

Trauma Type influences Posttraumatic Stress Symptoms through Self-Esteem in a Dutch Student Sample

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Abstract

There is evidence that low self-esteem is associated with elevated posttraumatic stress symptoms (PTSS) after the experience of trauma. While a lot of research focuses on one type of trauma, there is no research examining to what degree self-esteem influences PTSS in interpersonal compared to non-interpersonal trauma groups. Using data from a Dutch student-sample, this study examines whether trauma type influences PTSS and whether this is mediated by self-esteem. In this cross-sectional study, 391 participants completed self-report measures of self-esteem, PTSS and reported what the most impactful negative life event was they experienced. Based on that event, 52 participants were grouped into the interpersonal trauma type and 339 participants were grouped into the non-interpersonal trauma type. Results show that lower rates of self-esteem and higher rates of PTSS are found more often in those who experienced interpersonal trauma in comparison to non-interpersonal trauma. After a series of regression analyses, self-esteem was added to a mediation model which confirmed the hypothesis that self-esteem partially mediates the relationship between trauma type and PTSS, even more so for the interpersonal trauma type. This study highlights the importance of self-esteem after experiencing trauma, especially for the interpersonal type, implicating interpersonal trauma has a more detrimental effect on self-esteem than non-interpersonal trauma. This study implicates the need for enhancing self-esteem in victims of trauma but acknowledge further investigation on how exactly self-esteem functions in both trauma types is needed first.

Keywords: Interpersonal, non-interpersonal, trauma type, self-esteem, PTSD, PTSS

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Posttraumatic stress disorder (PTSD) is an anxiety disorder that could develop after exposure to a traumatic life event, either by experiencing it yourself, being a witness, or through indirect exposure. It is estimated that around 70% of the world population will experience one or more traumatic events in their life (Benjet et al., 2015). Yet not all people report having PTSD after experiencing trauma, as the lifetime prevalence of the anxiety disorder is between 2.3% and 8.8%, with higher rates found in low-income countries and post-conflict settings (Atwoli et al., 2015). High rates of PTSD are also seen in first world countries like the Netherlands, where lifetime prevalence is around 7.4% (Kessler et al., 2005; de Vries & Olf, 2009). When it comes to PTSD, the DSM-V classifies four core features, with the first being intrusive and recurrent memories of the event, which is called reexperience. The second feature is the avoidance of stimuli related to the event. The third feature being an adverse change in cognitions and mood. The final core feature is that alterations in arousal and reactivity persist, such as irritability or hypervigilance (American Psychological Association, 2013). After experiencing a traumatic event, people can experience a set of posttraumatic stress symptoms (PTSS) in the first months following the event which usually get less intense over time until they disappear (Bryant et al., 2017). PTSS are subclinical and must persist over a longer period to develop into PTSD. Because not everyone develops PTSD after a traumatic event, there must be factors at play that affect the occurrence and severity of PTSS. By examining what gives rise to PTSS, psychologists can further understand the aetiology of PTSD and its risk and protective factors.

There is increasing evidence that suggest self-esteem functions as a protective factor for developing PTSD (Agaibi & Wilson, 2005). Self-esteem refers to a person's global evaluation or liking of themselves in affective terms (Rosenberg, 1995) and is regarded as an important psychological factor contributing to general mental health (Mann et al., 2004; Pyszczynski et al., 2004). According to the buffer hypothesis of self-esteem by Greenberg et al. (1992), high self-esteem can be seen as a protective factor against the impact of all kinds of negative influences in life, not

only anxiety, but also antecedents of depression (Rossi et al., 2020). Available research points towards the idea that high self-esteem works as a buffer for developing PTSD too, as self-esteem is often found to be negatively associated with PTSD (Adams & Boscarino, 2006; Bradley et al., 2005; Chung et al., 2002; Kashdan et al., 2006a; Liu et al., 2018; Salami, 2010; Zhou et al., 2017). Self-esteem also relates to Ehlers and Clark's (2000) cognitive model of PTSD, specifically to the negative appraisals one has of the trauma and co-occurring emotional responses about the self. Here, having low self-esteem functions to develop and maintain PTSS. Subsequently, in trauma recovery, high self-esteem provides survivors with the confidence to be able to mobilize effective coping, which strengthens their usage of positive coping strategies to handle negative emotional outcomes (Carver & Sheier, 1998). While there is an abundance of evidence linking self-esteem to PTSS in clinical populations, there has been little research whether this counts for non-clinical populations as well. Studying non-clinical populations as well is insightful because experiencing PTSS is a precursor for PTSD and being able to identify variables that could intervene from PTSS developing into PTSD is important.

Besides, studies investigating PTSS in relation to self-esteem are usually done within populations that have experienced the same type of trauma, like earthquakes (Chung et al., 2002; Liu et al., 2018; Zhou et al., 2017) or partner violence (Cascardi & O'Leary, 1992). Research on trauma types suggest that an important distinction to be made is whether the experienced trauma is interpersonal or non-interpersonal in nature. Interpersonal trauma is defined as emotional abuse, emotional neglect, physical abuse, physical neglect, and sexual abuse. These types of abuse and neglect are often perpetrated by someone close to the victim (Mueser et al., 2004; Nishith et al., 2000; Pelcovitz et al., 1997). Non-interpersonal traumas are events like natural disasters, illness, accidents, or combat-related trauma. While both types of traumas can be experienced as horrific and extremely stressful, those who experienced interpersonal trauma show higher PTSS and PTSD severity across all symptom clusters in contrast to those who experienced non-interpersonal trauma

(Forbes et al., 2013; Mauritz et al., 2013; Thomas et al., 2021). The impact of interpersonal trauma can be seen in other domains of life as well, for example adults who experienced childhood maltreatment or childhood sexual abuse are more likely to experience long-term health consequences and poor overall functioning compared to both healthy and different traumatized populations (Golding, 1999; Irish et al., 2009; López-Martinez et al., 2016; Molnar et al., 2001). It comes as no surprise that lower rates of self-esteem are consistently found in those who experienced interpersonal trauma (Cascardi & O’Leary, 1992; Kim & Cicchetti, 2006). Likewise, a systematic review by Kouvelis and Kangas (2021) showed how self-identity, a concept close to self-esteem, is especially negatively impacted across the life span after interpersonal trauma. Reiland and Clark’s (2017) findings suggest the events experienced in interpersonal trauma cause feelings of betrayal and shame that are more central to a person’s identity than when non-interpersonal trauma is experienced. Especially the feelings of shame about what happened could influence self-esteem as it can lead to self-blame. When it comes to non-interpersonal trauma, lower rates of self-esteem are found as well, but they are more frequently found when in combination with other factors such as low social support and/or the experience of more negative life events (Adams & Boscarino, 2006; Tang et al., 2020; Zhou et al., 2017). Self-esteem might explain why PTSS tends to be more severe in interpersonal trauma in comparison to non-interpersonal trauma. It would also be interesting to observe whether a difference in self-esteem can be seen between trauma types in a non-clinical sample as well.

