

CONFIRMING THE DISSOCIATIVE SUBTYPE OF POSTTRAUMATIC STRESS  
DISORDER IN A SAMPLE OF TRAUMATIZED JUSTICE-INVOLVED YOUTH

by

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## ABSTRACT

Recent neurobiological, epidemiological, and psychological research has provided evidence for a dissociative subtype of Posttraumatic Stress Disorder (PTSD). However, much of the current evidence base has only included samples of adults with acute trauma exposure, and the literature has not yet determined if there are systematic differences between individuals who do and do not meet criteria for the dissociative subtype. Therefore, additional research is needed to determine whether the dissociative subtype is valid in youth with chronic trauma exposure and what factors affect the likelihood of dissociative subtype membership in youth. Using a sample of 248 adolescents (90 girls, 158 boys) between the ages of 13 to 19, this study sought to confirm the dissociative subtype of PTSD in a sample of traumatized adolescents and to investigate whether peritraumatic dissociation, emotion dysregulation, gender, and betrayal trauma exposure affected the likelihood of dissociative subtype membership. Results indicated that approximately half of participants (50.8%) met criteria for the dissociative subtype. Furthermore, results of logistic regression indicated that adolescents with greater levels of peritraumatic dissociation and emotion dysregulation were at an increased risk of subtype membership. This study has important implications concerning those adolescents who may be particularly likely to receive the dissociative subtype label.

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## INTRODUCTION

Although there is a lack of conceptual clarity regarding the definition of dissociation (van der Hart & Dorahy, 2009), the field of traumatic stress studies has more or less converged on the notion that dissociation is defined by a lack of normal integration of aspects of information processing, such as thoughts, feelings, and experiences (DePrince & Freyd, 2014; Freyd, 1996). Many hold the view that dissociative experiences occur on a spectrum (van der Hart & Dorahy, 2009) ranging from normative dissociative phenomena, such as absorption in everyday experiences, fantasy, and daydreaming (Butler, 2006), to pathological dissociation, which can include a multitude of symptoms, including time distortion, depersonalization, fragmentation of self, derealization, and amnesia (Lanius et al., 2014). The DSM-5 limits its definition of dissociation to only two of these phenomena: depersonalization, or “persistent or recurrent experiences of feeling detached from, and as if one were an outside observer of, one’s mental processes or body,” and derealization, which the manual defines as “persistent or recurrent experiences of unreality of surroundings” (American Psychiatric Association, 2013, p. 274).

Theorists and scientists have long hypothesized a link between trauma exposure, Posttraumatic Stress Disorder (PTSD), and dissociation. Since Pierre Janet’s hallmark publication in the late 19th century, many theorists have considered trauma exposure to be a precursor to future pathological dissociative symptoms. Numerous empirical studies

have supported these links among trauma exposure, PTSD, and dissociation. For example, previous research has demonstrated that both adults (Briere, 2006) and children (Ford, 2013) with a history of trauma report higher levels of dissociation than do nontraumatized groups. Additionally, a recent review of the current literature reports that across a wide range of studies, dissociation is consistently and strongly related to the presence and severity of PTSD symptoms and is moderately associated with trauma exposure and severity of the trauma (Armour, Karstoft, & Richardson, 2014; Carlson, Dalenberg, & McCade-Montez, 2012). It is of clinical importance to distinguish which individuals with PTSD also experience dissociation, given that research has demonstrated that individuals with dissociative symptoms may require more treatment sessions before improving and may respond differently to evidence-based PTSD treatments (Lanius, Brand, Vermetten, Frewen, & Spiegel, 2012; Lanius et al., 2014).

Recently, a small subset of the literature has focused on validating a dissociative subtype of PTSD, which undoubtedly influenced the addition of a new dissociative subtype in the most recent revision of the DSM. According to the DSM-5, in order to meet criteria for the dissociative subtype, an individual must meet full diagnostic criteria for PTSD and endorse one symptom of depersonalization or derealization. Although some argue that this definition of dissociation is too narrow (Armour, Contractor, Palmieri, & Elhai, 2014), Lanius and colleagues (2014) explain that the DSM-5 principally focuses on these two symptoms of dissociation, rather than other dissociative symptoms such as amnesia or flashbacks, because they present in only a small subset of individuals, thus making a “subtype” easier to distinguish.

A number of psychological and epidemiological studies have provided evidence

for the existence of a dissociative subtype of PTSD. In one of the first investigations of a possible dissociative subtype, Waelde, Silvern, and Fairbank (2005) employed a taxometric approach in their study of 316 male Vietnam veterans. They found that, among the 76 participants who met DSM-IV criteria for current PTSD, 32% could be classified into a dissociative taxon. Additionally, an international study of 25,018 adults found that 14% of the 475 participants who met DSM-IV criteria for PTSD could be classified into a dissociative subtype based on the presence of one derealization symptoms and/or two symptoms of depersonalization (Stein et al., 2013).

