During a **traumatic event** an individual may suffer alterations in the experience of time, place, and person, which making the traumatic event feel unreal. This way of processing information during a traumatic experience, or subsequently, has been **conceptualized as traumatic dissociation** (Van der Kolk, Van der Hart, & Marmar, 1996). According to Van der Kolk (2014), dissociation is the essence of trauma, and refers to the a compartamentalization of experience where the elements of trauma are not integrated into a sense of self or a unitary whole. The **dissociative symptoms** may manifest as psychological or as bodily phenomena and include disrupted memory encoding, affect compartmentalization, and time distortion and fugue.

The term “dissociation” refers to three distinct but related mental health phenomena, one of which is peritraumatic dissociation, also called “secondary dissociation” (Van der Hart, Van der Kolk, & Boon, 1996). Marmar and his colleagues (1994) have described peritraumatic dissociation as an alteration in the experience of time place and person that make the occurring event seem unreal. Some of the symptoms they describe in this type of dissociation include experiencing that time is going slower or faster, despersonalization, out-of-body experiences, confusion, bewilderment, disorientation, altered perception of pain, tunnel vision, and altered body image.

Over a century ago Pierre **Janet** (1907) described as the main problem of severely traumatized victims the **inability to emotionally process traumatic memories**. According to Janet’s clinical observations, in the wake of traumatic experiences, the self lacks the capacity to incorporate into its structure emotions and memories resulting from the trauma. Thus, the traumatic experience is not available to normal conscious representation, and therefore cannot be processed, persisting as a fixed idea that is split off from consciousness and distorts subsequent experiences. Unlike normal memories, traumatic memories are not associated with an internal sense of self, and consequently, the retrieval of those memories are not under voluntary control (Bower and Sivers, 1998). Nevertheless, the sensory fragments of the traumatic experiences can be revived in consciousness when associated to external cues similar to those of the original traumatic experience, which could explain the **relationship between peritraumatic dissociative experiences and intrusive thoughts or flashbacks**, key symptoms of Post Traumatic Stress Dissorder (PTSD; American Psychiatric Association, 2013).

PTSD

According to the most recent version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5, American Psychiatric Association, 2013), trauma is defined as any situation of exposure to death, serious injury or actual or threatened sexual violence, directly or as a witness. Traumatic experiences produce strong emotional reactions in most people. Only a minority, but significant group, of those who experience a trauma will develop long-term emotional sequelae, such as Posttraumatic Stress Disorder (PTSD; Cova, Rincon, Grandón, & Vicente, 2011). PTSD is characterized by involuntary re-experience of trauma through involuntary, almost dreamlike images, memories and / or sensations about the trauma; Strong discomfort and / or need to escape from people, situations, places or things that remind of the event; Fear, guilt, anger, sadness, embarrassment and / or feeling of emotional dullness (Friedman, Resick, Bryant, & Brewin, 2011). It has been reported that up to 11.8% of people attending primary care services may suffer PTSD, but their diagnosis is much lower (Wade, Howard, Fletcher, Cooper, & Forbes, 2013, Grinage 2003; Stein, McQuaid, Pedrelli, Lenox, & McCahill, 2000).

Unlike what was previously thought, the experience of having lived a trauma is very frequent in the life of the people, varying the frequency between different countries. For example, in a study almost 80% of the population in Mexico reported having experienced a traumatic event in their lifetime, compared to Germany, where only slightly above 20% reported the same (Norris et al., 2003; Perkonigg, Kessler, Storz, & Wittchen, 2000). In the United States and Australia the figure was just over 50% (Creamer, Burgess, & McFarlane, 2001; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Chile has an intermediate situation: almost 40% of Chileans report having experienced a trauma at some time in their lives (Zlotnick et al., 2006).