To date, no research has examined how the type of trauma relates to post-traumatic stress symptoms and self-esteem in a non-clinical sample. The current study is aimed to further explore this relationship by using data from an existing study in a Dutch student sample. Available research points towards the idea that low self-esteem and high PTSS occur together, and this association could be explained by trauma type. Therefore, this study hypothesizes that *self-esteem mediates the relationship between trauma type and PTSS*. It is also hypothesized *this mediation is partial* because

self-esteem will not completely explain the relationship between trauma type and PTSS, as more factors outside the scope of this study that are already established (for a more in depth look on this relationship, see Reiland & Clark, 2017).

Method

Participants and procedure

In this study, available data from Boelen and Lenferink's (2018) ongoing study "Omgaan met Onzekerheid" was used. This is a longitudinal study consisting out of three cohorts, where participants answered questionnaires at one moment as a baseline (wave 1), and after six months as a follow-up (wave 2). For this study, data from wave 1 of the third cohort was used, making this study cross-sectional in nature. Participants were recruited via a website from the faculty of Social Sciences at Utrecht University, the Netherlands where bachelor students could register themselves as test subjects. After opening the link to the online questionnaire via Qualtrics, participants had to complete an informed consent form where voluntary participation and anonymity were emphasized.

All participants were university students enrolled in the psychology bachelor at Utrecht University and were offered course credits for their participation and no other incentive was offered to enter. Out of 493 participants, 35 were excluded due to not giving informed consent, then 24 were excluded due to not fully finishing all questionnaires. After that, 33 more participants were excluded due to not having a traumatic memory and therefore not completing the post-traumatic stress disorder checklist for DSM-5. Finally, 10 participants were excluded because of not answering what the most impactful event in their life was on the Life Event Checklist for DSM-5 questionnaire. A total of 391 participants fully completed the required questionnaires and corresponding questions for this study. The majority of participants were female (78.3%), with a mean age of 22 ($SD=3.36$) years, ranging from 18 to 58 years old.

Materials

Posttraumatic Stress Symptoms

Posttraumatic stress symptoms were measured with the Dutch version (Boeschoten et al., 2014) of the post-traumatic stress disorder checklist for DSM-5, PCL-5 in short (Weathers et al., 2013). This is a self-report questionnaire consisting out of 20 questions, with questions like: “In the past month, how much were you bothered by: repeated, disturbing, and unwanted memories of the stressful experience?”. Responses were given on a 5-point Likert scale ranging from 0 (Not at all) to 4 (Extremely). The total of the score was calculated by summing up all items, with higher scores indicating higher levels of PTSS. Scores range from 0 to 80, with a score above 31 indicating there are significant amount of PTSS present (Ashbaugh et al., 2016). The PCL-5 had an excellent level of internal consistency in this sample, as Cronbach’s α in this sample was 0.94.

Self-esteem

The Dutch version (Franck et al., 2008) of the 10-item Rosenberg Self-esteem scale (R-SES) was used to measure global self-esteem (Rosenberg et al., 1995), with questions like “I am able to do things as well as most other people” or “I certainly feel useless at times”. Responses were given on a 4-point Likert scale ranging from 1 (Strongly disagree) to 4 (Strongly agree). The total of the score was calculated by reverse scoring five items and adding these to the score of the other five items. The score could range from 10 to 40, with a higher score indicating a higher level of self-esteem. The R-SES had a good level of internal consistency, as Cronbach’s α in this sample was 0.90.

Experience of interpersonal or non-interpersonal trauma

The Dutch version of the 17-item Life Event Checklist for DSM-5, LEC-5 in short, was used to screen for potentially traumatic events in a participant’s lifetime, such as a natural disaster or an assault (Garnefski & Kraaij, 2001; Gray et al., 2004). Participants indicated in which way they were confronted with an event: if it happened to them personally, witnessed it, learned about it, or whether it was a part of their job. They could also indicate if they were not sure. At the end of this

questionnaire, participants indicated what they considered the most impactful event, in what way they were confronted with this and how long ago this happened.

The answer to the most impactful event is seen as most related to their posttraumatic stress symptoms score. Based on this question, two groups were created. For the interpersonal trauma type, the participant had to respond to this question with an event in line with physical abuse, physical neglect, emotional abuse, emotional neglect, or sexual abuse which they had to experience personally. When it comes to the non-interpersonal trauma type, participants in this study were exposed to a variety of negative life events, but not all events would be diagnosed as traumatic per DSM-5. Because there is some evidence supporting the idea that negative life events that give a lot of stress can give rise to PTSS (Mol et al., 2005), all negative events experienced will be included in the non-interpersonal trauma group. The interpersonal trauma group was coded as 1 and non-interpersonal trauma was coded as 0. Table 1 shows the distribution of age and gender of the sample as a whole and per trauma type.

Table 1

Descriptive statistics of demographics total sample and per trauma type

Measure	Total	Interpersonal	Non-interpersonal
<i>Gender</i>			
<i>n</i>	391	52	339
% Male	21.5	9.6	23.3
% Female	78.3	90.4	76.4
% Other	0.3	-	0.3
<i>Age</i>			
<i>n</i>	391	52	339
<i>Mean</i>	22	22	22
<i>SD</i>	3.36	2.09	3.52

Statistical Analysis

First, the descriptive statistics and correlations for this sample will be discussed. Afterwards, this study explores whether mediation by self-esteem is present by using the PROCESS method by Hayes and Hall (2022). In this method, there are four conditions that must be met to decide if there is significant mediation present. Each condition is a simple regression analysis of all pathways shown in Figure 1.

