



# **The Impact of Threat Appraisal in the Development of Post-Traumatic Stress Disorder**

*The Role of Threat to Life and Social Threat*

**Sóley Siggeirsdóttir**

Lokaverkefni til cand. psych. prófs í sálfræði

Sálfræðideild

Heilbrigðisvísindasvið



**HÁSKÓLI ÍSLANDS**

The Impact of Threat Appraisal in the Development of Post-Traumatic Stress Disorder: The Role of Threat to Life and Social Threat

Sóley Siggeirsdóttir

Leiðbeinandi: Andri Steinþór Björnsson, Edda Björk Þórðardóttir og Þórhildur Halldórsdóttir

Ritgerð þessi er lokaverkefni til cand. psych. prófs í klínískri sálfræði og er óheimilt að afrita ritgerðina nema með leyfi rétthafa.

© Sóley Siggeirsdóttir, Andri Steinþór Björnsson, Edda Björk Þórðardóttir og Þórhildur Halldórsdóttir, 2019

Prentun: Háskólaprent

Háskóli Íslands  
Heilbrigðisvísindasvið  
Sálfræðideild  
Vor 2019

## Table of Contents

Abstract.....	5
The Criterion A debate .....	6
Aversive social experiences, social anxiety disorder and PTSD.....	9
A new perspective on trauma .....	11
Trauma and psychopathology.....	12
Aims of the present study .....	13
Method.....	14
Participants .....	14
Measures.....	15
The Life Events Checklist for DSM-5 .....	15
The PTSD checklist for DSM-5.....	17
Patient Health Questionnaire .....	17
Generalized Anxiety Disorder-7 .....	18
The Mini International Neuropsychiatric.....	18
The Composite International Diagnostic Interview .....	19
Procedure.....	19
Statistical analyses.....	20
Results .....	21
Discussion.....	32
Strengths and limitations .....	37
Conclusions and Implications .....	38
References .....	40



## Abstract

There has been considerable controversy surrounding the stressor criterion in post-traumatic stress disorder (PTSD), specifically regarding the definition of what constitutes a traumatic stressor likely to lead to symptoms of PTSD. This study sought to examine the role of threat appraisal in relation to women's worst traumatic experiences and its association with PTSD in particular, but also with women's mental health in general. We propose that there exist at least two types of threat; *threat to life*, and *social threat*; the latter involving rejection and humiliation. The association between threat appraisal and psychopathology was examined in a large-scale epidemiological study on Icelandic women (N=8992). Results revealed that the experience of either primarily threat to life or primarily social threat in relation to women's worst traumatic experience has a strong association with PTSD symptoms. Furthermore, experiencing both types of threat was associated with a six-fold risk of having a probable PTSD diagnosis, compared to women who experienced neither type of threat. The experience of a social threat was specifically associated with an increased risk of having a probable social anxiety disorder (SAD) diagnosis, such that women in this group were two to three times as likely to have a probable diagnosis than women who experienced neither type of threat. Threat appraisal was also associated with symptoms of anxiety and depression. In conclusion, the results strongly suggest that shifting the focus away from the types of events that people experience and toward different types of threats is an essential step in advancing our understanding of trauma and the development of PTSD.

*Keywords:* Post-traumatic stress disorder, trauma, Criterion A debate, social threat, threat to life.

## **The Criterion A debate**

There has been a long-standing debate on what constitutes a traumatic stressor likely to lead to symptoms of post-traumatic stress disorder (PTSD). Unlike all other mental disorders, the diagnosis of PTSD rests on a core assumption of specific etiology (Rosen & Lilienfeld, 2008). In particular, it rests on the premise that a particular class of traumatic events, as defined by their objective characteristics, has a causal link to a distinct class of symptoms. These types of experiences are defined in the fifth and most recent version of the American Psychiatric Association's (APA) Diagnostic and statistical manual (DSM-5), as an "exposure to actual or threatened death, serious injury, or sexual violence" (Criterion A, APA, 2013, p. 271). Such events may be experienced by either direct exposure or indirect, such as witnessing them in person as they occur to others, learning that they occur to a close member of the family or a friend, or by repeated exposure to the aversive details of such events (APA, 2013). According to this definition traumatic events seem to first and foremost be characterized by exposure to an imminent *threat to life*. However, in cases of sexual violence, for example, there is not necessarily an obvious life threat.

