i>b</i>	<i>SEb</i>	CI	<i>B</i>	<i>b</i>	<i>SEb</i>	CI	<i>B</i>
Somatic Symptoms	0.00	.08	-0.17, 0.17	0.001	0.05	.09	-0.11, 0.22	0.07	0.17**	.09	0.001, 0.34	0.22*
Interoceptive Awareness	0.31**	.07	0.16, 0.45	0.44**	0.27*	.07	0.13, 0.42	0.40**	0.25**	.07	0.11, 0.39	0.36**
Difficulties in Emotion Regulation	-0.10	.12	-0.31, 0.12	-0.12	-0.12	.10	-0.33, 0.09	-0.13	-0.30*	.11	-0.51, -0.08	-0.32*
Difficulties in Emotional Awareness	0.16*	.08	0.001, 0.32	0.21*	0.16*	.08	0.01, 0.32	0.21*	0.24*	.08	0.08, 0.40	0.31*
Positive Affect	0.02	.09	-0.16, 0.21	0.03	-0.001	.09	-0.18, 0.18	-0.001	-0.09	.09	-0.27, 0.09	-0.10
Group (PNES vs Controls)					-0.40*	.16	-0.71, -0.08	-0.23	0.97	.55	-0.11, 2.05	0.57
Somatic Symptoms x Group									0.45*	.18	0.10, 0.81	0.27*
Interoceptive Awareness x Group									0.14	.14	-0.15, 0.42	0.09
Difficulties in Emotion Regulation x Group									-0.66*	.24	-1.14, -0.19	-0.95*
Difficulties in Emotional Awareness x Group									0.65**	.17	0.32, 1.00	0.39**
Positive Affect x Group									-0.7	.19	-0.45, 0.31	-0.04
<i>R</i> ²	.18				.47				.35			
ΔR^2					.05*				.13*			

Note: Variables are mean centered. Group coded as 0 = PNES, 1 = Controls; **p* ≤ .05, ***p* ≤ .001

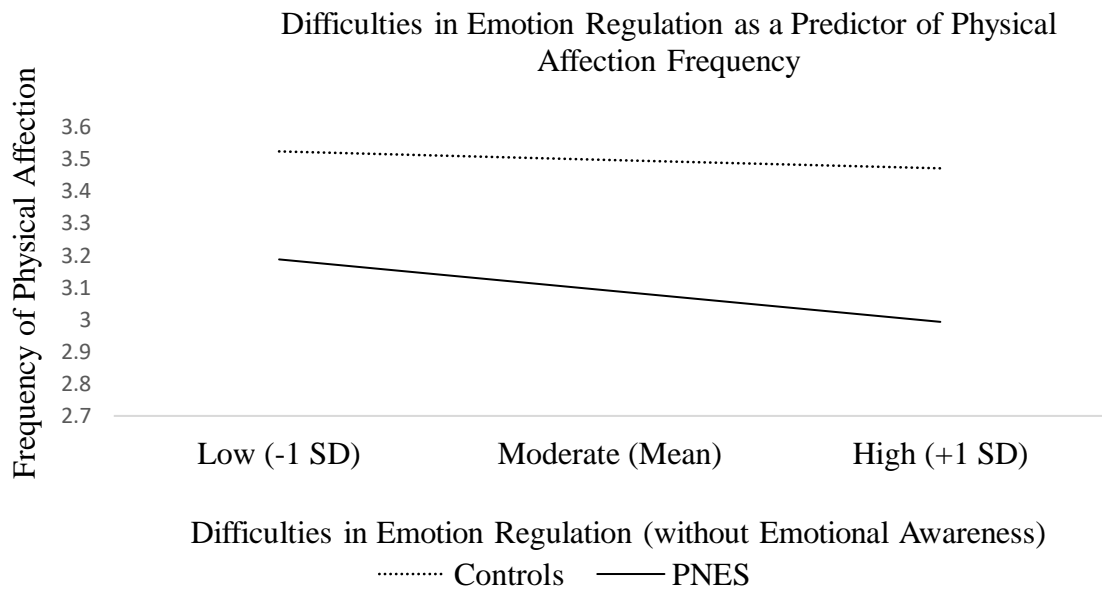
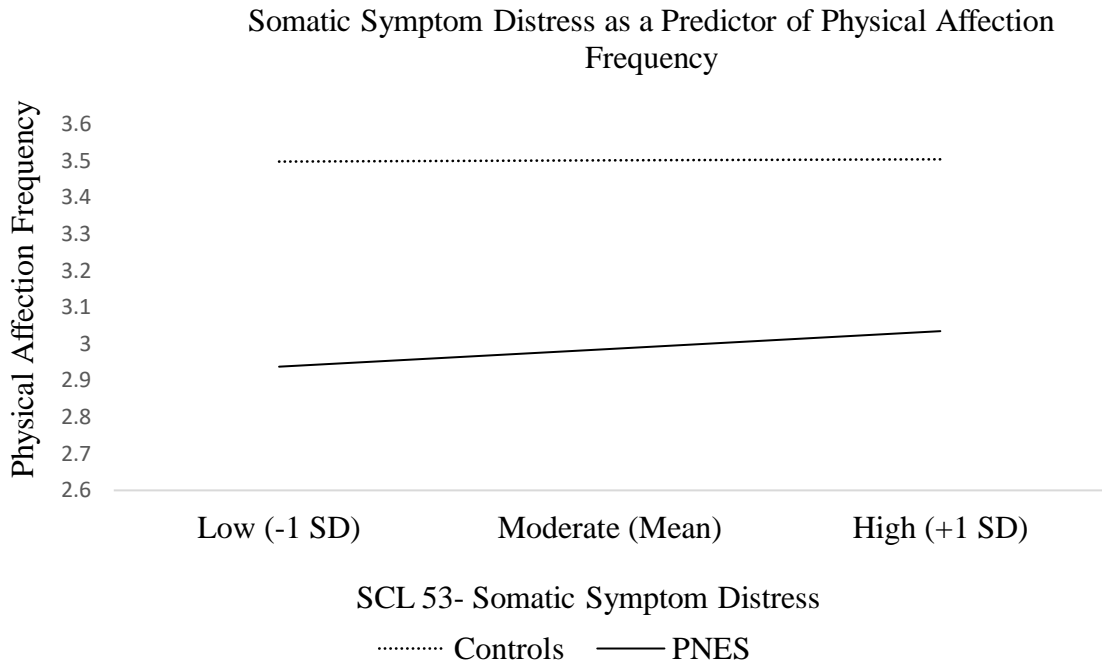
Table 5
Simple Slopes Analyses