The first condition to be met is that the direct relationship between the independent variable and the dependent variable needs to be significant. The direct relationship is the effect the independent variable has on the dependent variable, absent of the mediator and can be seen in Figure 1 as path *c*. Secondly, that the independent variable must be significantly correlated with the mediator, this can be seen as path *a*. Subsequently, the pathway between the mediator and the dependent variable must be significant as well to meet the third condition (path *b*).

If the relationships in the first three steps are significant, the mediator can be added into the regression model. Then the indirect relationship is determined, which is the effect of the independent variable on the dependent variable, through the mediator. This indirect relationship can be seen in Figure 1 as *ab* or path *c'*.

The form which this mediation effect takes, depends on whether the independent variable is no longer significant when controlling for the mediator. In that case, the findings support full mediation. If both the independent variable and the mediator significantly predict the dependent variable, the findings support partial mediation.

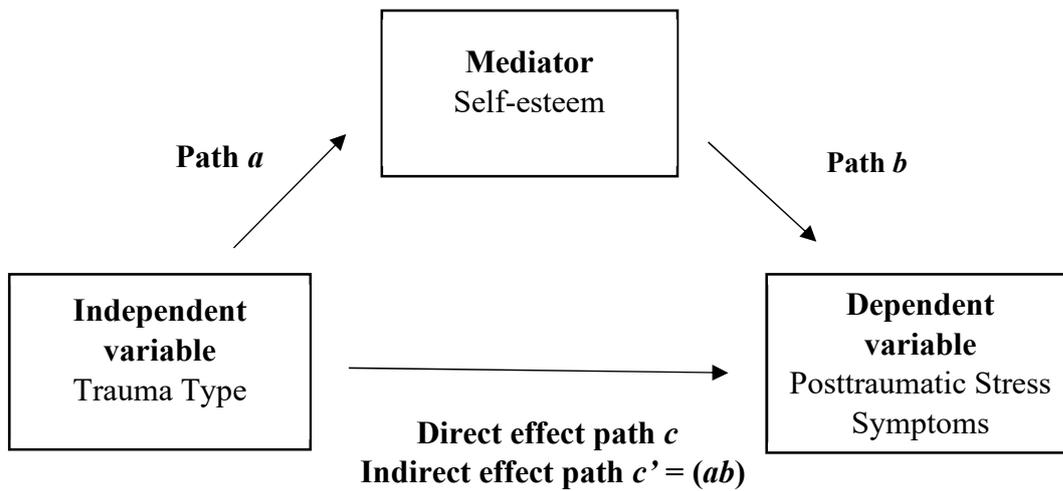
Finally, the Sobel test will be used to determine whether a significant mediation effect is found. When $-1.96 < z < 1.96$, it can be concluded that the effect is larger than it would be expected by chance. This would mean the predictor significantly affects the outcome variable through the mediator.

To test the robustness of the following results, the model is run again with controlling

variables: age, gender, years since trauma and relationship status.

Figure 1

Hypothesized regression pathways



Results

Descriptive and preliminary analyses

Means, standard deviations and score ranges for questionnaires PCL-5 and R-SES are shown in Table 2 as well as correlations. Correlation showed that posttraumatic stress symptoms and self-esteem were moderately negatively correlated in all participants, with correlation being stronger in the interpersonal trauma group. The variable years since trauma was only significantly correlated with PTSS in the non-interpersonal group, but only a weak negative association was found.

The interpersonal trauma group consisted out of 52 participants, where the most impactful events reported were sexual abuse (63.5%), domestic abuse (21.2%), emotional abuse (5.8%), physical abuse (3.8%), attempted sexual abuse (3.8%), and emotional neglect (1.9%). The non-interpersonal trauma group consisted out of 339 participants, where the impactful events most often reported were the death of a loved one (26.1%), a loved one being sick (14.7%), hearing about the

traumatic experiences of a close one (14.7%), the suicide of a loved one (10%), being part of a traffic accident (7.9%), problems at home (6.1%). Less frequent reported impactful events were being witness of a crime, one time assault by a stranger, and relationship problems.

It should be noted that for the PCL-5, 9.4% of the non-interpersonal trauma group scored the same or higher than the cut-off score of 31. For the interpersonal trauma group, 38.5% of participants had a score that indicated significant PTSS. In the total sample, 13.3% of participants scored the same or higher than the cut-off score.

Table 2

Descriptive statistics and Pearson correlation coefficients

Measure	<i>n</i>	<i>M</i>	<i>SD</i>	Range	1	2	3
<i>All participants</i>	391						
1. PTSS	391	12.8	14.4	0-73	-		
2. Self-esteem	391	30.7	5.5	11-40	-.45*	-	
3. Years since trauma	385	5.1	4.5	0-23	-.13	.06	-
<i>Interpersonal trauma</i>	52						
1. PTSS	52	25.4**	18.0	0-73	-		
2. Self-esteem	52	27.6**	6.9	11-40	-.57*	-	
3. Years since trauma	52	5.2	4.0	0-15	-0.06	0.10	-
<i>Non-interpersonal trauma</i>	339						
1. PTSS	339	10.9**	12.7	0-57	-		
2. Self-esteem	339	31.1**	5.1	16-40	-.36*	-	
3. Years since trauma	339	5.0	4.5	0-23	-.16*	.06	-

Note * $P < 0.01$

**Significant difference in means between trauma groups after t-test

Self-esteem as a mediator

This sample meets necessary assumptions for a regression analysis to be performed: linearity, normality, uncorrelatedness, no multicollinearity and homoscedasticity. The results showed that trauma type negatively predicted posttraumatic stress symptoms with the total effect being $b = -14.56$, 95% CI [-10.60, 18.51], $t = -7.23$ with $p < 0.001$, in the total effect there is no regard for mediation as it is the sum of the direct and indirect effect. Thus, the total effect showed that PTSS does differ