This assumption has been the source of scientific debate ever since the diagnosis of PTSD was first introduced in DSM-III, resulting in several modifications of the stressor criterion (APA, 1980, 1987, 1994, 2013). While some have argued for a more restrictive definition (McNally, 2003), others advocate for a more inclusive approach that encompasses stressful life experiences such as sexual harassment (Avina & O'Donohue, 2002), bereavement (Zisook, Chentsova-Dutton & Shuchter, 1998), and discrimination (Butts, 2002). Others have argued that Criterion A should be completely abolished, eliminating the etiological assumption of PTSD, while increasing focus on the symptomatic presentation and narrowing criteria to focus on core phenomena such as nightmares and flashbacks (Brewin, Lanius, Novac, Schnyder, & Galea, 2009).

Some research results support the current definition of trauma, with evidence suggesting that those who have experienced Criterion A events are at higher risk for PTSD than those who have experienced other severe stressors, and that few cases of PTSD occur in the absence of Criterion A events (Kilpatrick, Resnick & Acierno, 2009). However, there is evidence to show that PTSD can develop in response to stressful experiences that do not meet Criterion A. For instance, Bodkin, Pope, Detke & Hudson (2007) found that, regardless of whether or not patients had experienced Criterion A trauma, PTSD symptoms were common amongst patients presenting for pharmacologic treatment of major depressive disorder. In particular, when comparing groups of patients who had been exposed to Criterion A trauma and those who had not, the prevalence of those who met all other PTSD criteria was the same in the two groups. Other studies comparing PTSD symptoms following Criterion A versus non-Criterion A stressful life experiences have revealed similar results, suggesting that both types of experiences lead to similar levels of PTSD symptoms. This has been found, for example, using self-report measures in samples of college students (Robinson, Kolts, & Watkins, 2006; Robinson & Larson, 2010). Surprisingly, other studies have reported even higher levels of PTSD symptoms following severe non-Criterion A events than Criterion A traumas. These results have been found using either self-report measures or clinical interviews in samples of undergraduate students (Dewey & Schuldberg, 2013; Gold, Marx, Soler-Baillo, & Sloan, 2005), female nurses (Roberts et al., 2012) and adults in a community sample (Van Hooff, McFarlane, Baur, Abraham, & Barnes, 2009). However, other studies have revealed the opposite, i.e. higher levels of PTSD symptoms following Criterion A events than non-Criterion A events (Boals & Schuettler, 2009).

These inconsistent findings can be explained, at least partially, by different methodologies and definitions of trauma used in the studies. In order to synthesize existing research, Larsen and Pacella (2016) conducted a meta-analysis, comparing PTSD symptoms

stemming from an event that satisfies Criterion A with those stemming from severe stressors that are incongruent with Criterion A. They found the DSM-III and -IV definitions of trauma to only minimally differentiate Criterion A stressors from other severe stressors with regards to PTSD symptoms, leading the authors to conclude that there is a lack of clear boundaries between traumatic events and other stressors. Larsen and Berenbaum (2017) subsequently examined whether the DSM-5 definition of trauma was associated with higher levels of PTSD than the DSM-IV definition. Their sample consisted of a community sample of women ( $n=106$ ) who had experienced Criterion A trauma or a severe stressor. Results revealed that severity of PTSD symptoms and level of impairment was similar across different types of stressful life experiences, regardless of whether or not they meet Criterion A for trauma according to either DSM-IV or DSM-5. In their study, they also assessed the independent effect of a life-threat during the event on PTSD symptoms, as either rated objectively by an independent rater or subjectively via self-report. They found that individual perception or appraisal of a life threat, as assessed via self-report, was the only independent predictor of PTSD symptoms. These results suggest that individual perception of a life threat may be of more value than objectively determining type of event when it comes to predicting PTSD symptoms. The importance of perceived life threat for predicting symptom severity of PTSD has also been reported in research on rape-victims (Kilpatrick et al., 1989; Ullman & Filipas, 2001), motor vehicle accident victims (Blanchard et al., 1995) and patients who have suffered from major traumatic injury (Holbrook, Hoyt, Stein, & Sieber, 2001). Additionally, research among patients receiving treatment for PTSD has revealed that “hotspots” in trauma memories, involving moments of peak emotional distress, more often involved cognitions related to psychological threat to the self than cognitions regarding a threat to one’s physical integrity (Grey & Holmes, 2008; Holmes, Grey, & Young, 2005). These results highlight the importance of exploring the threat that people experience in relation to trauma.



The conceptualization of trauma has critical implications for research, theory, and practice. Our understanding of trauma guides research and has a direct impact on treatment development and who receives treatment following such an experience. The literature indicates that PTSD symptoms are not evoked solely in response to Criterion A events, and that the current definition of trauma does not serve as a good predictor of who comes to develop PTSD. Even though this ongoing dispute has resulted in several modified definitions of the stressor criterion, the debate remains unresolved. In particular, it has kept research on trauma and PTSD focused on the objective characteristics of trauma and which types of events are severe enough to lead to the development of PTSD. However, understanding of what exactly it is that differentiates traumatic from non-traumatic experiences is still lacking.