Variable	<i>b</i>	SE	<i>t</i>	<i>p</i>	CI LL, UL
Somatic Symptoms	0.02	.07	0.31	.76	-0.12, 0.17
Group	-0.52	.16	-3.23	.002	-.82, -0.20
Somatic Symptoms x Group	0.05	.15	0.30	.76	-0.26, 0.35
Difficulties in Emotion Regulation	-0.07	.09	-0.80	.42	-0.24, 0.10
Group	-0.41	.15	-2.69	.008	-0.71, -0.12
Difficulties in Emotion Regulation x Group	-0.09	.18	-0.48	.63	-0.44, 0.27
Difficulties in Emotional Awareness	0.06	.07	0.84	.41	-0.08, 0.20
Group	-0.46	.15	-3.16	.002	-0.75, -0.17
Difficulties in Emotional Awareness x Group	0.46	.15	3.02	.003	0.16, 0.76
Moderator Levels for Difficulties in Emotional Awareness					
PNES	0.32	.13	2.51	.014	.07, 0.58
Psychopathology High and Low Control Group	-0.14	.08	-1.68	.096	-.30, 0.02

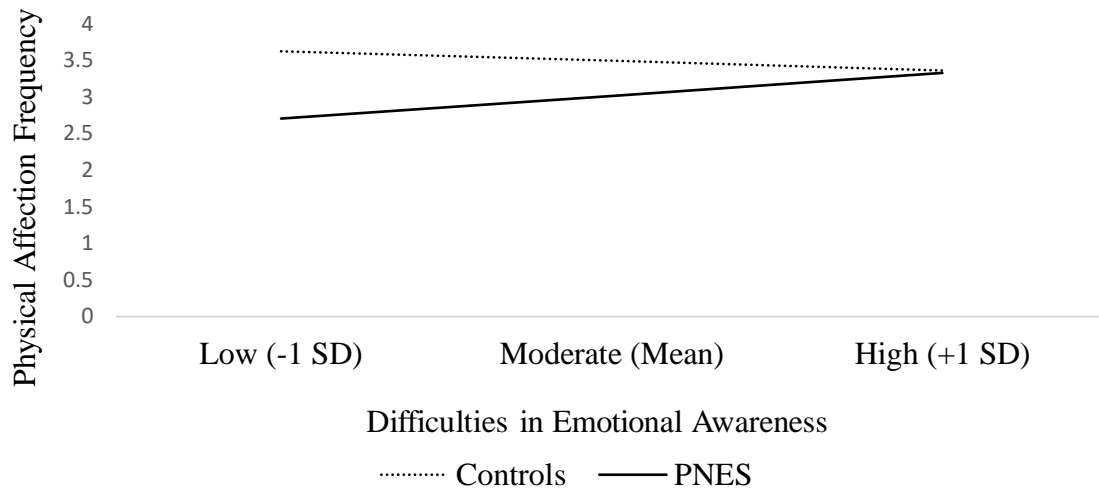
Note: Process (Hayes, 2013) was utilized to probe interactions, each independent variable was examined separately.