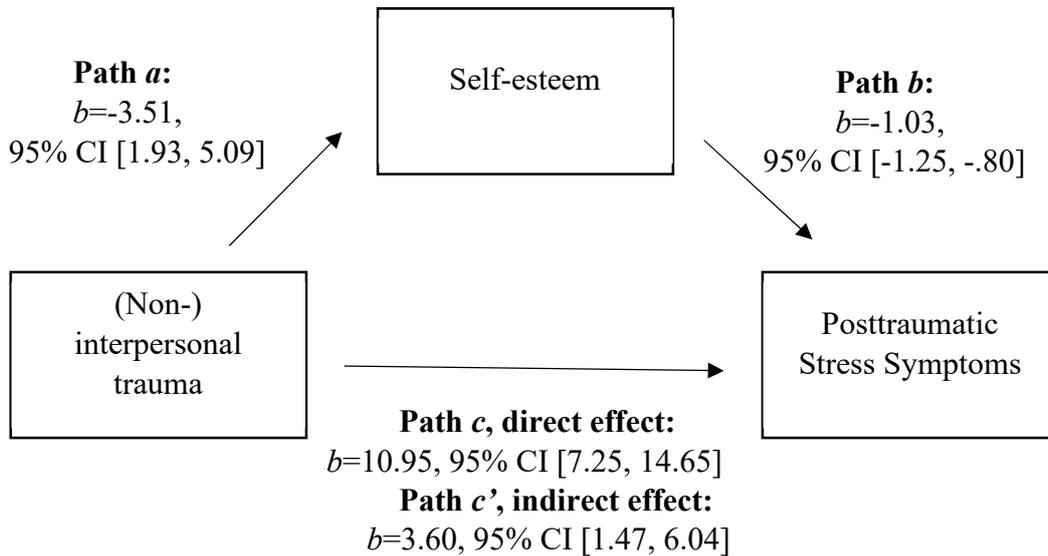
significantly between trauma types, whether self-esteem is considered or not. To determine whether mediation is present, a series of regression analyses were carried out to see if all conditions for mediation are present.

The first condition was met, as trauma type significantly predicted posttraumatic stress symptoms without considering self-esteem, as seen in path *c* in Figure 2. This means there was a direct effect of both trauma types on PTSS, in absence of self-esteem. Here the unstandardized coefficient is positive, meaning when the trauma type is interpersonal, PTSS went up more compared to the non-interpersonal trauma group. The second condition was met as well, as trauma type significantly predicted self-esteem, seen in Figure 2 as path *a*. Trauma type explained 4.7% of the variance in self-esteem. The unstandardized coefficient is negative, which means when the trauma type is interpersonal, self-esteem decreases more in comparison to the non-interpersonal trauma group. In turn, path *b* was significant as well, as self-esteem was related to PTSS. The unstandardized coefficient again being negative, meaning when self-esteem goes up, PTSS goes down and vice versa. Because the former conditions were met, self-esteem can be added as a mediator to the regression model. The indirect relationship between trauma type and posttraumatic stress symptoms through self-esteem is significant, as seen in Figure 2 as *ab* or path *c'*. Through this model 26.7% of the variance in trauma type can be explained. The found mediation was partial, as the relationship between trauma type and PTSS diminished but did not disappear as self-esteem was introduced to the model. Another measure of mediation is the proportion of the effect mediated, *ab/c* in other words, which also suggests the mediation found is partial at 0.25. Full mediation would have been found when the proportion of the effect mediated was 0.8.

Finally, the Sobel test showed that the mediation as whole is statistically significant with $z=3.50$ with $p<0.001$. Controlling for the variables age, gender, relationship status and years since trauma did not yield substantial findings and did not change any conclusions regarding the found mediation effect.

Figure 2

Associations of the mediation model between self-esteem, (non-)interpersonal trauma, and PTSS



Discussion

This study was conducted to examine the impact trauma type has on posttraumatic stress symptoms and if this relationship could be mediated by self-esteem. Results were in line with the hypothesis and show that when interpersonal trauma is experienced, higher rates of PTSS, and lower rates of self-esteem are reported in comparison to when non-interpersonal trauma is experienced. After a series of regression analyses, it was found that when self-esteem is added to the model as a mediator, the relationship between trauma type and PTSS can be explained partially where none of the control (age, gender, years since trauma, and relationship status) variables yielded a significant difference.

Self-esteem playing a mediating role between trauma type and PTSS is consistent with the hypothesis and aligns with other research that explores the role of self-esteem within PTSS and PTSD. The results also confirmed the hypothesis that self-esteem is a stronger mediator for the interpersonal trauma group. This is one of the first studies to include both trauma types, as others often investigate PTSS and self-esteem within one trauma type. In both interpersonal trauma such as

domestic abuse and childhood maltreatment (Bradley et al., 2005) and non-interpersonal trauma such as earthquakes (Zhou et al., 2017), it is found that self-esteem mediates PTSS too. It is important to make the distinction between trauma types in this area of research, as interpersonal trauma often involves traumatic events happening multiple times, while non-interpersonal trauma is usually about a singular event. Therefore, self-esteem might function differently in between the two trauma groups. As is shown by Zhou et al. (2017), low self-esteem in non-interpersonal trauma only comes into play when low social support is found. This seems to be the case in other research involving non-interpersonal trauma and self-esteem (Salami, 2010; Weinberg, 2013). For this reason, future research should consider social support as well. This study tried to do so with controlling for relationship status, but no significant evidence was found. Perhaps if a more robust form of social support was integrated, such as a social support and satisfaction questionnaire, this could have been added to the model and perhaps a more outspoken difference in self-esteem between the two trauma groups could have been found. Theoretically, self-esteem can be obtained from the positive evaluations and support from others, which may help the affected individual to be confident in their ability to overcome hardships (Smith & Petty, 1995). The lack of a more robust measure of social support in this model can be seen as one of the most important limitations of this study, as romantic relationships usually do not provide all forms of social support (for a more detailed discussion, see Glanz et al., 2008).

The mediating role of self-esteem was found to be partial, which is also in line with the hypothesis. Full mediation would mean trauma type causes PTSS only because of self-esteem, which was not likely to be the case since there are many other variables that are already well researched that influence the relationship between trauma type and PTSS. As mentioned above, one of these could be social support. Other variables have to do with the traumatic event itself, such as the severity (Brewin et al., 2000), or personality traits such as neuroticism (Cox et al., 2004; Yin et al., 2019).