### **Aversive social experiences, social anxiety disorder and PTSD**

Even though PTSD is the only mental disorder that holds a specific etiological event as a part of the diagnostic criteria, it is not the only disorder that has been related to specific precipitating events. In particular, when it comes to social anxiety disorder (SAD), the literature suggests that aversive social experiences (e.g. peer victimization and teasing, sexual harassment or abuse, and public humiliation or ridicule) may be related to both the onset and development of the disorder (Bandelow et al., 2004; Chartier, Walker, & Stein, 2001; McCabe, Miller, Laugesen, Antony, & Young, 2010; Siegel, La Greca, & Harrison, 2009; Storch, Masia-Warner, Crisp, & Klein, 2005). Such experiences are characterized by themes of humiliation, rejection, embarrassment, or criticism and most people with SAD report experiencing one or multiple such events around the time of onset or exacerbation of their disorder (Hackmann, Clark, & McManus, 2000).

Aversive social experiences have mostly been studied in the context of SAD. However, research has shown that patients with SAD have reported PTSD symptoms (i.e. reexperiencing, avoidance, and hyperarousal) in response to a stressful social event. In particular, Erwin,

Heimberg, Marx and Franklin (2006) compared the frequency of certain PTSD symptoms between groups of 45 patients diagnosed with SAD and 30 non-anxious controls. First, their results revealed that socially stressful events were very common experiences, with all participants in the SAD group and 70% of the control group reporting exposure to such events. Second, they found that over a third of participants with SAD met all DSM-IV criteria for PTSD in response to a stressful social event. Out of 29 participants who had been exposed to both highly stressful social events and Criterion A traumas, four met PTSD criteria for their worst social event but not their worst Criterion A trauma. However, none of the non-anxious controls reported a PTSD symptom pattern even though the majority of them had experienced a stressful social event.

Carleton, Peluso, Collimore and Asmundsson (2011) carried on this line of research, exploring the relationship between negative social events, social anxiety and PTSD symptoms, in a sample of Canadian community members ( $n=601$ ). They compared patterns of social anxiety and PTSD symptoms between those reporting negative social events and those reporting Criterion A events. Their results revealed that 55% of all participants reported experiencing a negative social event, with a third of those rating the social event as worse than a Criterion A trauma they had experienced. Furthermore, participants who reported a significant negative social event (i.e. being humiliated, bullied, or ridiculed) showed higher scores on measures of both SAD and PTSD symptoms, with highest scores among those who considered the negative social event to be worse than their Criterion A trauma. Also, among those who reported a negative social event, PTSD symptoms predicted symptoms of SAD. In sum, these studies underline the severe effects a negative social event can have on individual well-being. They further suggest that a traumatic reaction to stressful social experiences may influence the development of both SAD and PTSD.

The association between PTSD and SAD is further supported by the frequent co-occurrence of these disorders (Collimore, Carleton, Hofmann, & Asmundsson, 2010; McMillan, Sareen, & Asmundsson, 2014). A plausible explanation for this co-occurrence, at least for a subset of individuals, is that PTSD and SAD developed simultaneously from one or more stressful social events that were experienced as traumatic. The comorbid state of these disorders is likely to lead to an increased impairment in both social and occupational functioning, such that those who suffer from both PTSD and SAD are more likely to also suffer from other mental disorders, report greater suicidal risk, and greater impairment in overall functioning (Kashdan et al., 2006; McMillan, Asmundsson, & Sareen, 2017).

### **A new perspective on trauma**

We question, in light of the unresolved Criterion A debate, how productive it is to draw a line between traumatic and non-traumatic stressors based on the event itself and its objective characteristics. We acknowledge the fact that some events are more likely to result in PTSD than others, so that victims of sexual assault, for example, develop PTSD at much higher rates than do those who experience natural disasters (Friedman, Resick, Bryant, & Brewin, 2011). We propose, however, that it may be more fruitful to assess the *threat* that an individual experiences in a given situation, e.g. following physical or sexual assault (Larsen and Berenbaum, 2017) than be solely concerned about the type of event the he or she experienced. Furthermore, that in addition to an appraisal of *threat to life* there may exist at least one other important type of threat that can best be described as *social threat*, involving the experience of severe rejection and humiliation. It should be pointed out that this is a very different approach than distinguishing between interpersonal trauma and other trauma, as has often been done in the literature (Forbes et al., 2012; Ford, Stockton, Kaltman, & Green, 2006; Kisiel et al., 2014) because most traumatic experiences involve other people and the term “interpersonal” does not specify what kind of threat is involved. Both types of threat seem to have the capacity to lead

to PTSD symptoms and may also play a role in the development of other mental disorders (e.g. SAD). From an evolutionary perspective, it can be argued that the experience of being rejected from one's social group may have been just as life-threatening as natural disasters or attacks from wild animals. Humans have always been social creatures and dependent on their group for vital necessities such as shelter, access to food, and mating (Björnsson, 2016; Gilbert, 2002; Gilboa-Schechtman, Shachar, & Helpman, 2014). We propose that in order to better understand what exactly it is about stressful experiences that makes them traumatic, the literature needs to move forward from focusing on types of events, and towards a greater focus on what kinds of *threat* people experience.