APPENDIX B
FIGURES

Figure 1
Simple Slopes Graphs



Difficulties in Emotional Awareness as a Predictor of Physical Affection Frequency



APPENDIX C
MEASURES

45 PTSD CHECKLIST – DSM-5 (PCL-5)

Below is a list of problems and complaints that people sometimes have in response to stressful life experiences.

Please read each one carefully, then choose one of the answers to indicate how much you have been bothered by that problem IN THE LAST MONTH. Again, please do this with respect to the event you have in mind.

Not at All (0) A Little Bit (1) Moderately (2) Quite a Bit (3) Extremely (4)

1. Repeated, disturbing, and unwanted memories of the stressful experience?
2. Repeated, disturbing dreams of the stressful experience?
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?
4. Feeling very upset when something reminded you of the stressful experience?
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?
6. Avoiding memories, thoughts, or feelings related to the stressful experience?
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?
8. Trouble remembering important parts of the stressful experience?
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?
10. Blaming yourself or someone else for the stressful experience or what happened after it?
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?
12. Loss of interest in activities that you used to enjoy?
13. Feeling distant or cut off from other people?
14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?
15. Irritable behavior, angry outbursts, or acting aggressively?
16. Taking too many risks or doing things that could cause you harm?
17. Being “superalert” or watchful or on guard?
18. Feeling jumpy or easily startled?
19. Having difficulty concentrating?
20. Trouble falling or staying asleep?

DIFFICULTIES IN EMOTION REGULATION SCALE (DERS-18)

Please indicate how often the following statements apply to you by marking the appropriate answer:

1	2	3	4	5
Almost Never (0 – 10 %)	Sometimes (11 – 35%)	About Half the Time (36 – 65%)	Most of the Time (66 – 90%)	Almost Always (91 – 100%)

1. I pay attention to how I feel.
2. I have no idea how I am feeling.
3. I have difficulty making sense out of my feelings.
4. I am attentive to my feelings.
5. I am confused about how I feel.
6. When I'm upset, I acknowledge my emotions.
7. When I'm upset, I become embarrassed for feeling that way.
8. When I'm upset, I have difficulty getting work done.
9. When I'm upset, I become out of control.
10. When I'm upset, I believe that I will remain that way for a long time.
11. When I'm upset, I believe that I'll end up feeling very depressed.
12. When I'm upset, I have difficulty focusing on other things.
13. When I'm upset, I feel ashamed with myself for feeling that way.
14. When I'm upset, I feel guilty for feeling that way.
15. When I'm upset, I have difficulty concentrating.
16. When I'm upset, I have difficulty controlling my behaviors.
17. When I'm upset, I believe that wallowing in it is all I can do.
18. When I'm upset, I lose control over my behaviors.

SYMPTOM CHECKLIST 53 (SCL-53)

Below is a list of problems and complaints that people sometimes have. Please read each one carefully. After you have done so, please rate HOW MUCH DISCOMFORT THAT PROBLEM HAS CAUSED YOU DURING THE PAST WEEK INCLUDING TODAY.

HOW MUCH WERE YOU DISTRESSED BY:

Not at All (0)	A Little Bit	Moderately	Quite a Bit (3)	Extremely
	(1)	(3)		(4)

1. Nervousness or shakiness inside
2. Faintness or dizziness
3. The idea that someone else can control your thoughts
4. Feeling others are to blame for most of your troubles
5. Trouble remembering things
6. Feeling easily annoyed or irritated
7. Pains in heart or chest
8. Feeling afraid in open spaces or on the streets
9. Thoughts of ending your life
10. Feeling that most people cannot be trusted
11. Poor appetite
12. Suddenly scared for no reason
13. Temper outbursts that you could not control
14. Feeling blocked in getting things done
15. Feeling lonely
16. Feeling blue
17. Feeling no interest in things
18. Feeling fearful
19. Your feelings being easily hurt
20. Feeling that people are unfriendly or dislike you
21. Nausea or upset stomach
22. Feeling inferior to others
23. Feeling that you are watched or talked about by others
24. Trouble falling asleep
25. Having to check and double-check what you do
26. Difficulty making decisions
27. Feeling afraid to travel on buses, subways, or trains
28. Trouble getting your breath
29. Hot or cold spells
30. Having to avoid certain things, places, or activities because they frighten you
31. Your mind going blank
32. Numbness or tingling in parts of your body
33. Feeling hopeless about the future
34. Trouble concentrating