The incidence of PTSD after trauma varies according to the type of trauma, its severity, duration and the amount of time that has passed since the event occurred. In general terms, one out of seven people (14%) are described as having long-term emotional sequelae following trauma, such as PTSD, post-traumatic depression or anxiety disorders (Kessler, Sonnega, Bromet, Hughes, & Nelson (1995), Norris et al., 2003; Zlotnick et al., 2006). PTSD is more frequent in women than in men, with a 2: 1 ratio (Breslau, 2001). Other risk factors include a low perception of social support and a high perception of post-trauma stress (Ozer, Best, Lipsey, & Weiss, 2003), a high perception of vital risk during trauma, physical sequelae and previous psychiatric history. It is important to note, however, that none of these factors increases the risk by more than 50% (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003).

The results of two well-known meta-analysis (Brewin et al., 2000; Ozer et al., 2003) reveal that the variables that have been proven to be relevant predicting PTSD symptoms one month after suffering a traumatic event are the following: a) demographic variables: age, sex and education; b) non-demographics personal characteristics salient for psychological processing and functioning: perceived social support, traumatic load; and c) aspects of the traumatic event or sequeale: dissociation and traumatic stress during the event.

Dissociative experiences and PTSD

During the past decades trauma research has confirmed that **dissociative experiences during a traumatic event may play a critical role in the development of trauma-related psychological disorders**, including PTSD (e.g., Van Der Kolk, Van Der Hart, & Marmar, 1996). In addition, pathological dissociation has been used as a basis for a subtype of PTSD because research has identifying a subgroup of individuals with both biological and psychological features of dissociation in addition to PTSD (Lanius, Brand, Vermetten, Frewen, & Spiegel, 2012).

According to van der Kolk (2014), due to dissociation the traumatic experience is split off and fragmented, causing sounds, images, emotions, thoughts, and physical sensations to be left unintegrated. These split off aspects would be then intrude into the present in those who suffer PTSD. As he explains “As long as the trauma is not resolved, the stress hormones that the body secretes to protect itself keep circulating, and the defensive movements and emotional responses keep getting replayed.” (pag. 66).

In a study of over 25,000 adults from 16 countries Stein et al. (2013), found that **dissociative symptoms** were present in 14% of individuals with 12-month DSM-IV/Composite International Diagnostic Interview **PTSD**. **These symptoms were associated with high counts of re-experiencing symptoms, severe role impairment, specific phobia, and suicidality. Individuals who reported dissociative symptoms were more likely to be male, have a childhood onset of PTSD, high exposure to traumatic events and childhood adversities, and prior histories of separation anxiety disorder.**

But not everyone who undergoes a traumatic experience dissociates. Research has shown that a **potential etiological factor of dissociation is that of traumatic experiences**, particularly childhood abuse (see Dutra, Bureau, Holmes, & Lyubchik, 2009 for an overview). Bernstein and Putnam (1986) found among hospital admissions that of the patients who reported highest dissociation, all of them had a history of sexual abuse, and a very high percentage also had a history of physical abuse and/or witnessing domestic violence. At the same time, a protective factor appears to be social support, since research has consistently found that having a good support network is the most powerful protection against being traumatized, and not having an adequate social support gives rise to problems such as dissociation (van der Kolk, 2014). To the best of our knowledge, existing research has not convincingly demonstrated that **age, gender, culture, and education significantly influence dissociation** (Dutra el al., 2009).

While we have advanced greatly in the understanding of dissociation, futher research is necessary to understand individual characteristics that make a person more vulnerable to experiencing peritraumatic dissociation, and how this type of dissociation, as well as other individual variables, are related to the development of PTSD in the aftermath of a traumatic event.

The **current study** focused on better understanding the role of peritraumatic dissociation. We had three objectives a) Predict which subjects would develop peritraumatic dissociation; b) Assess the role of dissociation as a predictor of PTSD symptomatology; and c) Test a mediational model with dissociation mediating between traumatic load and PTSD symptomatology. Based on the previous literature we hypothesized that: a) Traumatic load would predict dissociation even after controlling for other variables; b) Dissociation would significantly predict the development of PTSD symptoms, even after controlling for XXX; and c) Dissociation would significantly mediate between traumatic load and PTSD symptoms.