When it comes to the difference in PTSS scores between trauma type groups, these findings

align with what is found in clinical populations of trauma (Forbes et al., 2013; Mauritz et al., 2013; Thomas et al., 2021), mainly that those who experienced interpersonal trauma report more PTSS compared to those who experienced non-interpersonal trauma. What is interesting to see in this study, is that in the non-interpersonal trauma group the variable 'years since trauma' did significantly and negatively correlate with PTSS while in the interpersonal trauma group it did not. It seems that an increase in the number of years since the trauma has passed affects PTSS positively in the non-interpersonal trauma group only. Even though the found relationship is small, this can be explained by Reiland and Clark's (2017) hypothesis about how the influence of interpersonal trauma is more central to a person's identity and thus may take more time to overcome. The implication of this finding is that in non-interpersonal trauma, PTSS does decrease over time, while in interpersonal trauma more than just time is needed to decrease PTSS and perhaps further counselling is needed.

The results also show that PTSS is negatively associated with self-esteem in both trauma types, which is in line with previous research. For example, this association is found in non-interpersonal trauma groups like veterans (Kashdan et al., 2006b) or earthquake survivors (Liu et al., 2018; Zhou et al., 2017) and interpersonal trauma groups like victims of domestic violence and childhood maltreatment (Bradley et al., 2005). This association can also be found in non-clinical samples, for example Fasciano et al. (2020) where cumulative maltreatment, a concept close to interpersonal trauma, negatively correlated with self-esteem and positively with PTSS in a college student sample. Or Chung et al. (2002), who measured self-esteem and PTSS after the dissolution of a dating relationship, which would be categorised as non-interpersonal trauma. Here, low self-esteem predicted PTSS as well. Clearly, this association can be found in all trauma types, clinical and non-clinical populations. This study extends what is previously known by showing the strength of this relationship is different between the two trauma types, with PTSS and self-esteem associating strongly in interpersonal trauma compared to non-interpersonal trauma, where a moderate association was found. This result can again be explained by how interpersonal trauma tends to be

more pervasive in the life compared to non-interpersonal trauma, because repeated emotional or physical neglect, assault, or even sexual abuse often happens behind closed doors. This makes it difficult to talk about or get help, therefore causing feelings of shame which become central to a person's identity (Reiland & Clark, 2017).

While low self-esteem is often found to relate to PTSS, a longitudinal study by Kashdan et al. (2006b) focused more on the instability of self-esteem over time rather than one measurement at one moment in time. Here it was found that the rates of self-esteem of veterans who did have PTSD (compared to veterans without PTSD) differed mainly in how stable their self-esteem levels were over time. It might be more interesting for future research to see how self-esteem fluctuates over time in a non-clinical sample, as it might function as a warning sign one will develop PTSD. Thus, the relationship to PTSS might be even more strong than self-esteem. Especially since a review by Kernis (2005) about self-esteem and its stability states that stability of self-esteem has a better predictive value for any type of psychological functioning, since the magnitude of short-term fluctuations people experience says more about their well-being than only a snapshot of self-esteem at one moment in time. For future research, a longitudinal design is recommended where self-esteem stability is used as it might paint a more comprehensive picture of exactly how self-esteem functions when PTSS are experienced.

There are some limitations to be considered when interpreting these results. The first being that a homogeneous sample is used in terms of age, gender, and education level. This study did control for gender as well as age and found to significant results, but due to the lack of a broad range in terms of these demographics the effects could not be analysed very well. While women did overrepresent the interpersonal trauma group, this is in line with how women are more likely than men to experience sexual assault and other forms of interpersonal trauma (Abrahams et al., 2014; Morrison et al., 2007). Coincidentally, the interpersonal trauma group also consisted largely out of women who had experienced sexual abuse. The results could also have been biased because women

tend to have lower self-esteem (McMullin & Cairney, 2004). All things considered, a broader age range and a more even distribution of genders in future research will make these results more robust and make these results more generalizable to the general public. Since this study used university students, the homogeneity in education level greatly influences the generalizability of these results. It has been well established that low education level is a predictor for developing PTSD (Breslau et al., 2013; Ssenyonga et al., 2013), but the reason why remains unclear. The hypothesis is that those with a lower education level have a lower capacity to place traumatic experiences into more meaningful concepts and therefore will struggle more with PTSS (Gilbertson et al., 2006). However, it is not likely this study would have found different results if more education levels were included, but it would make the results even more generalizable.

The last limitation to consider in this study is that it is cross-sectional. While an estimate can be given of the effect size one variable has on the other, nothing can be said about the temporal order. It was assumed a certain trauma type influences self-esteem and PTSS, but the height of self-esteem beforehand remains unknown, so it is difficult to derive a causal relationship from this analysis. This is especially important since some research supports the idea that having PTSS lowers self-esteem (Adams & Boscarino, 2006). In this area of research, randomization trials to study causality are hard to employ. Future research can only give a close estimate through longitudinal designs.

Despite these limitations, there are important implications that emerge from this study. It was already established that high self-esteem functions as a protective factor for different types of psychiatric problems, such as depression or anxiety (Agaibi & Wilson, 2005; Rossi et al., 2020). This study implicates that low self-esteem might worsen PTSS. To fully establish this, a clear picture about how exactly PTSS influences self-esteem must be made. Either way, self-esteem enhancement trainings could be beneficial for everyone. For those that have experienced trauma and for those who have not. In the latter group, such trainings might function as preventative for developing long term

PTSS when they do experience trauma. For the former, such trainings could decrease the remaining PTSS. Furthermore, this study also emphasises the importance of self-esteem in interpersonal trauma. This type of trauma often has some taboo surrounding it, making it hard for victims to talk about. For these people, self-esteem enhancement would be especially beneficial. Organisations that help victims of trauma could also use this knowledge to improve their counselling.

All in all, this study confirms previous research on self-esteem being a mediator in the relationship between trauma type and PTSS. This study extends this knowledge by comparing interpersonal and non-interpersonal trauma and finding that in each trauma group, self-esteem and PTSS are negatively related to one another, but this association is stronger when interpersonal trauma is experienced. Low self-esteem as a mediator gives a partial explanation to why this association is stronger in interpersonal trauma. These results emphasise the idea that the effects of interpersonal trauma are more detrimental than those of non-interpersonal trauma but acknowledge that improvement of self-esteem could be beneficial for both trauma types and should be investigated more closely.