Other studies have utilized latent profile analysis to provide evidence for a dissociative subtype. For example, Wolf and colleagues (2012) investigated the dissociative subtype in a sample of 492 veterans and their intimate partners, 206 of whom met DSM-IV criteria for current PTSD. Their analysis demonstrated that 12% of those participants who met criteria for PTSD could be categorized in to a dissociative subtype, which the study defined as exhibiting high levels of PTSD symptoms and elevated scores on items assessing derealization, depersonalization, and flashbacks. Additionally, Steuwe, Lanius, and Frewen (2012) found that 26% of the 134 adults in their sample could be categorized into a dissociative subtype, which was also defined solely by symptoms of depersonalization or derealization. In another study of veterans with PTSD (284 females, 360 males), Wolf and colleagues (2012b) demonstrated that 15% of male participants and 30% of female participants could be categorized into a dissociative subgroup; in this study, dissociative subtype membership was again defined by depersonalization and derealization symptoms. Most recently, Armour and colleagues (2014) found that 14% of their sample of 432 veterans with PTSD could be considered



members of a dissociative subtype, which these authors operationalized as endorsement of depersonalization, derealization, and reduction in awareness.

Neurobiological investigations of adults also have provided evidence for a dissociative subtype. Using script-driven imagery and fMRI, a number of studies have demonstrated differences in the patterns of brain activation of individuals who experience dissociation in comparison to those who do not (see Lanius et al., 2010 for a review). These differences are primarily seen in the activation of the medial prefrontal regions, such that individuals who experience dissociation show emotional overmodulation, or high activation in medial prefrontal cortex and anterior cingulate cortex (Brand, Lanius, Vermetten, & Loewenstein, 2012). In contrast, individuals who show primarily symptoms of re-experiencing and hyperarousal demonstrate emotional undermodulation through low activation in the medial prefrontal cortex and the anterior cingulate cortex (Lanius et al., 2010). Taken together, the current literature provides sound evidence that a subset of adults with PTSD experience dissociation, though there are still a number of limitations of the current evidence base.

Despite the evidence supporting the existence of a dissociative subtype, there are still a number of questions that remain unanswered. First, because all of the studies to date that support the existence of a dissociative subtype have been based upon samples of adults, the question remains as to whether or not this subtype can be applied to children and adolescents. This is important to consider, given that previous research has suggested that a number of dissociative experiences, such as daydreaming, imaginative involvement, and absorption, are developmentally normative and thus dissociation may have fewer pathological implications for young people (Carlson, Yates, & Sroufe, 2009).

Another limitation to the current empirical evidence is that the majority of investigations of the dissociative subtype have primarily utilized samples of individuals with a history of single-event, acute stressors, termed Type I (Terr, 1991) trauma, rather than samples of individuals with a history of prolonged and repeated interpersonal trauma (Type II; Terr, 1991). Among the studies investigating the possibility of a dissociative subtype, Steuwe and colleagues' (2012) is the only one to date that has included participants who may have had a history of Type II traumas, such as a history of child abuse. However, the authors did not report what kinds of child abuse or how many traumatic events the participants in their study experienced. Thus, the current literature does not allow for a firm conclusion to be drawn as to whether or not the dissociative subtype holds among samples of individuals who have experienced chronic interpersonal traumatization.

Another limitation of the current evidence base concerns the fact that there is not a clear understanding of whether there are systematic differences in the kinds of traumatic experiences that are associated with membership in the dissociative group. One consistent finding across studies is that members of the dissociative group disproportionately report previous sexual or physical abuse (Steuwe et al., 2012; Wolf et al., 2012b), especially during childhood, and exhibit higher levels of PTSD and comorbid psychopathology than those in the nondissociative group (Blevins, Weathers, & Witte, 2014; Lanius et al., 2014). However, other investigations have found conflicting results. For example, Armour, Karstoft, and Richardson (2014) did not find any differences in the type of traumatic experiences or levels of psychopathology when comparing the dissociative group and nondissociative group in their study of college students who met criteria for PTSD. Additionally, there are conflicting results thus far regarding whether or

not individuals of either gender are more likely to be members of the dissociative subtype. For example, Armour, Karstoft, & Richardson (2014) found no gender differences between the nondissociative and dissociative groups in their study of college students, while another study found that adult males were more likely than females to be members of the dissociative subtype (Stein et al., 2013). Furthermore, the research to date regarding dissociation amongst adolescents suggests that girls are more likely than boys to evidence the posttraumatic symptom of dissociation (Zona & Milan, 2011). Thus, although previous studies have reported some differences between dissociative and nondissociative groups, much of the evidence conflicts, and therefore future research must continue to investigate specific factors, including type of trauma exposure, and gender, that might predict dissociative subtype membership.