**Methods**

Design

This is a secondary analysis of a randomized clinical trial that took place between

XX and XX of 2016 in the emergency rooms of general hospitals in Santiago de Chile. Adults who came to the emergency who had experienced a recent non-intentional traumatic experience (as defined by DSM5), and who were medically able to respond to questionnaires, were invited to participate in the study. All participants signed informed consent forms, and the study was approved by the relevant ethical review boards.

Inclusion criteria: Adults (≥ 18 years old) attending the emergency service, either as a patient or companion, who have been victims of recent unintentional trauma (less than 72 hours), and who meet one of the following criteria: a) Direct victim, or witness, to a risk for life situation that; b) Direct victim, or witness, to a situation that that pose a serious risk to physical integrity. Examples of these situations include serious accidents, catastrophic illnesses, highly painful medical procedures, bad medical news, natural catastrophes, fires, witnessing the violent death of another person, explosions, among others.

Exclusion criteria: a) Does not understand Spanish; b) Does not remember the traumatic experience; c) Poisoning; d) Loss of consciousness for more than 5 minutes; e) Psychosis (loss of judgment of reality); f) Children and adolescents (<18 years); g) People at risk of life or medical instability requiring the implementation of life support measures incompatible with the application of measures (severe fractures, wounds with severe uncontrolled hemorrhage, unbearable pain, unstable myocardial infarction); h) Relatives of imminently impaired or newly deceased persons in the emergency department in whom the offer to participate in the investigation may cause further discomfort; i) Commitment of conscience (Glasgow 2 <15); j) Direct and indirect victim of intentional trauma (eg assault, abduction, sexual abuse, terrorist act, etc.); k) Patients who are vulnerable to psychiatric disorder (excluding personality disorder), in formal medical treatment (eg, schizophrenia, mental retardation, autism, obsessive-compulsive disorder, bipolar disorder, depression, Alzheimer's, panic disorder, etc. .)

Of 953 individuals invited to participate, XX (XX%) agreed and XX (XX%) completed measures time 0 (T0) measures that included XX self-report quetionnaires. Participants were randomly assigned to a treatment XX and a Psychoeducation control group. A month later (time 1 – T1), 57 participants completed the second data collection, which included XX self-report questionnaires. Because some of the analyses of the current study require T1 data, only the 57 participants that completed T0 and T1 measures were included. Data at T0 and T1 was collected by a psychologist.

Participants

Participants were 57 adults (35 female and 22 male) who attended a hospital emergency room after experiencing or witnessing a non-intentional traumatic event. The mean age was 46.79 (SD=17.21) and the mean years of education 12.09 (SD=3.82). Regarding the most recent trauma exposure (reason why they were in the ER), 29.82% (17) were having a serious, severe or very painful medical problem; also 29.82% (17) received in a violent manner the news of family member, or other loved one, that died or was gravely injured; 26.32% (15) had been in a vehicle accident or other type of accident; 3.51% (2) witness murder or grave injury, and 10.53% (6) had other type of traumatic experience.

After being randomized, 28 of the subjects received an intervention (PAP) and 29 were in a psychoeducation control group.

**Measures**

CIDI: Administered at T0.

TQ: Administered at T0. For this study we use a total score of traumatic load, which was calculated by adding the number of traumatic experiences endorsed.

MSPSS. Administered at T0.

PCL: administered at T0 and T1.

Peritraumatic Dissociative Experiences Questionnaire (PDEQ): The PDEQ is a 10-item self-report questionnaire that was used to measure the level of peritraumatic dissociation during the last traumatic event (the one related to the participant`s visit to the ER). The items describe dissociative experiences at the time a traumatic event was occurring: moments of losing track of time or blanking out; finding oneself acting on “automatic pilot”; a sense of time changing during the event; the event seeming unreal; a feeling as if floating above the scene; a feeling of body distortion; confusion as to what was happening to the self and others; not being aware of things that happened during the event; and disorientation (Marmar, Weiss, & Metzler, 1997). Administered at T0 and T1.