35. Feeling weak in parts of your body
36. Feeling tense or keyed up
37. Thoughts of death or dying
38. Having urges to beat, injure, or harm someone
39. Having urges to break or smash things
40. Feeling very self-conscious with others
41. Feeling uneasy in crowds, such as shopping or at a movie
42. Spells of terror or panic
43. Getting into frequent arguments
44. Feeling nervous when you are left alone
45. Others not giving you proper credit for all your achievements
46. Feeling lonely even when you are with people
47. Feeling so restless you couldn't sit still
48. Feelings of worthlessness
49. Feeling that people will take advantage of you if you let them
50. The idea that you should be punished for your sins
51. Never feeling close to another person
52. Feelings of guilt
53. The idea that something is wrong with your mind

MULTIDIMENSIONAL ASSESSMENT OF INTEROCEPTIVE AWARENESS
(MAIA)

Below you will find a list of statements. Please indicate how often each statement applies to you generally in daily life:

Never				Always
1	2	3	4	5

1. I notice how my body changes when I am angry.
2. When something is wrong in my life I can feel it in my body.
3. I notice that my body feels different after a peaceful experience.
4. I notice that my breathing becomes free and easy when I feel comfortable.
5. I notice how my body changes when I feel happy/joyful.
6. I listen for information from my body about my emotional state.
7. When I am upset, I take time to explore how my body feels.
8. I listen to my body to inform me about what to do.

LOCKE WALLACE MARITAL/RELATIONSHIP ADJUSTMENT TEST (LW)

Please rate on the scale below which best describes how happy your current relationship/marriage is. The middle point ("happy") represents the degree of happiness you believe that most people get from romantic relationships.

Current level of happiness with your marriage/relationship:

1	2	3	4	5	6
Very Unhappy		Happy			Perfectly Happy

State the approximate extent of agreement or disagreement between you and your spouse/partner on the following items by checking a response for each item:

Always Disagree (0)	Almost Always Disagree (1)	Frequently Disagree (2)	Occasionally Disagree (3)	Almost Always Agree (4)	Always Agree (5)
---------------------------	-------------------------------------	-------------------------------	---------------------------------	-------------------------------	------------------------

1. Handling family finances
2. Matters of recreation
3. Demonstrations of affection
4. Friends
5. Sex relations
6. Conventionality (right, good, or proper conduct)
7. Philosophy of life
8. Ways of dealing with in-laws

When disagreements arise, they usually result in:

- My giving in
- My spouse/partner giving in
- Agreement by mutual give and take

Do you and your spouse/partner engage in outside interests together?

- All of them

- Some of them
- Very few of them
- None of them

Do you ever wish you had not married (or that you were not with your current partner)?

- Frequently
- Occasionally
- Rarely
- Never

In leisure time, do you generally prefer:

- To be “on the go”
- To stay at home

If you had your life to live over again, do you think you would:

- Marry the same person / be in a relationship with the same person
- Marry a different person / be in a relationship with a different person
- Not marry at all / not be in a relationship at all

Do you confide in your spouse/partner:

- Almost never
- Rarely
- In most things
- In everything

POSITIVE AND NEGATIVE AFFECT SCHEDULE (PANAS)

This scale consists of a number of words that describe different feelings and emotions.

Read each item and check the appropriate answer next to the word. Indicate to what extent you GENERALLY feel this way:

Very Slightly or Not at All (1)	A Little (2)	Moderately (3)	Quite a Bit (4)	Extremely (5)
---------------------------------------	-----------------	-------------------	--------------------	------------------

1. Interested
2. Distressed
3. Excited
4. Upset
5. Strong
6. Guilty
7. Scared
8. Hostile
9. Enthusiastic
10. Proud
11. Irritable
12. Alert
13. Ashamed
14. Inspired
15. Nervous
16. Determined
17. Attentive
18. Jittery
19. Active
20. Afraid

PHYSICAL AFFECTION SCALE (PAS)

Please indicate how often you engage in each of the following behaviors with your partner OR how often you engaged in the following behaviors with your most recent partner. Indicate the appropriate number, or "N/A" if not applicable:

Never (0)	Less than Once a Month (1)	1-3 Times a Month (2)	1-3 Times a Week (3)	Almost Daily (4)	N/A
--------------	-------------------------------------	-----------------------------	----------------------------	------------------------	-----

1. Hugging each other
2. Touching or patting each other anywhere on the body
3. Holding hands or having arms around one another's shoulders
4. Adjusting each other's clothes, hair, or appearance
5. Cuddling with each other on a couch or bed
6. Giving each other neck or back massages or similar warm touches
7. Kissing
8. Having sexual contact with each other

TOUCH INITIATION QUESTIONNAIRE

Please indicate how much you agree or disagree with each of the following statements:

Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Slightly Agree (4)	Moderately Agree (5)	Strongly Agree (6)
-----------------------------	-------------------------------	-----------------------------	--------------------------	----------------------------	--------------------------

1. In my current relationship, I am the one to initiate touch.
2. In my current relationship, my partner is the one to initiate touch.
3. In my current relationship, my partner and I equally initiate touch.