One factor that likely affects membership in the dissociative subtype is peritraumatic dissociation, which refers to dissociative experiences that occur during the traumatic event or shortly thereafter (Marmar et al., 1994; Spiegel & Cardena, 1991). Research has demonstrated that peritraumatic dissociation predicts later PTSD symptoms in samples of adults (e.g., Breh & Seidler, 2007), children (e.g., Bui et al., 2011; Schafer, Barkmann, Riedesser, & Schulte-Markwort, 2004; Sugar & Ford, 2012), and adolescents (Kerig & Bennett, 2013). Additionally, a meta-analysis concluded that peritraumatic dissociation may be the largest known risk factor for the development of PTSD (Ozar, Best, Lipsey, & Weiss, 2003). However, the association between peritraumatic dissociation and dissociative subtype membership is still unclear. Whereas some posit that peritraumatic and persistent dissociation likely manifest from the same underlying mechanism (Briere, Scott, & Weathers, 2005), the association between peritraumatic and

persistent dissociation has not been the focus of many empirical studies. Thus far, only one study has investigated the association between peritraumatic dissociation and persistent dissociation, and only a weak association was found between the two variables (Tichenor, Marmar, Weiss, Metzler, & Ronfeldt, 1996). Therefore, although it seems plausible that an association exists between peritraumatic dissociation and dissociative subtype membership amongst youth, only one study to date has investigated this possibility. Using a sample of 225 traumatized delinquent adolescents with PTSD, Bennett and colleagues (2015) investigated the association between peritraumatic dissociation and dissociative subtype membership and found that peritraumatic dissociation mediated the association between previous trauma exposure and membership in the dissociative subgroup. Building on this research, the present study will investigate whether peritraumatic dissociation affects dissociative subtype membership independently, or in combination with other factors.

Yet another construct that may increase the likelihood of dissociative subtype membership is emotion dysregulation. Cole and colleagues (1996) suggest that emotion dysregulation plays a crucial role in the development of dissociation and that dissociation might serve as a coping mechanism when an abusive or traumatic situation places excessive demands on a child's emotion regulation capacities. Others posit that emotion dysregulation, specifically an extreme overregulation of affect, may comprise the underlying mechanism by which dissociation operates (Frewen & Lanius, 2006; Lanius et al., 2014). Children who dissociate as a way to cope with their emotions during a traumatic event may eventually come to rely on dissociation as a primary way to self-regulate (Cole et al., 1996; van der Kolk, 2005), which may become maladaptive and

pathological (Ford, 2013; Putnam, 1997).

Empirical research has provided evidence for an association between emotion dysregulation and dissociation. For example, in a study of 618 adults, Briere (2006) found that higher levels of emotion dysregulation were associated with elevated dissociative symptoms. Additionally, Modrowski and Kerig (2014) demonstrated that emotion dysregulation accounted for additional variance in dissociation over and above posttraumatic stress symptoms in their investigation of 611 traumatized adolescents. More recently, Powers and colleagues (2015) investigated the associations among PTSD, emotion dysregulation, and dissociation in a sample of 154 adults and found that the link between PTSD and dissociation was mediated by emotion dysregulation. Given that recent research has suggested that emotion dysregulation plays an important role in the development of dissociation, this study will investigate the independent and combined contribution of emotion dysregulation to membership in the dissociative subtype.

Betrayal trauma exposure is another factor that likely influences dissociative subtype membership. Betrayal trauma theory suggests that individuals who experience trauma in the context of a close relationship are motivated to reject certain aspects of the experience in order to form and maintain their attachment to the abuser (Freyd, 1996). Betrayal traumas are conceptualized as being particularly harmful due the multidimensional nature of the trauma exposure (van der Kolk, 2005). For instance, a child who is sexually abused by his or her parent not only has to endure the physical ramifications of a sexual trauma, but also the emotional consequences of being abused by someone whom he or she depends on for survival. Furthermore, this child may be isolated or shamed into keeping quiet about the abuse, yet is often required to still trust

and love this parent so as to not risk further abuse and/or less care (Freyd, 1996). Freyd (1996) purports that children might actually *need* to dissociate when faced with betrayal trauma and that dissociation is an understandable and adaptive response to an unreasonable situation.

Empirical studies have supported this hypothesized association between betrayal trauma and dissociation. For example, a longitudinal study investigating developmental outcomes following sexual abuse demonstrated that girls who experienced sexual abuse perpetrated by their biological fathers experienced the worst patterns of maladjustment across the next two decades of life, including both PTSD and dissociative symptoms (Trickett, Noll, & Putnam, 2011). Additionally, in a 2003 study of detained youth, Plattner and colleagues (2003) found that intrafamilial abuse, rather than abuse experienced outside of the family context, was associated with dissociative symptoms. Other studies have demonstrated that adults (Swannell et al., 2012; Yates, Carlson, & Egeland, 2008) and adolescents (Chaplo, Bennett, Kerig, & Modrowski, 2015) with histories of child maltreatment experienced higher rates of dissociation and non-suicidal self-injury (Swannell et al., 2012; Yates, Carlson, & Egeland, 2008). Considering that previous research has found associations between betrayal trauma exposure and dissociation in adult samples, it is important to investigate whether or not betrayal trauma exposure affects the likelihood of dissociative subtype membership in a sample of youth.

Finally, it is possible that gender may influence one's likelihood of being a member of the dissociative subtype. Specifically, previous research suggests that girls may be at an increased risk of dissociative subtype membership (Zona & Milan, 2011), particularly given that girls experience greater rates of the types of traumas, such as

sexual abuse, that are most often associated with dissociation (Tolin & Foa, 2006), and often exhibit higher rates of PTSD (Olf, Langeland, Draijer, & Gersons, 2007) in comparison to boys. Therefore, this study will investigate whether gender moderates the associations of peritraumatic dissociation and emotion dysregulation with dissociative subtype membership.