**PDI:** Administered at T0 and T1.

**Data Analysis Strategy**

We included in our analyses the variables that are the focus of the current study, peritraumatic dissociation (T0) and PTSD symptomatology (T1), as well as other variables measured at T0 that have been found to predict PTSD (Brewin et al., 2000; Ozer et al., 2008): age, gender, education, perceived social support, traumatic load, and traumatic stress during the traumatic event.

We first calculated the mean and standard deviation of the former variables, as well as calculating the percentage of the participants who reported a history of each specific type of trauma.

Second, we calculated a Person correlation between PTSD symptoms at T1 and T0 quantitative variables. We used an independent t-test to see if there were significant differences in PTSD symptomatology based on gender. We then included all these T0 variables in a multiple regression predicting T1 PTSD symptomatology.

Third, we calculated a Person correlation between peritraumatic dissociation at T0 and the relevant T0 variables, and used an independent t-test to see if there were significant differences in peritraumatic dissociation based on gender. We then included all the T0 variables in a multiple regression predicting T0 peritraumatic dissociation.

Finally, we performed two causal mediation analyses, calculating Quasi-Bayesian confidence intervals, using R Statistical Package. The models were as follow:

1) Education (T0) -> peritraumatic dissociation (T0) -> PTSD symptomatology (T1)

2) Traumatic load (T0) -> peritraumatic dissociation (T0) -> PTSD symptomatology (T1)

**Results**

Descriptives

The mean peritraumatic dissociation score during the last traumatic event was 22.33 (SD=11.41), which is considered xXXX. The mean reported peritraumatic distress during the last traumatic event was 24.48 (SD=13.05), considered xxxx. And the mean traumatic load (i.e., number of traumatic events experienced before the last traumatic event) was 3.11 (SD=2.12). The most commonly reported previous traumatic experiences were: unexpected death of a family member or loved one (72%), transportation accident (37%), serious threat or injury to a family member or loved one (35%), been the victim of aggression (28%), almost drowning (26%), and being in an industrial or work accident (23%).

In addition, the mean score for perceived social support was 33.37 (SD=10.62), considered xxx, and the mean PTSD symptomatology score at T1 was 39.53 (SD=16.23). Out of the complete sample, 26 individuals (45.61%) met criteria for PTSD one month after the traumatic event, and 31 (54.39) did not.

Predicting PTSD

Regarding PTSD symptomatology a month after the traumatic event, we found a strong positive Pearson correlation with peritraumatic dissociation (r=0.49) and traumatic stress (r=0.49), a moderate positive correlation with traumatic load (r=0.32), a moderate negative correlation with perceived social support (-0.23), a moderate to weak negative association to education (-0.19), and a weak positive correlation with age (r=0.09). We found no significant differences between men (37.23) and women (40.97) in their report of PTSD symptomatology one month after a traumatic event (t = 0.83, df = 42.91, p-value = 0.41), and also no significant differences between the intervention group (36.57) and the psychoeducation control group (42.38; t = -1.36, df = 54.43, p-value = 0.18).

Through a multiple regression we predicted the level of PTSD symptomatology individuals reported a month after a traumatic event (see Table XX). As hypothesized, controlling for the intervention, peritraumatic dissociation significantly predicted PTSD symptomatology (β=0.54, SE=0.19, t =2.65, p=0.0108). Individuals who reported more dissociative symptomatology during a traumatic event were more likely to present greater PTSD symptomatology a month after the event. Gender, age, education, traumatic load, perceived social support, and traumatic stress during the event were not significant predictors of PTSD symptomatology.

