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**THE RELATIONSHIP BETWEEN DISSOCIATION AND SUBSEQUENT INTRUSIONS  
IN CONTEXT OF TRAUMA EXPOSURE**

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*Abstract: Repeated intrusions of the traumatic events are core symptoms of posttraumatic stress disorder (PTSD), described as exceptionally vivid and rich in sensory detail (Brewin & Holmes, 2003). Several studies found dissociation, both trait dissociation and peritraumatic state dissociation, to be a risk factor for PTSD development after trauma-exposure (Briere, Scott, & Weathers, 2005; Lensvelt-Mulders, van der Hart, van Ochten, van Son, Steele, & Breeman, 2008). Trait dissociation is considered a relatively stable trait and it refers to a reduced awareness of one's surroundings marked by symptoms such as depersonalization, emotional numbing, and altered sense of time. State dissociation refers to a temporary dissociative state, during and right after the trauma. The role of dissociation is not without controversy since there are studies that deny the fact that it is an independent predictor of PTSD (Hagenaars & Krans, 2011). Certain contradictions can be explained by the fact that the relationship between dissociation and PTSD development is more complex and could be mediated by the presence of other variables. In this paper, we present the effect of dissociation on the development of intrusive symptoms of PTSD, as well as the possible explanations of the contradictory results.*

*Keywords: trait dissociation, state dissociation, intrusions*

**Trauma exposure and posttraumatic stress symptoms**

In the aftermath of a traumatic life event, persons may develop a constellation of symptoms such as anxiety, depression, or event posttraumatic stress disorder (PTSD). Posttraumatic stress disorder is a distressing and disabling condition characterised by avoiding stimuli associated with the traumatic event(s) (e.g people, places, conversations, activities, objects, situations), reexperiencing of the trauma (e.g recurrent, involuntary, and intrusive distressing memories of the traumatic event), physiological hyperarousal (e.g problems with concentration, sleep disturbance), and negative alterations in cognitions and mood associated with the traumatic event (e.g negative beliefs or expectations about oneself, others, or the world). In this context, a traumatic event is defined as one involving exposure to actual or threatened death, serious injury, or sexual violence, directly or secondary (e.g witnessing the event as it occurred to others) (*Diagnostic and Statistical Manual of Mental Disorders*, 5th ed. [DSM-V]; American Psychiatric Association, 2013). Intrusions of the trauma, described as exceptionally vivid and rich in sensory detail, are hallmark symptom of posttraumatic stress disorder that have received considerable attention from researchers (Brewin & Holmes, 2003). However, a minority of the victims develop posttraumatic stress disorder symptoms, which has led to numerous studies exploring risk and protective factors (Galea, Nandi, & Vlahov, 2005). A factor frequently linked to PTSD development (McCaslin et al., 2008; Ozer, Best, Lipsey, & Weiss, 2003) is dissociation, both state and trait.

**Peritraumatic dissociation**

Peritraumatic dissociation include alterations in the perception of space, time and the self, occurring during or immediately in the aftermath of a traumatic experience (Martin & Marchand, 2003). These alterations leads to depersonalization (e.g feeling disconnected from one's body), derealization, altered sense of time, feeling disoriented, confusion, amnesia,

numbing or detachment (Briere et al., 2005). During the last years, retrospective and prospective studies report a relationship between peritraumatic dissociation during or shortly after a trauma exposure and the development of posttraumatic stress symptoms (e.g., Birnes et al., 2003; Laposa & Rector, 2012; Kumpula, Orcutt, Bardeen, & Varkovitzky, 2011). Moreover, the results of a meta-analysis showed that peritraumatic dissociation is a stronger predictor of PTSD than pre- or posttraumatic variables (Ozer et al., 2003). Nevertheless, previous studies showed that peritraumatic dissociation has an important influence only in the etiology of initial posttraumatic symptoms (Bryant, 2007), but does not explain more distal symptomatology (van der Velden & Wittmann, 2008). Thus, it is possible that peritraumatic dissociation to contribute to the onset of posttraumatic stress symptoms, while other factors may account for the maintenance of symptoms across time (Kumpula et al., 2011).

According to some researchers, dissociation allows an individual to separate from his or her psychic and physical pain caused by the trauma (Briere et al., 2005). From this point of view, dissociation can be considered a defense mechanism, that may help a person to cope with strong emotions, by limiting the awareness of threatening and overwhelming experiences (e.g., Bryant, 2007). However, the adaptive function of peritraumatic dissociation appears only shortly after trauma exposure, as it has been associated with development of PTSD symptomatology (Briere et al., 2005).