### Dissociation in Delinquent Youth

Although studies validating the DSM-5 dissociative subtype thus far have included only adults, a growing body of literature has turned its focus to studying dissociation in youth involved in the juvenile-justice (JJ) system. These youth are important to include in studies of dissociation and the dissociative subtype for a number of reasons. First, it is well established that the overwhelming majority of youth involved in the JJ system have experienced trauma (Abram et al., 2004; Kerig & Becker, 2012, 2015; Wood, Foy, Goguen, Pynoos, & James, 2002) and that betrayal trauma exposure, in particular, is common in these youth (Chaplo et al., 2015; Kerig, Moeddel, & Becker, 2011). Accordingly, rates of PTSD are also significantly higher among detained youth when compared to community samples (Ford, Chapman, Connor, & Cruise, 2012; Wood et al., 2002). Furthermore, research has also demonstrated that the posttraumatic symptom of dissociation, in particular, is common in detained youth. For example, in a study of 64 youth drawn from a detention center, 28% met criteria for a dissociative disorder (Carrion & Steiner, 2000). Thus, investigating dissociation in delinquent youth will address a number of limitations of previous studies because these youth are known to experience high levels of trauma exposure, including Type II traumas (Terr, 1991), and exhibit high levels of posttraumatic stress and dissociative symptoms.

### The Current Study

To summarize, the current study aimed to investigate the new dissociative subtype of PTSD in an adolescent sample. Additionally, the current study aimed to investigate how peritraumatic dissociation and emotion dysregulation affect the likelihood of dissociative subtype membership, and to see if these associations differed by gender and betrayal trauma exposure. Specifically, this investigation tested the following hypotheses: 1) Youth who experience higher levels of peritraumatic dissociation will demonstrate a greater likelihood of being categorized into the dissociative subtype; 2) Youth experiencing greater levels of emotion dysregulation will have an increased likelihood of dissociative subtype membership; 3) Betrayal trauma exposure will moderate the likelihood of dissociative subtype membership such that higher levels of betrayal trauma exposure will strengthen the associations of peritraumatic dissociation and emotion dysregulation with subtype membership; and 4) Gender will moderate the likelihood of dissociative subtype membership such that the effects of peritraumatic dissociation and emotion dysregulation on subtype membership will be stronger for girls than for boys.



## METHOD

### Participants and Procedure

Participants were drawn from a larger sample of 842 adolescents recruited from a juvenile detention center in the western United States. For the present study, only participants who likely met partial or full criteria for PTSD were included; although the dissociative subtype only applies to youth who meet full criteria for PTSD in the current DSM-5, previous research has demonstrated that many youth still experience significant functional impairment despite not meeting full PTSD criteria (Cohen & Scheeringa, 2009), and so we also included youth who likely met partial criteria for PTSD. Two hundred and forty-eight youth (90 girls, 158 boys) aged 13 to 19 ( $M = 16.10$ ,  $SD = 1.23$ ) likely met partial or full criteria for PTSD, though 36 of these youth stated they “did not remember” regarding one or more items on the measure of peritraumatic dissociation. Results of a t-test comparing these 36 youth to the larger sample indicated that they differed systematically by virtue of reporting significantly lower scores of the measure of emotion dysregulation. Therefore, data for these items were treated as missing at random, and scores for the individual missing items were imputed using multiple imputation. The sample was ethnically diverse: 56.5% identified as Caucasian, 25.0% identified as Latino/a, 3.2% identified as African American, 3.6% identified as Pacific Islander/Native Hawaiian, 3.6% identified as Native American, 6.5% of bi- or multiracial, and 1.6% identified as Other. Following University of Utah, Utah Department of Human Services,

and Juvenile Justice Center IRB approvals, research assistants approached parents or legal guardians during the facility's visiting hours to obtain signed informed consent. After obtaining informed consent, youth were invited to provide signed assent. Clinical psychology graduate students or advanced research assistants conducted individual interviews with youth in a private room within the detention center. To eliminate the possible perception of coercion, guardians and youth were not provided any financial incentive for their participation.

### Measures

Trauma exposure and posttraumatic stress symptoms. The UCLA Posttraumatic Stress Disorder Reaction Index—Adolescent Version (PTSD-RI; Steinberg, Brymer, Decker, & Pynoos, 2004) is a widely used screening measure which has demonstrated good convergent validity with other diagnostic measures, high internal consistency, and high test-retest reliability over a period of 7 days. The first set of questions asks youth whether they have experienced each of 13 specific “very scary, violent, or dangerous” events (e.g., physical harm, sexual assault, traumatic loss, witnessing violence, accidents, medical trauma, natural disasters), and the number of events endorsed is summed to create a Total Trauma Exposure Score. The second set of questions asks youth to rate the extent to which they have experienced 17 possible posttraumatic stress symptoms in the past month that reflect DSM-IV criteria for PTSD. Responses to the questions are presented in a Likert scale format ranging from 0 (*none of the time*) to 4 (*most of the time*). These responses were used to determine whether youth met full or partial diagnostic criteria for PTSD, defined as a youth being exposed to a traumatic event (Criterion A) and meeting criteria for two (partial PTSD) or all three (full PTSD)

symptom clusters.