Table XX: Predicting PTSD symptomatology one month after a traumatic event

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Coefficients: | |  |  |  |  |
|  | Estimate | Std. Error | t value | Pr(>|t|) |  |
| (Intercept) | 22.23911 | 11.83683 | 1.879 | 0.066 | . |
| Gender - Male | -6.67248 | 3.60394 | -1.851 | 0.0699 | . |
| Age | 0.06981 | 0.10002 | 0.698 | 0.4884 |  |
| Education | -0.34509 | 0.46615 | -0.74 | 0.4625 |  |
| Intervention – Psicoe | 7.11858 | 3.3709 | 2.112 | 0.0396 | \* |
| Traumatic load | 1.35894 | 0.85259 | 1.594 | 0.1171 |  |
| Social Support | -0.14133 | 0.17714 | -0.798 | 0.4287 |  |
| Dissociation | 0.50479 | 0.19079 | 2.646 | 0.0108 | \* |
| Traumatic stress | 0.27729 | 0.16687 | 1.662 | 0.1027 |  |

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1; Residual standard error: 12.88 on 51 degrees of freedom; Multiple R-squared: 0.4458; Adjusted R-squared: 0.3589; F-statistic: 5.129 on 8 and 51 DF, p-value: 0.0001028

Predicting dissociation

Regarding peritraumatic dissociation, we found a positive medium strength correlation with traumatic load (r=0.24), a moderate negative correlation with perceived social support (r=-0.20), a weak negative correlation with years of education (r=-0.12), and a weak positive correlation with age (r=0.11). An independent t-test showed that there were no significant differences between men (22.95) and women (21.94) in their report of peritraumatic dissociation (t = -0.32, df = 44.58, p-value = 0.75).

Because peritraumatic dissociation during a traumatic event proved to be the most significant predictor of PTSD, which is consistent with previous findings (Ozer et al., 2008) we tried to understand what predicts dissociation (see Table XX). For this we used a larger sample, since we only needed T0 data. As hypothesized, peritraumatic dissociation was significantly predicted by traumatic load (β=0.82, SE=0.38, t =2.17, p=0.032) and years of education (β=- 0.96, SE=0.20, t =-4.75, p=0.0001) Individuals who reported greater traumatic load (i.e., had suffered more traumatic events in their life), and with less years of education, were more likely to present peritraumatic dissociation. Gender, age, and perceived social support were not significant predictors of peritraumatic dissociation.

Table XX: Predicting peritraumatic dissociation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Coefficients: | |  |  |  |  |
|  | Estimate | Std. Error | t value | Pr(>|t|) |  |
| (Intercept) | 40.67025 | 5.08483 | 7.998 | 0.0001 | \*\*\* |
| Traumatic load | 0.81886 | 0.37829 | 2.165 | 0.0317 | \* |
| Sex Male | -1.82539 | 1.65695 | -1.102 | 0.272 |  |
| Age | -0.01543 | 0.05329 | -0.29 | 0.7724 |  |
| Education | -0.95519 | 0.20126 | -4.746 | 0.0001 | \*\*\* |
| Social Support | -0.12469 | 0.08393 | -1.486 | 0.139 |  |

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1; Residual standard error: 11.16 on 187 degrees of freedom; Multiple R-squared: 0.1637; Adjusted R-squared: 0.1414; F-statistic: 7.323 on 5 and 187 DF, p-value: 2.731e-06

Mediation models

As a next logical step in trying to understand the role of peritraumatic dissociation we tried mediational models in which each of the significant predictors of dissociation (traumatic load and education) were included as meditional variables. Contrary to our hypothesis, dissociation was not a significant mediator between traumatic load and PTSD symptomatology (p=0.33; see Table XXX). Also contrary to our hypothesis, education was not a significant mediator between traumatic load and PTSD symptomatology.