References

- Abrahams, N., Devries, K., Watts, C., Pallitto, C., Petzold, M., Shamu, S., & García-Moreno, C. (2014). Worldwide prevalence of non-partner sexual violence: a systematic review. *The Lancet*, 383(9929), 1648–1654. [https://doi.org/10.1016/s0140-6736\(13\)62243-6](https://doi.org/10.1016/s0140-6736(13)62243-6)
- Adams, R. E., & Boscarino, J. A. (2006). Predictors of PTSD and Delayed PTSD After Disaster. *Journal of Nervous & Mental Disease*, 194(7), 485–493. <https://doi.org/10.1097/01.nmd.0000228503.95503.e9>
- Agaibi, C. E., & Wilson, J. P. (2005). Trauma, PTSD, and Resilience. *Trauma, Violence, & Abuse*, 6(3), 195–216. <https://doi.org/10.1177/1524838005277438>
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition: DSM-5* (5de editie). American Psychiatric Publishing.
- Ashbaugh, A. R., Houle-Johnson, S., Herbert, C., El-Hage, W., & Brunet, A. (2016). Psychometric Validation of the English and French Versions of the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5). *PLOS ONE*, 11(10), e0161645. <https://doi.org/10.1371/journal.pone.0161645>
- Atwoli, L., Stein, D. J., Koenen, K. C., & McLaughlin, K. A. (2015). Epidemiology of posttraumatic stress disorder. *Current Opinion in Psychiatry*, 28(4), 307–311. <https://doi.org/10.1097/ycp.0000000000000167>
- Benjet, C., Bromet, E., Karam, E. G., Kessler, R. C., McLaughlin, K. A., Ruscio, A. M., Shahly, V., Stein, D. J., Petukhova, M., Hill, E., Alonso, J., Atwoli, L., Bunting, B., Bruffaerts, R., Caldas-de-Almeida, J. M., De Girolamo, G., Florescu, S., Gureje, O., Huang, Y., . . . Koenen, K. C. (2015). The epidemiology of traumatic event exposure worldwide: results from the World Mental Health Survey Consortium. *Psychological Medicine*, 46(2), 327–343. <https://doi.org/10.1017/s0033291715001981>

- Boelen, P. A., & Lenferink, L. I. (2018). Latent class analysis of indicators of intolerance of uncertainty. *Scandinavian Journal of Psychology, 59*(3), 243–251.
<https://doi.org/10.1111/sjop.12440>
- Boeschoten, M. A., Bakker, A., Jongedijk, R. A., & Olf, M. (2014). Life Events Checklists for DSM-5 (LEC-5) Dutch version. *Diemen, The Netherlands: Arq Psychotrauma Expert Groep*.
- Bomyea, J., Risbrough, V., & Lang, A. J. (2012a). A consideration of select pre-trauma factors as key vulnerabilities in PTSD. *Clinical Psychology Review, 32*(7), 630–641.
<https://doi.org/10.1016/j.cpr.2012.06.008>
- Bradley, R., Schwartz, A. C., & Kaslow, N. J. (2005). Posttraumatic stress disorder symptoms among low-income, African American women with a history of intimate partner violence and suicidal behaviors: Self-esteem, social support, and religious coping. *Journal of Traumatic Stress, 18*(6), 685–696. <https://doi.org/10.1002/jts.20077>
- Breslau, N., Chen, Q., & Luo, Z. (2013). The Role of Intelligence in Posttraumatic Stress Disorder: Does it Vary by Trauma Severity? *PLoS ONE, 8*(6), e65391.
<https://doi.org/10.1371/journal.pone.0065391>
- Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68*(5), 748–766. <https://doi.org/10.1037/0022-006x.68.5.748>
- Bryant, R. A., Creamer, M., O'Donnell, M., Forbes, D., McFarlane, A. C., Silove, D., & Hadzi-Pavlovic, D. (2017). Acute and Chronic Posttraumatic Stress Symptoms in the Emergence of Posttraumatic Stress Disorder. *JAMA Psychiatry, 74*(2), 135.
<https://doi.org/10.1001/jamapsychiatry.2016.3470>
- Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. Cambridge: Cambridge University Press.

- Cascardi, M., & O'Leary, K. D. (1992). Depressive symptomatology, self-esteem, and self-blame in battered women. *Journal of Family Violence, 7*(4), 249–259.
<https://doi.org/10.1007/bf00994617>
- Chung, M. C., Farmer, S., Grant, K., Newton, R., Payne, S., Perry, M., Saunders, J., Smith, C., & Stone, N. (2002). Self-esteem, personality and post traumatic stress symptoms following the dissolution of a dating relationship. *Stress and Health, 18*(2), 83–90.
<https://doi.org/10.1002/smi.929>
- Cox, B. J., MacPherson, P. S., Enns, M. W., & McWilliams, L. A. (2004). Neuroticism and self-criticism associated with posttraumatic stress disorder in a nationally representative sample. *Behaviour Research and Therapy, 42*(1), 105–114. [https://doi.org/10.1016/s0005-7967\(03\)00105-0](https://doi.org/10.1016/s0005-7967(03)00105-0)
- De Vries, G. J., & Olf, M. (2009). The lifetime prevalence of traumatic events and posttraumatic stress disorder in the Netherlands. *Journal of Traumatic Stress, 22*(4), 259–267.
<https://doi.org/10.1002/jts.20429>
- Diagnostic and Statistical Manual of Mental Disorders: DSM-5 (5th edition). (2014). *Reference Reviews, 28*(3), 36–37. <https://doi.org/10.1108/rr-10-2013-0256>
- Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy, 38*(4), 319–345. [https://doi.org/10.1016/s0005-7967\(99\)00123-0](https://doi.org/10.1016/s0005-7967(99)00123-0)
- Elwood, L. S., Hahn, K. S., Olatunji, B. O., & Williams, N. L. (2009b). Cognitive vulnerabilities to the development of PTSD: A review of four vulnerabilities and the proposal of an integrative vulnerability model. *Clinical Psychology Review, 29*(1), 87–100.
<https://doi.org/10.1016/j.cpr.2008.10.002>
- Fasciano, L. C., Dale, L. P., Shaikh, S. K., Little Hodge, A. L., Gracia, B., Majdick, J. M., Holder, A. Y., & Ford, J. D. (2020). Relationship of childhood maltreatment, exercise, and emotion regulation to self-esteem, PTSD, and depression symptoms among college students. *Journal*

of American College Health, 69(6), 653–659.