Betrayal versus nonbetrayal trauma. An adapted version of the Brief Betrayal Trauma Survey (Goldberg & Freyd, 2006) was administered. These items were rephrased to be more comprehensible to youth. For the five traumatic events on the PTSD-RI that involve interpersonal traumas (physical, sexual, or emotional abuse; witnessing family or community violence), youth were asked to indicate whether or not those events involved a person whom the youth “cared a lot about.” For example, youth were asked “Were you ever forced to have some form of sexual contact by someone you cared a lot about (such as a parent or a boyfriend/girlfriend)?” “... by someone you didn’t care a lot about?” A continuous Betrayal Trauma Exposure variable was created to indicate how many separate betrayal traumas a youth reported ever experiencing on the PTSD-RI. Cronbach’s alpha in the current sample was .56. Similarly, ratings on items indicative of traumatic events not including betrayal were summed (Total Nonbetrayal Trauma Exposure;  $\alpha = .55$ ). These low reliabilities are not surprising, given the scale is composed of diverse traumatic events that often do not necessarily overlap in occurrence (e.g., being in a car accident, experiencing a natural disaster).

Dissociative subtype membership. Youth were considered to be members of the dissociative subtype if they met partial or full criteria for PTSD and if they reported experiencing depersonalization or derealization in the previous month “much” or “most” of the time. Depersonalization was assessed with the item “I feel like I am seeing myself, or what I am doing, from outside my body (like watching myself in a movie).” Derealization was assessed with 2 items: “I feel like things around me look strange, different, or like I am in a fog” and “I feel like things around me are not real, like I am in

a dream.”

Peritraumatic dissociation. Peritraumatic dissociation was measured using an adapted version of the Peritraumatic Dissociative Experiences Questionnaire—Children (PDEQ-C; Bui et al., 2011). Youth were asked these items in relation to their experiences during the trauma they indicated as the most upsetting based on their answers on the PTSD-RI. The measure included 8 items from the PDEQ-C in which questions are presented in a Likert scale format ranging from 0 (*not at all true*) to 5 (*extremely true*). Youth could also choose “I don’t remember” as a response, and these individual items were treated as data missing at random and imputed using multiple imputation. After the missing items were imputed, all 8 items were summed to produce a Peritraumatic Dissociation Score ( $\alpha = .79$ ).

Emotion dysregulation. The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item self-report questionnaire designed to assess multiple aspects of emotion regulation. Responses to the questions are presented in a Likert scale format ranging from 1 (*almost never*) to 5 (*almost always*). The measure yields a total score as well as scores for six individual scales derived through factor analysis: nonacceptance of emotional responses (nonacceptance), difficulties engaging in goal directed behavior (goals), impulse control difficulties (impulse), lack of emotional awareness (awareness), limited access to emotion regulation strategies (strategies), and lack of emotional clarity (clarity). All items were summed to create a Total Emotion Dysregulation Score. Cronbach’s alpha in the present sample was .90.

## RESULTS

A series of logistic regressions were conducted to determine whether peritraumatic dissociation and emotion dysregulation increased the likelihood of dissociative subtype membership, and if gender and betrayal trauma exposure moderated the likelihood of dissociative subtype membership. Results indicated that 50.8% of youth met criteria for the dissociative subtype. Of those youth who endorsed dissociation, 53.00% endorsed both depersonalization and derealization, while 1.38% endorsed derealization only and 45.62% endorsed depersonalization only. Table 1 presents means and standard deviations as well as intercorrelations among all study variables.

In order to test whether peritraumatic dissociation independently influenced the likelihood of dissociative subtype membership (Model 1), we conducted a logistic regression with age, ethnicity, and nonbetrayal trauma exposure entered as covariates in Step 1, and peritraumatic dissociation entered in Step 2. Results of this logistic regression indicated that the model was significant,  $\chi^2(4) = 36.25, p < .001, -2LL = 307.49$ , Nagelkerke  $R^2 = .18$ , and correctly classified 65.7% of cases. Furthermore, a nonsignificant Hosmer and Lemeshow test indicated a good fit to the data,  $\chi^2(8) = 8.78, p = .36$ . According to the Wald criterion, greater levels of non-betrayal trauma exposure and peritraumatic dissociation significantly increased the odds of dissociative subtype membership.

A second logistic regression was conducted in order to test whether emotion

dysregulation independently affected the likelihood of subtype membership (Model 2). In this model, age, ethnicity, and nonbetrayal trauma exposure were entered as covariates in Step 1, and emotion dysregulation was entered in Step 2. Results of this logistic regression indicated that the model was significant,  $\chi^2(4) = 24.45, p < .001, -2LL = 319.29$ , Nagelkerke  $R^2 = .13$ , and correctly classified 60.5% of cases. According to the Wald criterion, both nonbetrayal trauma exposure and emotion dysregulation significantly predicted subtype membership. However, it should be noted that the Hosmer and Lemeshow test was significant,  $\chi^2(8) = 17.04, p = .03$ , which suggests this model was not a good fit to the data.