### **Trauma and psychopathology**

Although the presence of a traumatic experience is the prerequisite for a diagnosis of PTSD, such experiences place individuals at high risk for multiple other psychiatric disorders. In particular, research has shown that traumatic events may also be a risk factor for panic disorder (PD; Bandelow, Späth, Tichauer, Broocks, Hajak, & Rüther, 2002; Leskin & Sheikh, 2002; Safren, Gershuny, Marzol, Otto, & Pollack, 2002), generalized anxiety disorder (GAD) and major depressive disorder (MDD; Grant, Beck, Marques, Palvo, & Clapp, 2008; McQuaid, Pedrelli, McCahill, & Stein, 2001), and obsessive-compulsive disorder (OCD; Cromer, Schmidt, & Murphy, 2007; Fontenelle et al., 2012; Lochner et al., 2002). Additionally, exposure to traumatic experiences has been associated with increased risk for attempting suicide (Beristianos, Maguen, Neylan, & Byers, 2016; Jankovic et. al., 2013; Read, Agar, Barker-Collo, Davies, & Moskowitz, 2001; Roy, 2001). In light of the association between trauma exposure and various indicators of psychiatric disorders and suicidal behavior, it is important to explore whether these different types of threat may be specific to PTSD and SAD or whether they are related more generally to these different forms of psychopathology.

## **Aims of the present study**

The purpose of the current study is to investigate whether a more fruitful approach to understanding trauma and the development of post-traumatic stress disorder would be to shift the focus away from looking at different types of events and instead towards examining the types of threat that people experience in relation to trauma. This will be done by examining both self-reported threat to one's life and the degree to which women experience social threat during stressful life experiences, and the effect this appraisal has on symptoms of PTSD and women's mental health in general. In particular, we want to estimate if these different types of threat play a role in the development of PTSD and SAD, and furthermore evaluate if they are specific to these disorders or whether they are involved in the development of other mental disorders, such as OCD and PD, and more generally, symptoms of MDD, GAD, and suicidality. Large-scale epidemiological studies are needed in order to clarify the effect of these different types of threat appraisal on psychopathology. To our knowledge, the current epidemiological study of trauma history among adult women in Iceland is the first large-scale study to examine the impact of both *threat to life* and *social threat* on women's mental health.

Specific aims were to:

- 1.** Investigate the association between threat appraisal – i.e., the experience of a threat to life, social threat, or both – and PTSD symptoms.
- 2.** Explore the association between threat appraisal and symptoms of social anxiety disorder, generalized anxiety, depression symptoms, obsessive-compulsive disorder, and panic disorder, and other variables indicative of psychopathology and functioning, such as suicidal ideation, disability compensation and whether the individual is in a relationship or is working.

## Method

### Participants

The target population were all Icelandic adult women, 18-69 years old ( $N=134,770$  according to Statistics Iceland, January 1<sup>st</sup>, 2019). Women older than 69 years old were not specifically recruited but were able to participate in the study if they were interested. The web-based online questionnaire was only available in Icelandic and therefore, the only other inclusion criterion was adequate proficiency in reading and understanding Icelandic. At the time of data exportation for this study (March 2019) 29,666 women had taken part in the study, although not all the women completed the questionnaire. The study is still ongoing and will be open for participation until July 1<sup>st</sup>, 2019. For purposes of the current study, statistical analyses were only carried out on a portion of the sample ( $N = 8992$ ; participants who were able to answer questions about both social threat and threat to life, see statistical analyses).

Table 1 shows demographic characteristics of the participants, including age, educational level, employment status and marital status. Mean age was around 44 years ( $SD \approx 14$ ). The educational level is quite high with over half of participants having completed an undergraduate degree or higher (>50%). A vast majority of the women state that they are working (>70%), but around 9% report being on disability compensation. Most report being married, cohabitating, or in a relationship (>70%).