Table XX: Peritraumatic dissociation as a mediator between traumatic load and PTSD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | 95% CI Lower | 95% CI Upper | p-value |
| ACME | 0.588 | -0.389 | 2.058 | 0.25 |
| ADE | 1.331 | -1.435 | 4.105 | 0.34 |
| Total Effect | 1.919 | -0.945 | 4.674 | 0.18 |
| Prop. Mediated | 0.234 | -1.787 | 2.831 | 0.33 |
| Sample Size Used: 57; Simulations: 10000 | | |  |  |

Table XX: Peritraumatic dissociation as a mediator between years of education and PTSD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | 95% CI Lower | 95% CI Upper | p-value |
| ACME | 0.599 | -0.369 | 2.057 | 0.25 |
| ADE | 1.338 | -1.468 | 4.137 | 0.35 |
| Total Effect | 1.936 | -0.978 | 4.762 | 0.18 |
| Prop. Mediated | 0.235 | -1.749 | 3.032 | 0.33 |
| Sample Size Used: 57; Simulations: 10000 | | |  |  |

Discussion

With a medical sample of adults who attended the ER after experiencing or witnessing a traumatic event, we assessed the role of peritraumatic dissociation in the development of PTSD. In order to do this, we studied the relationship between peritraumatic dissociation and variables that have been proven (Brewin et al., 2000; Ozer et al., 2008) to be relevant predicting PTSD symptoms: a) demographic variables: age, sex and education; b) non-demographics personal characteristics salient for psychological processing and functioning: perceived social support, traumatic load; and c) aspects of the traumatic event or sequeale: traumatic stress during the event.

Persons who reported experiences more dissociative experiences were more likely to develop PTSD. In addition, those who are less educated are more likely to dissociate more. At the same time, the greater the number of previous traumatic experiences, the more likely it is that a person will dissociate when experiencing a new traumatic event.

We did not find that dissociation is a significant moderator between traumatic load, nor education, and PTSD symptomatology, possibly due to our small sample size. Future research should replicate these analyses with greater samples.

Even though we could not prove a mediational role for dissociation, our findings prove that dissociation is the most important predictor for PTSD. Traumatic load, as well as education, predict who will dissociate most during a traumatic event. Persons with a larger traumatic load (i.e., report more traumatic events in their history), and who are less educated, are more likely to dissociate during a traumatic event. And those who dissociate most, are more likely to develop PTSD a month after the event. Our results are consistent with previous literature (Brewin et al., 2000; Ozer et al., 2008).

Important clinical implications: identifying persons who dissociated most during a traumatic event (e.g., earthquake) may help predict, and prevent if adequate help or treatment is provided, PTSD symptomatology. Since we know who are at most risk for dissociating (high traumatic load and low education) it would be relevant to screen these vulnerable populations first.

Future research with greater sample size are needed to prove the mediational models presented in this paper.

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THE END ☺

(publicar en Inglés; Devin Atala puede revisar ingles a cambio de autoria)

Posibles journals

*Psychological Trauma: Theory, Research, Practice, and Policy® - may vary. Most: 28 pages double spaced*

Sugeridos por Rodrigo:

* Journal of Traumatic Stress <http://www.ejpt.net/index.php/ejpt/pages/view/guidelines> (Impact Factor: 2.624; ISI Journal Citation Reports © Ranking: 2015: 28/121 (Psychology Clinical); 39/136 (Psychiatry (Social Science). Original basic and clinical research articles (click here to download guidelines) that consolidate and expand the theoretical and professional basis of the field of traumatic stress (max 6000 words incl. abstract and references, excl. tables/figures). A possibility: *Brief reports* (2,500 words) are for pilot studies or uncontrolled trials of an intervention, case studies that cover a new area, preliminary data on a new problem or population, condensed findings from a study that does not merit a full article, or methodologically oriented papers that replicate findings in new populations or report preliminary data on new instruments.
* Journal of trauma & dissociation: ISI: 0.43
* European journal of psychotraumatology: ISI: 2.325