A third logistic regression (Model 3) was conducted with both peritraumatic dissociation and emotion dysregulation in the model in order to test whether the combination of these variables affected the likelihood of subtype membership. Age, ethnicity, and nonbetrayal trauma exposure were entered in Step 1, and in Step 2 peritraumatic dissociation and emotion dysregulation were entered simultaneously. Results of this model indicated that the model was significant,  $\chi^2(5) = 49.20, p < .001, -2LL = 294.53$ , Nagelkerke  $R^2 = .24$ , and correctly classified 66.9% of cases. This model was a good fit to the data according to the Hosmer and Lemeshow test,  $\chi^2(8) = 2.23, p = .61$ . In this model, both peritraumatic dissociation and emotion dysregulation significantly predicted dissociative subtype membership, though nonbetrayal trauma exposure was no longer a significant predictor of subtype membership.

In order to test for the moderating effects of betrayal trauma, we conducted a fourth logistic regression (Model 4). Like the previous models, age, ethnicity, and nonbetrayal trauma exposure were entered in the first step as covariates. In Step 2,

peritraumatic dissociation and emotion dysregulation were entered. In Step 3, betrayal trauma and the interactions between peritraumatic dissociation and betrayal trauma and emotion dysregulation and betrayal trauma were entered. Results of this model indicated that the model was significant,  $\chi^2(5) = 51.95, p < .001, -2LL = 290.36$ , Nagelkerke  $R^2 = .25$ , and correctly classified 66.8% of cases. This model was a good fit to the data according to the Hosmer and Lemeshow test,  $\chi^2(8) = 7.00, p = .54$ . Additionally, results of this model indicated that betrayal trauma did not moderate the likelihood of subtype membership; peritraumatic dissociation and emotion dysregulation were the only significant predictors of dissociative subtype membership in this model.

A fifth logistic regression was conducted to determine whether gender moderated the effects of the other variables on the likelihood of subtype membership. In Step 1, age, ethnicity, and nonbetrayal trauma exposure were entered as covariates. In Step 2, peritraumatic dissociation and emotion dysregulation were entered. In Step 3, gender and the interactions between peritraumatic dissociation, and gender and emotion dysregulation, were entered. Results of this model indicated that the model was significant,  $\chi^2(8) = 50.39, p < .001, -2LL = 293.35$ , Nagelkerke  $R^2 = .25$ , and correctly classified 65.7% of cases. This model was a good fit to the data according to the Hosmer and Lemeshow test,  $\chi^2(8) = 11.73, p = .16$ . Furthermore, results demonstrated that gender did not moderate subtype membership; as before, peritraumatic dissociation and emotion dysregulation were the only variables that significantly increased the odds of dissociative subtype membership.

Finally, a sixth logistic regression was conducted with all study variables. In Step 1, age, ethnicity, and nonbetrayal trauma exposure were entered as covariates. In Step 2,

peritraumatic dissociation and emotion dysregulation were entered. In Step 3, gender and betrayal trauma were entered. In Step 4, interactions between peritraumatic dissociation, emotion dysregulation, gender, and betrayal trauma were entered. Two 3-way interactions were included in this model: the interaction between peritraumatic dissociation, gender, and betrayal trauma; and the interaction between emotion dysregulation, gender, and betrayal trauma. These were the only 3-way interactions entered because these were the only 3-way interactions that could potentially be interpreted based on prior research and theory. Results of this model demonstrated that the model was significant,  $\chi^2(8) = 52.61, p < .001, -2LL = 289.70, \text{Nagelkerke } R^2 = .26,$  was a good fit to the data, and correctly classified 66.0% of cases. Furthermore, this model was a good fit to the data according to the Hosmer and Lemeshow test,  $\chi^2(8) = 3.17, p = .92.$  As in the previous models, peritraumatic dissociation and emotion dysregulation remained the only significant predictors of dissociative subtype membership. Table 2 shows regression coefficients, Wald statistics, odds ratios, and 95% confidence intervals for odds ratios for all logistic regression models.



Table 1

*Descriptive Statistics and Intercorrelations Among Study Variables*

Variable	Mean	SD	1.	2.	3.	4.	5.	6.	7.
1. Peritraumatic Dissociation	25.43	7.38	-	.12	.23**	.04	.04	.19**	-.06
2. Emotion Dysregulation	94.38	20.88		-	.14*	-.06	.11	-.14*	-.07
3. Betrayal Trauma	2.13	1.41			-	.09	.23**	-.38**	-.01
4. Age	16.10	1.23				-	.08	-.07	.03
5. Nonbetrayal Trauma	4.54	2.03					-	-.05	.03
6. Gender								-	-.03
7. Ethnicity									-

*Note.* N=248. \* $p < .05$ . \*\* $p < .01$

Table 2

*Summary of Binary Logistic Regressions for Predicting Dissociative Subtype Membership*