Table 1. *Sociodemographic characteristics of all participants, and for the sample used in this study.*

	All	Sample
<b>Valid <math>n</math> (%)</b>	29,666	8,992
<b>Age, M (SD)</b>	44.1 (14.1)	43.5 (14.4)
<b>Highest education completed, <math>n</math> (%)</b>		
Grade school	4,467 (15.1)	1,462 (16.3)
Junior college	5,524 (18.6)	1794 (20.0)

Multi-craft trade skill	1700 (5.7)	540 (6.0)
College or university	15,244 (51.4)	4,573 (50.9)
Other	1,881 (6.3)	586 (6.5)
Unable/prefer not to say	133 (.4)	37 (.4)
<b>Marital status, n (%)</b>		
Married	13,470 (45.4)	3,553 (39.5)
Cohabiting	6,167 (20.8)	1,980 (22.0)
In a relationship, not cohabiting	2,218 (7.5)	858 (9.5)
Single	6,450 (21.7)	2,459 (27.3)
Widow	657 (2.2)	124 (1.4)
Unable/prefer not to say	155 (.5)	37 (.4)
<b>Employment status, n (%)</b>		
Working	21,011 (70.8)	6,568 (73.0)
Student	4,309 (14.5)	1,496 (16.6)
On disability compensation	2,842 (9.6)	796 (8.9)
Retired on pension	1,595 (5.4)	482 (5.4)
Working at home/parental leave	1,432 (4.8)	422 (4.7)
Sick leave, longer than 2 months	893 (3.0)	230 (2.6)
Unemployed/looking for work	718 (2.4)	252 (2.8)
Unable/prefer not to say	234 (.8)	67 (.7)

---

## Measures

*Demographic characteristics* were assessed with questions on age, marital status, highest level of education completed, employment status, income, and sick leave.

*The Life Events Checklist for DSM-5* (LEC-5; Weathers et al., 2013a) was used for screening of potentially traumatic life experiences. For purposes of the current study, the measure was adapted by dropping some of the original items, combining others and adding new ones. Not included in this study were items concerning exposure to toxic substances and severe human suffering. Three of the original items, concerning fire or explosion, transportation accidents and serious accident at work, home or during recreational activity,

were combined into a single item. Items regarding physical assault and assault with a weapon were also combined into one item. Items concerning potentially traumatic social events, such as bullying, discrimination, public ridicule/humiliation, separation/divorce, adultery or rejection by a spouse, along with items concerning difficult childbirth and child-rearing, were added to the instrument. For these items, participants reported whether they had experienced the event themselves or not. Subsequently, participants were asked to indicate which event they considered the worst that ever happened to them and affected them the most to the present day. This was done to further assess symptoms and appraisals related to that particular traumatic event. Follow-up items were administered when certain experiences were selected as the worst. These items included questions about the degree of experienced threat to life and social threat when the event took place. The item regarding experienced social threat was displayed when the following events were selected as the worst: physical assault or assault with a weapon; sexual assault; other unwanted or uncomfortable sexual experience; the 6 social events added to the LEC-5; and losing custody of a child. The option to select both threat to life and social threat was added late in the study for some of the items (i.e. for sexual assault) and for some of them there was only the option to indicate either type of threat. For example, people who indicated that their worst trauma was a natural disaster were only asked about experienced threat to life, but not social threat. We only included participants who could indicate both types of threat for their worst event. There is no total or composite score generated from the LEC-5. The instrument is simply used to identify exposure to events that can be considered traumatic events. Psychometric properties of an earlier version of the LEC instrument have been found to be adequate, particularly in terms of temporal stability and convergent validity (Gray, Litz, Hsu & Lombardo, 2004). LEC-5 was translated to Icelandic by Berglind Guðmundsdóttir, Ingunn Hansdóttir, Agnes B. Tryggvadóttir and Guðlaug Friðgeirsdóttir (unpublished translation). Psychometric properties have not been evaluated for the Icelandic version.



*The PTSD checklist for DSM-5 (PCL-5; Weathers et al., 2013b)* is a 20-item self-report measure that corresponds to all symptoms of PTSD as described in DSM-5. Participants are asked to indicate how much each symptom has bothered them in the past month, with items rated on a 5-point Likert scale ranging from 0 (“not at all”) to 4 (“extremely”). Participants were asked to keep in mind the traumatic experience they reported as their worst while answering these questions. Scores range from 0-80, with higher scores indicating greater severity. PCL-5 has been found to be a psychometrically sound measure of PTSD symptoms with strong internal consistency, test-retest reliability as well as convergent and discriminant validity (Blevins, Weathers, Davis, Witte, & Domino, 2015; Bovin et al., 2016; Wortmann et al., 2016). A cut-off score of 33 was used in the present study to indicate a probable PTSD diagnosis, this has been suggested by the developers of PCL-5 to be a reasonable value (Weathers et al., 2013). PCL-5 was translated to Icelandic by Berglind Guðmundsdóttir, Ingunn Hansdóttir, Agnes B. Tryggvadóttir and Guðlaug Friðgeirsdóttir (unpublished translation). Psychometric properties have not been evaluated for the Icelandic version. In this study, internal consistency of the scale was excellent ( $\alpha = .95$ ).