<https://doi.org/10.1080/07448481.2019.1705837>

Forbes, D., Lockwood, E., Phelps, A., Wade, D., Creamer, M., Bryant, R. A., McFarlane, A., Silove, D., Rees, S., Chapman, C., Slade, T., Mills, K., Teesson, M., & O'Donnell, M. (2013).

Trauma at the Hands of Another. *The Journal of Clinical Psychiatry*, 75(02), 147–153.

<https://doi.org/10.4088/jcp.13m08374>

Franck, E., De Raedt, R., Barbez, C., & Rosseel, Y. (2008). Psychometric Properties of the Dutch

Rosenberg Self-Esteem Scale. *Psychologica Belgica*, 48(1), 25. <https://doi.org/10.5334/pb-48-1-25>

Garnefski, N., & Kraaij, V. (2001). Life Event Checklist (LEC-5). *Leiden Universiteit*.

Gilbertson, M. W., Paulus, L. A., Williston, S. K., Gurvits, T. V., Lasko, N. B., Pitman, R. K., &

Orr, S. P. (2006). Neurocognitive function in monozygotic twins discordant for combat exposure: Relationship to posttraumatic stress disorder. *Journal of Abnormal Psychology*, 115(3), 484–495. <https://doi.org/10.1037/0021-843x.115.3.484>

Glanz, K., Rimer, B. K., & Viswanath, K. (2008). *Health Behavior and Health Education* (4de editie). Wiley.

Golding, J. M. (1999). Intimate partner violence as a risk factor for mental disorders: A meta-analysis. *Journal of family violence*, 14(2), 99–132.

Gray, M. J., Litz, B. T., Hsu, J. L., & Lombardo, T. W. (2004). Psychometric Properties of the Life Events Checklist. *Assessment*, 11(4), 330–341. <https://doi.org/10.1177/1073191104269954>

Greenberg, J., Solomon, S., Pyszczynski, T., Rosenblatt, A., Burling, J., Lyon, D., Simon, L., & Pinel, E. (1992). Why do people need self-esteem? Converging evidence that self-esteem serves an anxiety-buffering function. *Journal of Personality and Social Psychology*, 63(6), 913–922. <https://doi.org/10.1037/0022-3514.63.6.913>

- Hayes, A. F., & Hall, M. (2022). *Introduction to Mediation, Moderation, and Conditional Process Analysis* (3rd edition). Guilford Publications.
- Irish, L., Kobayashi, I., & Delahanty, D. L. (2009). Long-term Physical Health Consequences of Childhood Sexual Abuse: A Meta-Analytic Review. *Journal of Pediatric Psychology, 35*(5), 450–461. <https://doi.org/10.1093/jpepsy/jsp118>
- Kashdan, T. B., Barrios, V., Forsyth, J. P., & Steger, M. F. (2006a). Experiential avoidance as a generalized psychological vulnerability: Comparisons with coping and emotion regulation strategies. *Behaviour Research and Therapy, 44*(9), 1301–1320. <https://doi.org/10.1016/j.brat.2005.10.003>
- Kashdan, T. B., Uswatte, G., Steger, M. F., & Julian, T. (2006b). Fragile self-esteem and affective instability in posttraumatic stress disorder. *Behaviour Research and Therapy, 44*(11), 1609–1619. <https://doi.org/10.1016/j.brat.2005.12.003>
- Kernis, M. H. (2005). Measuring Self-Esteem in Context: The Importance of Stability of Self-Esteem in Psychological Functioning. *Journal of Personality, 73*(6), 1569–1605. <https://doi.org/10.1111/j.1467-6494.2005.00359.x>
- Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, Severity, and Comorbidity of 12-Month DSM-IV Disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*(6), 617. <https://doi.org/10.1001/archpsyc.62.6.617>
- Kim, J., & Cicchetti, D. (2006). Longitudinal Trajectories of Self-System Processes and Depressive Symptoms Among Maltreated and Nonmaltreated Children. *Child Development, 77*(3), 624–639. <https://doi.org/10.1111/j.1467-8624.2006.00894.x>
- Kouvelis, G., & Kangas, M. (2021). Evaluating the association between interpersonal trauma and self-identity: A systematic review. *Traumatology, 27*(2), 118–148. <https://doi.org/10.1037/trm0000325>

- Leskin, L. P., & White, P. M. (2007). Attentional networks reveal executive function deficits in posttraumatic stress disorder. *Neuropsychology, 21*(3), 275–284.
<https://doi.org/10.1037/0894-4105.21.3.275>
- Liu, Q., Jiang, M., Yang, Y., Zhou, H., Zhou, Y., Yang, M., Xu, H., & Ji, Y. (2018). Prevalence of Posttraumatic Stress Disorder (PTSD) and Its Correlates Among Junior High School Students at 53 Months After Experiencing an Earthquake. *Disaster Medicine and Public Health Preparedness, 13*(03), 414–418. <https://doi.org/10.1017/dmp.2018.76>
- López-Martínez, A. E., Serrano-Ibáñez, E. R., Ruiz-Párraga, G. T., Gómez-Pérez, L., Ramírez-Maestre, C., & Esteve, R. (2016). Physical Health Consequences of Interpersonal Trauma: A Systematic Review of the Role of Psychological Variables. *Trauma, Violence, & Abuse, 19*(3), 305–322. <https://doi.org/10.1177/1524838016659488>
- Mann, M. M., Hosman, C. M., Schaalma, H. P., & De Vries, N. K. (2004). Self-esteem in a broad-spectrum approach for mental health promotion. *Health education research, 19*(4), 357–372.
- Mauritz, M. W., Goossens, P. J. J., Draijer, N., & Van Achterberg, T. (2013). Prevalence of interpersonal trauma exposure and trauma-related disorders in severe mental illness. *European Journal of Psychotraumatology, 4*(1), 19985.
<https://doi.org/10.3402/ejpt.v4i0.19985>
- McMullin, J. A., & Cairney, J. (2004). Self-esteem and the intersection of age, class, and gender. *Journal of Aging Studies, 18*(1), 75–90. <https://doi.org/10.1016/j.jaging.2003.09.006>
- Mol, S. S. L., Arntz, A., Metsemakers, J. F. M., Dinant, G. J., Vilters-van Montfort, P. A. P., & Knottnerus, J. A. (2005). Symptoms of post-traumatic stress disorder after non-traumatic events: evidence from an open population study. *British Journal of Psychiatry, 186*(6), 494–499. <https://doi.org/10.1192/bjp.186.6.494>