Trying to explain the mechanism linking peritraumatic dissociation to posttraumatic stress symptomatology, some researchers sustain that this association is explained by the fact that dissociative experiences during a trauma life event may interfere with the formation or organization of memories, impeding the integration of the trauma into the autobiographical memory system (van der Kolk & Fisler, 1995). Some empirical evidences sustain the fact that peritraumatic dissociation is associated with the development of disorganized and fragmented memories and posttraumatic stress symptoms (Halligan, Michael, Clark, & Ehlers, 2003). If depersonalisation, derealisation and numbing not allow the conceptual processing during the trauma to occur, then the trauma memories are difficult to control and retrieve intentionally. Studies showed that persons with posttraumatic stress have a low ability to recall different aspects of the trauma due to the fact that memories about trauma experience are often fragmented and poorly organized (Koss, Figueredo, Bell, Tharan, & Tromp, 1996). A theoretical framework that explain the particularities of trauma memories in persons with posttraumatic stress symptoms is the dual-representation theory of PTSD (Brewin, Dalgleish, & Joseph, 1996). According to this theory, information that are relatively consciously processed during trauma exposure are stored in a memory system called verbally accessible memory (VAM). These information can be retrieved voluntarily in any moment of life. By contrast, when information is not consciously processed, it is stored in situationally accessible memory (SAM) and it can not be retrieved voluntarily. The information stored in SAM system (mostly sensory, visuospatial information without temporal context) can be accessed automatically by exposure to relevant cues and may lead to intrusions of the trauma (e.g detailed visual images, flashbacks). Peritraumatic dissociation restricts conscious processing and prevent verbal encoding, so information is stored in SAM. As a consequence, more posttraumatic stress symptoms, especially intrusions, can occur. A similar point of view is sustained by Ehlers and Clark's (2000) cognitive model of PTSD. According to this theoretical model, processing sensory impressions rather than conceptual processing (processing meaning and context) is associated with later intrusions.

### **Trait dissociation**

Trait dissociation is defined as a relatively stable tendency to experience dissociative symptoms (Hagenaars & Krans, 2011) and it represent a chronically vulnerability to stress (Hagenaars, Van Minnen, & Hoogduin, 2010). Moreover, several empirical research showed

that it is a risk factor for posttraumatic stress symptoms, particularly intrusions, in context of trauma exposure (Briere et al., 2005; McCaslin et al., 2008; Murray, Ehlers & Mayou, 2002).

Because dissociative symptoms during or shortly after trauma are considered coping mechanisms, these symptoms are conditioned by the ability to have dissociative experiences (Hagenaars & Krans, 2011). Especially, some researchers assumed that a high level of trait dissociation should facilitate the occurrence of peritraumatic dissociative symptoms. Several empirical studies support this assumption, showing positive associations between trait and spontaneous state dissociation (McCaslin et al., 2008; Zoellner, Sacks, & Foa, 2007). Moreover, the studies using a laboratory dissociation induction also showed that a high level of trait dissociation was related to more dissociative symptoms (Leonard, Telch, & Harrington, 1999). Although both state and trait dissociation were linked to symptoms of intrusions, the differential or cumulative effect of these variables has been less examined. A study that do examined the relation between trait dissociation, state dissociation and intrusions found that trait dissociation predicted the frequency of intrusive images, and trait dissociation was also related to state dissociation but the latter variable did not predict intrusion frequency (Hagenaars & Krans, 2011). An interesting results of this study is the fact that the effect of trait dissociation on intrusive images was no longer significant after controlling for peri-traumatic emotions (e.g horror). Therefore, the assumption that the trait dissociation – posttraumatic stress symptoms relation may be mediated by state dissociation, as state dissociation seem to be a strong predictor of posttraumatic stress (Brewin et al., 2000), and trait dissociation is associated with state dissociation (Zoellner et al., 2007), was not sustained. Trait dissociation was associated with more peri-trauma state dissociation, but this path did not go further, to explain the occurrence of intrusions.

#### **Somatoform dissociation**

Another form of dissociation, less studied, is somatoform dissociation, manifested in somatic variables and defined by a disintegration of somatoform components of experience, that may lead to analgesia and psychogenic seizures (Hagenaars, Van Minnen, Holmes, Brewin, & Hoogduin, 2008). Especially, life events involving a threat to life were found to induce peritraumatic somatoform dissociative responses (Pitman, Van der Kolk, Orr, & Greenberg, 1990). Nevertheless, very few studies have explored the relation between somatoform dissociation and posttraumatic stress symptoms. Studies that do exist support the fact that trauma life events can lead to somatoform dissociation (Dietrich, 2003) and also showed that somatoform dissociation was strongly related to posttraumatic stress symptoms (El-Hage, Darves-Bornoz, Allilaire, & Gaillard, 2002). More research is needed to clarify the effect of somatoform dissociation on information processing during trauma and future symptomatology.