*Patient Health Questionnaire (PHQ-9; Kroenke & Spitzer, 2002; Kroenke, Spitzer, & Williams, 2001)* was used to estimate symptoms and severity of depression. The instrument is a nine item self-report measure where respondents are asked how often, over the last two weeks, they have been bothered by each of the nine depression symptoms listed in DSM-IV. Items are rated on a 4-point Likert scale ranging from 0 (“not at all”) to 3 (“nearly every day”). Scores range from 0-27, with higher scores indicating more severity. This instrument has been found to serve as a reliable and valid diagnostic and severity measure of depression (Kroenke et al., 2001; Martin, Rief, Klaiberg, & Braehler, 2006). A cut-off score of 12 was used to indicate a probable MDD diagnosis, which has been shown to provide the best estimate using the Icelandic version (Pálsdóttir, 2007). In the current study, two Icelandic translations of PHQ-

9 were combined by Andri Björnsson, one version translated by Auður Þórisdóttir (unpublished translation) and the other by Agnes Agnarsdóttir, Hafrún Kristjánsdóttir, Jakob Smári, Jón Friðrik Sigurðsson, and Pétur Tyrfingsson (Pálsdóttir, 2007). In this study, internal consistency of the scale was good ( $\alpha = .89$ ).

*Generalized Anxiety Disorder-7 (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006)* was used to estimate anxiety symptoms and screen for general anxiety disorder (GAD). The scale is a seven item self-report measure in which respondents are asked how often they have been bothered by certain symptoms over the past two weeks. Items are rated on a 4-point Likert scale ranging from 0 (“not at all”) to 3 (“nearly every day”). Scores range from 0-21, with higher scores indicating more symptom severity. Studies have found the scale to have good reliability and to serve as a valid measure of GAD symptoms (Löwe et al., 2008; Spitzer et al., 2006). In this study a score of 10 or greater was used to indicate a probable GAD diagnosis, this threshold has been reported to have good sensitivity and specificity for that purpose (Spitzer et al., 2006). The measure was translated to Icelandic by Haraldur Þorsteinsson. Studies have found the translated version to have sound psychometric properties, with good reliability and construct validity (Ingólfssdóttir, 2014; Ólafsson, 2018). In this study, internal consistency of the scale was excellent ( $\alpha = .90$ ).

*The Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1997; 1998)* was used to determine a probable diagnosis of social anxiety disorder (SAD), obsessive compulsive disorder (OCD) and panic disorder (PD). MINI is designed as a structured diagnostic interview that assesses the current existence of 17 DSM-IV, Axis I, mental disorders. Traditionally the interview is administered in a clinician rated format but in the current study MINI was delivered as a self-report measure. Only three modules were used, assessing social anxiety disorder (SAD), obsessive compulsive disorder (OCD) and panic disorder (PD), and most of the questions were abbreviated for the online questionnaire.

Psychometric properties for MINI administered via self-report have never been studied but the traditional format has been found to show good test-retest and inter-rater reliability, as well as good sensitivity and specificity for the three disorder modules used in the current study (Lecrubier et al., 1997; Sheehan et al., 1997; Sheehan et al., 1998). An Icelandic translation by Pétur Tyrfingsson was used in the current study, which has been shown to have good inter-rater reliability and convergent validity with self-report measures of depression and anxiety symptoms (Sigurðsson, 2008).

*The Composite International Diagnostic Interview* (CIDI; Kessler & Üstün, 2004; Robins et al., 1988; World Health Organization, 1990) was used to assess suicidal ideation and attempts. CIDI is a comprehensive diagnostic interview designed to generate diagnosis of mental disorders in accordance with diagnostic criteria from both DSM-IV and ICD-10, and studies have shown it to be both a valid and reliable instrument for those purposes (Wittchen, 1994). However, in the current study, only questions concerning suicidal ideation and attempts were used. These items were translated to Icelandic by Hildur Ásgeirsdóttir and Védís Eiríksdóttir (unpublished translation) and their psychometric properties have not been examined.

## **Procedure**

The study was launched in March 2018. All Icelandic women, 18-69 years old, were invited to participate. Women older than 69 years old were not specifically recruited but were able to participate in the study if they were interested. The study was advertised on media outlets and on social media and text messages were sent to all eligible participants who had a registered phone number. In order to participate, women had to log in with their personal identification number supplied by the National Register of Iceland. They also had to provide informed consent before proceeding to the online questionnaire. The study was approved by the National Bioethics Committee (VSNb2017110046/03.01).