Predictor	B	SE B	Wald's $\chi^2$	Odds Ratio	95% CI for Odds Ratio
Model 1: Main Effect of Peritraumatic Dissociation					
Age	-.08	.11	.46	.93	(.74, 1.16)
Ethnicity	.07	.11	.41	1.07	(.87, 1.33)
NBTE	.15	.07	4.44	1.16*	(1.01, 1.33)
PD	.10	.02	23.75	1.10***	(1.06, 1.15)
Model 2: Main Effect of Emotion Dysregulation					
Age	-.03	.11	.07	1.06	(.78, 1.31)
Ethnicity	.06	.11	.31	.97	(.86, 1.21)
NBTE	.18	.07	6.67	1.19*	(1.04, 1.36)
ED	.03	.01	13.97	1.03***	(1.01, 1.04)
Model 3: Main Effects Simultaneously					
Age	-.05	.12	.19	.95	(.76, 1.19)

Table 2 Continued

Predictor	B	SE B	Wald's $\chi^2$	Odds Ratio	95% CI for Odds Ratio
Model 3: Main Effects Simultaneously					
Ethnicity (.88, 1.37)	.10	.11	.71	1.10	
NBTE	.13	.07	3.09	1.14	(.99, 1.31)
PD	.10	.02	21.97	1.10***	(1.06, 1.15)
ED	.03	.01	12.09	1.03**	(1.01, 1.04)
Model 4: Moderating Effect of Betrayal Trauma					
Age	-.06	.12	.31	1.09	(.88, 1.37)
Ethnicity	.09	.11	.62	.94	(.75, 1.18)
NBTE	.13	.08	3.06	1.14	(.98, 1.32)
PD	.10	.02	21.60	1.10***	(1.06, 1.15)
ED	.03	.01	11.96	1.03***	(1.01, 1.04)
BT	.02	.11	.04	1.02	(.83, 1.26)

Table 2 Continued

Predictor	B	SE B	Wald's $\chi^2$	Odds Ratio	95% CI for Odds Ratio
Model 4: Moderating Effect of Betrayal Trauma					
PDxBT	.02	.02	2.42	1.03	(.99, 1.06)
EDxBT	.00	.01	.43	1.00	(.99, 1.01)
Model 5: Moderating Effect of Gender					
Age	-.05	.12	.19	.95	(.76, 1.19)
Ethnicity	.10	.11	.75	1.10	(.88, 1.38)
NBTE	.12	.07	2.58	1.13	(.97, 1.30)
PD	.13	.04	11.09	1.14**	(1.06, 1.23)
ED	.03	.01	5.54	1.03*	(1.01, 1.06)
Gender	.03	.31	.01	1.03 (.59, 1.87)	
PDxGender	-.05	.05	1.03	.95	(.87, 1.04)
EDxGender	-.01	.02	.06	1.57	(.96, 1.02)

Table 2 Continued

Predictor	B	SE B	Wald's $\chi^2$	Odds Ratio	95% CI for Odds Ratio
Model 6: Main Effects, Moderating Effects, and Interactions					
Age	-.06	.12	.28	.94	(.75, 1.18)
Ethnicity	.10	.12	.73	1.10	(.88, 1.38)
NBTE	.12	.08	2.65	1.13	(.98, 1.31)
PD	.11	.04	7.86	1.12**	(1.04, 1.21)
ED	.03	.01	4.57	1.03*	(1.00, 1.06)
Gender	.12	.33	.13	.72	(.59, 2.17)
PDxBT	.03	.03	1.07	1.03	(.97, 1.09)
EDxBT	.00	.01	.00	1.00	(.98, 1.02)
PDxGender	-.02	.05	.24	.98	(.89, 1.07)
EDxGender	.00	.02	.05	1.00	(.96, 1.03)

Table 2 Continued

Predictor	B	SE B	Wald's $\chi^2$	Odds Ratio	95% CI for Odds Ratio
Model 6: Main Effects, Moderating Effects, and Interactions					
PDxBTxGender	-.01	.04	.10	.99	(.92, 1.06)
EDxBTxGender	.00	.01	.14	1.00	(.98, 1.03)

*Note.* N = 248. NBTE = Nonbetrayal Trauma Exposure. PD = Peritraumatic Dissociation. ED = Emotion Dysregulation. BT = Betrayal Trauma. PDxBT = Peritraumatic Dissociation by Betrayal Trauma Interaction. EDxBT = Emotion Dysregulation by Betrayal Trauma Interaction. PDxGender = Peritraumatic Dissociation by Gender Interaction. EDxGender = Emotion Dysregulation by Gender Interaction. PDxBTxGender = Peritraumatic Dissociation by Betrayal Trauma by Gender Interaction. EDxBTxGender = Emotion Dysregulation by Betrayal Trauma by Gender Interaction. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

## DISCUSSION

The first aim of this study was to confirm the dissociative subtype in a group of traumatized adolescents. Results demonstrated that 50.8% of youth were members of the dissociative subtype. This rate is higher than in previous studies of adult samples (e.g., Armour et al., 2014; Wolf et al., 2012a, 2012b), and thus suggests the possibility that depersonalization and derealization may be more common in adolescents with PTSD, particularly those drawn from a justice-involved population. Additionally, this high rate of dissociative subtype membership raises the question of whether or not depersonalization and derealization are the best ways to distinguish adolescent members of the dissociative subtype. Although the reason for defining the definition to dissociative subtype membership as depersonalization or derealization was because these symptoms are relatively rare in individuals with PTSD (Lanius et al., 2014), this may not be true for adolescents. Future research should continue to investigate rates of the dissociative subtype in diverse groups of adolescents with various levels of trauma exposure and posttraumatic stress symptoms in order to evaluate whether the current findings of high rates of the dissociative subtype are consistent among different populations of adolescents.