- Molnar, B. E., Buka, S. L., & Kessler, R. C. (2001). Child sexual abuse and subsequent psychopathology: results from the National Comorbidity Survey. *American Journal of Public Health, 91*(5), 753–760. <https://doi.org/10.2105/ajph.91.5.753>
- Morrison, A., Ellsberg, M., & Bott, S. (2007). Addressing Gender-Based Violence: A Critical Review of Interventions. *The World Bank Research Observer, 22*(1), 25–51. <https://doi.org/10.1093/wbro/lkm003>
- Mueser, K. T., Salyers, M. P., Rosenberg, S. D., Goodman, L. A., Essock, S. M., Osher, F. C., Swartz, M. S., & Butterfield, M. I. (2004). Interpersonal Trauma and Posttraumatic Stress Disorder in Patients with Severe Mental Illness: Demographic, Clinical, and Health Correlates. *Schizophrenia Bulletin, 30*(1), 45–57. <https://doi.org/10.1093/oxfordjournals.schbul.a007067>
- Nishith, P., Mechanic, M. B., & Resick, P. A. (2000). Prior interpersonal trauma: The contribution to current PTSD symptoms in female rape victims. *Journal of Abnormal Psychology, 109*(1), 20–25. <https://doi.org/10.1037/0021-843x.109.1.20>
- Omasu, F., Hotta, Y., Watanabe, M., & Yoshioka, T. (2018). The Relationship between Post-Traumatic Stress Disorder and Self-Esteem along with the Importance of Support for Children. *Journal of Preventive Medicine, 8*(4).
- Pelcovitz, D., Van der Kolk, B., Roth, S., Mandel, F., Kaplan, S., & Resick, P. (1997). Development of a criteria set and a structured interview for disorders of extreme stress (SIDES). *Journal of traumatic Stress, 10*(1), 3–16.
- Pyszczynski, T., Greenberg, J., Solomon, S., Arndt, J., & Schimel, J. (2004). Why Do People Need Self-Esteem? A Theoretical and Empirical Review. *Psychological Bulletin, 130*(3), 435–468. <https://doi.org/10.1037/0033-2909.130.3.435>

- Reiland, S. A., & Clark, C. B. (2017). Relationship between event type and mental health outcomes: Event centrality as mediator. *Personality and Individual Differences, 114*, 155–159.
<https://doi.org/10.1016/j.paid.2017.04.009>
- Rosenberg, M. (1979). *Conceiving the self*. New York: Basic Books. New York: Basic Books.
- Rosenberg, M., Schooler, C., Schoenbach, C., & Rosenberg, F. (1995). Global Self-Esteem and Specific Self-Esteem: Different Concepts, Different Outcomes. *American Sociological Review, 60*(1), 141. <https://doi.org/10.2307/2096350>
- Rossi, A., Panzeri, A., Pietrabissa, G., Manzoni, G. M., Castelnuovo, G., & Mannarini, S. (2020). The Anxiety-Buffer Hypothesis in the Time of COVID-19: When Self-Esteem Protects from the Impact of Loneliness and Fear on Anxiety and Depression. *Frontiers in Psychology, 11*.
<https://doi.org/10.3389/fpsyg.2020.02177>
- Salami, S. O. (2010). Moderating Effects of Resilience, Self-Esteem, and Social Support on Adolescents' Reactions to Violence. *Asian Social Science, 6*(12).
<https://doi.org/10.5539/ass.v6n12p101>
- Silvern, L., Karyl, J., Waelde, L., Hodges, W. F., Starek, J., Heidt, E., & Min, K. (1995). Retrospective reports of parental partner abuse: Relationships to depression, trauma symptoms and self-esteem among college students. *Journal of Family Violence, 10*(2), 177–202. <https://doi.org/10.1007/bf02110599>
- Smith, S. M., & Petty, R. E. (1995). Personality moderators of mood congruency effects on cognition: The role of self-esteem and negative mood regulation. *Journal of Personality and Social Psychology, 68*(6), 1092–1107. <https://doi.org/10.1037/0022-3514.68.6.1092>
- Ssenyonga, J., Owens, V., & Olema, D. K. (2013). Posttraumatic Growth, Resilience, and Posttraumatic Stress Disorder (PTSD) among Refugees. *Procedia - Social and Behavioral Sciences, 82*, 144–148. <https://doi.org/10.1016/j.sbspro.2013.06.238>

- Tang, W., Wang, Y., Lu, L., Lu, Y., & Xu, J. (2020). Post-traumatic growth among 5195 adolescents at 8.5 years after exposure to the Wenchuan earthquake: Roles of post-traumatic stress disorder and self-esteem. *Journal of Health Psychology, 26*(13), 2450–2459. <https://doi.org/10.1177/1359105320913947>
- Thomas, E. A., Owens, G. P., & Keller, E. M. (2021). Relationships among non-interpersonal and interpersonal trauma types, posttraumatic stress, and posttraumatic growth. *Journal of Clinical Psychology, 77*(11), 2592–2608. <https://doi.org/10.1002/jclp.23190>
- Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). The PTSD checklist for DSM-5 (PCL-5). r PTSD at www.ptsd.va.gov, 10(4). *Scale available from the National Center for PTSD www.ptsd.va.gov, 10(4).*
- Weinberg, M. (2013). The Bidirectional Dyadic Association Between Tendency to Forgive, Self-Esteem, Social Support, and PTSD Symptoms Among Terror-Attack Survivors and Their Spouses. *Journal of Traumatic Stress, 26*(6), 744–752. <https://doi.org/10.1002/jts.21864>
- Yin, Q., Wu, L., Yu, X., & Liu, W. (2019). Neuroticism Predicts a Long-Term PTSD After Earthquake Trauma: The Moderating Effects of Personality. *Frontiers in Psychiatry, 10*. <https://doi.org/10.3389/fpsy.2019.00657>
- Zhou, X., Wu, X., & Zhen, R. (2017). Self-esteem and hope mediate the relations between social support and post-traumatic stress disorder and growth in adolescents following the Ya'an earthquake. *Anxiety, Stress, & Coping, 31*(1), 32–45. <https://doi.org/10.1080/10615806.2017.1374376>