#### **Controversary findings**

Although peritraumatic dissociation has often been studied in the last years and has proven to be a stronger predictor of posttraumatic stress symptoms than other factors such as prior trauma and perceived life-threat during the trauma (Breh & Seidler, 2007; Lensvelt-Mulders et al., 2008; Ozer et al., 2003), the role of dissociation is not without controversy. This controversy is generated by the fact that some studies fail to demonstrate that peritraumatic dissociation is an independent predictor of posttraumatic stress responses (e.g., Marshall & Schell, 2002; Simeon, Greenberg, Nelson, Schmeidler, & Hollander, 2005). Moreover, the results of a review of prospective studies suggests that peritraumatic dissociation may have a weak effect in predicting posttraumatic stress symptoms beyond three months post-trauma (Simeon et al., 2005; van der Velden & Wittmann, 2008). Consistent with this point of view, numerous researchers have showed that peritraumatic dissociation does not predict posttraumatic stress symptoms beyond mental health problems assessed soon after trauma exposure (e.g., van der Velden et al., 2006; Wittmann, Moergeli, & Schnyder, 2006).

The fact that the predictive power of peritraumatic dissociation disappears after controlling for other stress-related factors (e.g., van der Velden et al., 2006; Wittmann et al., 2006), especially for initial posttraumatic stress symptoms (Hagenaars, Van Minnen, & Hoogduin, 2007; Marshall & Schell, 2002), may mean that other factors may exert a stronger influence on the maintenance of symptoms across time (Kumpula et al., 2011).

However, many studies on the relation between peritraumatic dissociation and posttraumatic stress symptoms are retrospective and limited by methodological shortcomings such as forgetting, attribution of symptoms, and over-reporting (Candel & Merckelbach, 2004). Therefore, the reliance on these reports is questionable because of possible bias in recollections over time and memory retrieval (Harvey & Bryant, 2000). Previous studies showed that recall of peritraumatic dissociation can vary over time, and changes in recall of peritraumatic dissociation are strongly correlated with changes in posttraumatic stress symptoms (Marshall & Schell, 2002). Furthermore, mixed results may be explained by the fact that studies differed in the way participants were asked to assess peritraumatic dissociation. For example, in some studies participants were asked to focus on peritraumatic dissociation during the event (Gershuny, Cloitre, & Otto, 2003), while in others participants were asked to focus during and immediately after the event (Jaycox, Marshall, & Orlando, 2003). There are also some researchers that asked participants to recall experiences of peritraumatic dissociation in context of trauma exposure, but did not specify a time context (Holeva & Tarrier, 2001).

In order to limit the methodological variability and heterogeneity of trauma types across studies, some researcher proposed that experimental, laboratory-based studies about the relation between dissociation and subsequent symptoms of intrusions are more useful (Hagenaars et al., 2008). There are some experimental studies that have examined the relationship between peritraumatic dissociation and traumatic intrusion development (Kindt, Van den Hout, & Buck, 2005). In these studies, participants are exposed to an aversive film, then they report spontaneously occurring dissociation during the exposure, and intrusion frequency 1 week later. Unfortunately, experimental studies reported mixed results, too. While some studies identified a relation between peritraumatic dissociation and subsequent intrusions (Kindt et al., 2005), this relationship was not found in another study using a similar design (Stuart, Holmes, & Brewin, 2006). Other laboratory studies have experimentally induced dissociation (Holmes, Brewin, and Hennessy, 2004) by asking participants to stare at a dot during a distressing film. The results showed that increases in state dissociation were related to more reported intrusions but, unexpected, there were no differences in intrusion frequency in the next week between experimental and control conditions. Another form to induce peritraumatic dissociation imply asking participants to watch an aversive film in a hypnotically induced dissociative state (Holmes, Oakley, Stuart, & Brewin, 2006). During a part of the film participants received suggestions for depersonalisation and derealisation. Results showed that dissociation was successfully induced, but had no effect on subsequent intrusions (participants reported no more intrusive memories of film sections in which they received dissociation instructions).

### **Conclusions**

Previous studies showed that a possible consequence of trauma exposure is the development of posttraumatic stress symptoms. A risk factor for posttrauma reaction is dissociation, both as state, as a trait (Birmes et al., 2003). Peritraumatic dissociation received considerable attention in empirical studies. Results showed that it is a strong predictor factor in posttraumatic stress development, although nonsignificant results were also reported. An explanation for the mixed findings is the fact that most studies are methodologically flawed. Experimental studies may provide a good alternative, though previous studies of induced dissociation failed to find the predicted increase in intrusion. Future research is needed to

clarify the nature of relation between peritraumatic dissociation and intrusion development. Moreover, studies should focus on a less studied form of dissociation - somatoform compartmentalisation (akin to the freezing response). A field that should also receive some attention is secondary exposure to trauma. A small number of studies checked for the relation between peritraumatic dissociation and post-traumatic reactions among persons indirectly exposure to trauma (e.g rescue personnel) (Fullerton, Ursano, & Wang, 2004). Among these persons, exposure to human pain may be one of the most traumatizing experiences and a risk factor for subsequent posttraumatic stress symptoms (Ursano & McCarroll, 1990). These studies neglected the peritraumatic dissociation and its influence during and after exposure to a traumatic event (Guthrie & Bryant, 2005). Early identification of trauma victims who are at risk to develop posttraumatic stress symptoms would help in planning for adequate healthcare interventions (Koopman, Classen, & Spiegel, 1994).

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