The second aim of the study was to investigate whether specific factors affected the likelihood of membership in the dissociative subtype. We ran a series of logistic regressions to determine whether peritraumatic dissociation and emotion dysregulation

affected the likelihood of dissociative subtype membership and if these variables were moderated by betrayal trauma exposure or gender. Results indicated that our first hypothesis was supported. Youth with greater levels of peritraumatic dissociation had an increased likelihood of being members of the dissociative subtype. Additionally, results supported our second hypothesis, given that youth with higher levels of emotion dysregulation were more likely to be members of the dissociative subtype. It should also be noted that when these variables were entered simultaneously rather than separately in the same model (Model 3), the model correctly predicted most cases (66.9%). This suggests that the combination of these variables may be particularly useful in predicting dissociative subtype membership and that youth who report higher levels of both peritraumatic dissociation and emotion dysregulation may be particularly prone to subtype membership. Furthermore, this finding aligns with previous research demonstrating that peritraumatic dissociation and emotion dysregulation are associated with both persistent dissociation (Bennett et al., 2015; Modrowski & Kerig, 2014; Powers et al., 2015) and elevated posttraumatic stress symptoms (Tull, Barrett, McMillan, & Roemer, 2007; Weiss et al., 2012) in adolescents.

We also investigated whether betrayal trauma exposure moderated the likelihood of subtype membership (Hypothesis 3). Results did not support any moderating effects of betrayal trauma exposure. Thus, although previous research has demonstrated that betrayal trauma exposure is associated with dissociation, results of the current study suggest that betrayal trauma exposure may not be a strong predictor of dissociative subtype membership in the current sample. Considering that the sum of nonbetrayal trauma exposure was a significant predictor in some of our models, it is possible that the



cumulative number of traumatic events, rather than the type of traumatic event, is more salient in predicting dissociative subtype membership and should be a focus of future research.

Furthermore, we investigated whether gender moderated the likelihood of subtype membership. This hypothesis (Hypothesis 4) was not supported, with results demonstrating that gender did not affect subtype membership. This finding aligns with previous research that has also failed to find gender differences between members and nonmembers of the dissociative subtype (Armour, Karstoft, & Richardson, 2014). However, considering that some other studies have found gender differences between members and nonmembers of the subtype, future research would likely benefit from continuing to investigate potential gender differences in those individuals who do and do not meet criteria for the dissociative subtype.

The current study has a number of strengths, including examining the dissociative subtype of PTSD in a sample of adolescents with high rates of chronic and interpersonal trauma exposure. However, the results should be considered in light of a number of limitations. First, results are based on youth self-reports; future research should consider using multiple informants and methods to assess trauma exposure and dissociation. Additionally, data were collected as part of a cross-sectional study, which limits our ability to make temporal or causal statements about the associations among betrayal trauma exposure, emotion dysregulation, peritraumatic dissociation, and membership in the dissociative subtype. In addition, this study utilized DSM-IV PTSD criteria, and thus estimates of PTSD in the current study may be underestimations of PTSD rates according to DSM-5 criteria (Carmassi et al., 2013). The current study also included youth with

partial PTSD, which affects our ability to make direct comparisons to dissociative subtype rates in previous studies of adults that have included only those who met full criteria for the disorder. Finally, given that justice-involved youth often experience higher levels of trauma and posttraumatic stress symptoms than clinical and community samples of adolescents, results of the current study may not generalize to all adolescent populations.

Results of the current study have a number of clinical implications for those professionals working with traumatized adolescents. First, just over half of youth in this sample (50.8%) met criteria for the dissociative subtype, and therefore clinicians should be made aware that the co-occurrence of posttraumatic stress symptoms and dissociative symptoms might be more common in youth than in adults. This implies that clinicians should consider assessing dissociative symptoms in all youth with PTSD. Additionally, given that youth with greater emotion dysregulation and peritraumatic dissociation had the largest odds of being categorized in to the dissociative subtype, clinicians should be particularly diligent to inquire about peritraumatic dissociation and current emotion dysregulation symptoms.

In conclusion, this is one of the first studies to investigate the dissociative subtype and the theoretically driven factors that may affect the likelihood of the dissociative subtype in a sample of traumatized detained adolescents. Results demonstrate that approximately half of youth met criteria for the dissociative subtype and that peritraumatic dissociation and emotion dysregulation significantly predicted membership in the dissociative subtype. These results have important implications for identifying those youth who may be particularly vulnerable to dissociative subtype membership and

suggest that rates of the dissociative subtype may be higher in adolescents than in adults. Future research should continue to investigate the dissociative subtype in traumatized youth populations in order to disentangle those youth who are at the highest risk for experiencing dissociation following a traumatic event.

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