## Statistical analyses

The current study is a retrospective cohort study based on self-reporting of trauma history and health outcomes. Before addressing all aims, data was screened for outliers and missing data for all variables of interest. Descriptive statistics were also examined, such as background variables and prevalence of probable mental disorders. For some types of trauma (e.g. exposure to natural disasters or fire, explosion and transportation accidents) it was not possible to estimate both threat to life and social threat, and for some types of trauma (e.g. sexual assault) the option to estimate both types of threat was added later in the study. This resulted in missing data for the two key variables, assessing participants' appraisal of their traumatic experience as a *threat to life* and/or a *social threat*. In light of these missing data, all participants who did not have a valid answer to either of those questions were excluded from further analyses.

The first and second aim were addressed by looking at valid responses to the items relating to an experience of a *threat to life* and a *social threat* (i.e. rejection and/or humiliation) related to participants' worst trauma. Participants' combination of high (i.e. "severe" or "substantial") and low ("minimal" or "none") responses to these questions were used to divide them into four groups irrespective of the type of traumatic event they considered their worst: 1) Neither threat to life nor social threat (combination of low threat to life and low rejection/humiliation); 2) Primarily threat to life (combination of high threat to life and low rejection/humiliation); 3) Primarily social threat (combination of low threat to life and high rejection/humiliation); 4) Both threat to life and social threat (combination of high threat to life and high rejection/humiliation). These groups were used to estimate the effect of threat appraisal on PTSD symptoms (i.e. PCL-5 $\geq$ 33) as well as scores on other psychopathology measures (i.e. GAD-7, PHQ-9, MINI-SAD, MINI-OCD, MINI-PD, WHO WMH-CIDI). Statistically, the first and second aims were addressed by using one-way analysis of covariance (ANOVA), chi-square tests of independence, and Poisson log-linear models.

ANOVAs were used to examine mean differences in continuous psychopathology measures (i.e. scores on PCL-5, GAD-7, and PHQ-9) between the four groups based on threat appraisal. Post hoc comparisons using the Tukey HSD post hoc test were used to break down significant differences between group means. Chi-square tests were used to examine the association between threat appraisal and whether or not participants scored above or below cut-off scores for probable diagnoses of mental disorders (i.e., on PCL-5, GAD-7, PHQ-9, MINI-SAD, MINI-OCD, MINI-PD), whether they reported lifetime suicide ideation, intentions and attempts, as well as the association with various background variables. Poisson log-linear models with robust error variance were used to obtain relative risks (RRs) with 95% confidence intervals (CIs). Risks were calculated for each group of women who experienced a high degree of social and/or life threat in relation to their worst trauma, with those who experienced neither type of threat as a reference group. Outcome variables were scores on PCL-5 ( $\geq 33$ ), PHQ-9 ( $\geq 12$ ), GAD-7 ( $\geq 10$ ), MINI-SAD, MINI-PD, MINI-OCD and attempted suicide. Adjustments were made for age, educational level, marital status, and type of worst traumatic event.

## Results

Table 2 provides an overview of the different types of traumatic events which participants considered the worst they had ever experienced, and the rates at which those events were experienced to involve a threat to life or social threat. There was a significant association between type of event experienced and whether or not participants experienced a high life threat  $\chi^2(13) = 49.597, p < 0.001$ . The types of events most likely to involve an experience of a high threat to life were captivity and physical assault with a weapon. Overall, participants tended to rate their experience of social threat as high for most types of events. However, a significant association was found between type of event experienced and whether or not participants experienced a high degree of social threat;  $\chi^2(13) = 804.685, p < 0.001$ . The types of events most likely to involve the experience of a high social threat were adultery or rejection

by a spouse, bullying, public ridicule or humiliation on social or mass media, sexual assault, and other humiliating experiences. For social events (e.g. bullying, discrimination, public ridicule or humiliation on social media) participants tended to rate their experience of threat to life as low while their experience of social threat was generally rated as high. It is worth pointing out that Criterion A experiences thought to involve a high degree of threat to life, such as experiencing a physical assault, combat, or serious injury, were more likely to be associated with social threat than threat to life.

Table 2. *Types of traumatic events considered the worst and rates at which they were experienced to involve a high degree of threat to life and/or social threat*

<b>Traumatic event</b>	<b>Threat to life</b>	<b>Social threat</b>
	Rated as high n (%)	Rated as high n (%)
Physical assault with a weapon (N=942)	414 (43.9)	711 (75.5)
Sexual assault (N=1121)	210 (18.7)	860 (76.7)
Other unwanted or uncomfortable sexual experience (N=557)	26 (3.4)	308 (55.3)
Combat or exposure to war-zone (N=10)	3 (30.0)	4 (40.0)
Captivity (N=16)	9 (56.3)	11 (68.8)
Serious injury, harm, or death caused to someone else (N=9)	1 (11.1)	5 (55.6)
Bullying (N=1688)	144 (8.5)	1558 (92.3)
Discrimination (N=41)	1 (2.4)	30 (73.2)
Public ridicule or humiliation on social or mass media (N=115)	8 (7.0)	97 (84.3)

Other humiliating experience (N=588)	53 (9.0)	525 (89.3)
Divorce or separation (N=1547)	125 (8.1)	1070 (69.2)
Adultery or rejection by a spouse (N=1331)	89 (6.7)	1266 (95.1)
Losing custody of a child (N=56)	12 (21.4)	47 (83.9)
Other stressful experience (N=971)	81 (8.3)	482 (49.6)

Table 3 shows the relationship between participants' appraisal of their traumatic experience as primarily threat to life, primarily social threat, neither, or both, and various background variables and psychopathology measures. This division into four groups based on high or low threat appraisal led to vastly different group sizes as most participants ( $n = 5177$ ) reported experiencing primarily high social threat and relatively few reported experiencing primarily threat to life ( $n = 89$ ).

Results revealed that appraisal had a significant effect on mean scores of PCL-5,  $F(3, 6786) = 359.9, < .001$ ; PHQ-9  $F(3, 6635) = 168.4, < .001$ ; and GAD-7,  $F(3, 6864) = 147.1, p < .001$ . Post hoc comparisons using the Tukey HSD test revealed that those who appraised their trauma as involving both a threat to life and social threat had significantly highest mean scores on all three measures. Women who experienced neither type of threat had significantly lowest mean scores on PCL-5. On PHQ-9 and GAD-7 the mean score was significantly lower for women who experienced neither type of threat than for women who experienced both types of threat, and for women who experienced primarily social threat, but not for those who experienced primarily threat to life trauma. Mean scores on these three psychopathology measures did not significantly differ between those who experienced primarily threat to life and those who experienced primarily social threat.

Table 3. Relationship between threat appraisal and PTSD symptoms, background variables, suicidality, and other measures of psychopathology (PCL-5, PHQ-9, GAD7, MINI modules)

	<b>Threat appraisal</b>			
	Neither N=1010	Primarily threat to life N=89	Primarily social threat N=5177	Both N=1043
<b>Background variables</b>				
In a relationship (%)	74.6	78.7	70.9	64.8
Working (%)	77.2	67.4	75.9	61.8
Disability comp (%)	4.5	7.9	6.8	20.0
<b>PCL-5</b>				
M (SD)	11.5 (12.6)	20.1 (16.7)	22.5 (16.8)	36.2 (19.0)
prob. PTSD (%)	9.1	26.5	27.9	56.6
<b>PHQ-9</b>				
M (SD)	5.0 (4.6)	6.3 (5.6)	7.5 (5.9)	10.8 (6.8)
prob. MDD (%)	9.2	15.4	20.9	42.9
<b>GAD-7</b>				
M (SD)	4.7 (4.0)	8.7 (5.4)	6.3 (4.8)	9.2 (5.5)
prob. GAD (%)	11.3	24.1	22.1	42.5
<b>MINI-SAD</b>				
prob. SAD (%)	10.3	12.4	20.7	34.3
<b>MINI-PD</b>				
prob. PD (%)	1.4	3.6	2.7	12.1
<b>MINI-OCD</b>				
prob. OCD (%)	1.4	6.0	3.5	10.4
<b>Lifetime suicidality</b>				



Ideation (%)	18.3	37.1	30.8	58.7
Plan (%)	8.5	21.3	16.3	39.6
Attempt (%)	2.8	10.1	5.6	23.2

*Note.* PCL-5: The PTSD checklist for DSM-5. PHQ-9: Patient Health Questionnaire. GAD-7: Generalized Anxiety Disorder-7. MINI-SAD, MINI-Panic and MINI-OCD: The Social Anxiety Disorder, Panic Disorder and Obsessive-Compulsive Disorder modules of the Mini Neuropsychiatric Interview (MINI). Lifetime suicidality: The Composite International Diagnostic Interview.

There was a also significant relation between threat appraisal and whether or not participants scored above a clinical cut off score on PCL-5,  $\chi^2(3) = 541.760, p < 0.001$ , PHQ-9  $\chi^2(3) = 311.982, p < 0.001$ , GAD-7  $\chi^2(3) = 278.922, p < 0.001$ , MINI-SAD  $\chi^2(3) = 30.422, p < 0.001$ , MINI-Panic  $\chi^2(3) = 73.741, p < 0.001$  and MINI-OCD  $\chi^2(3) = 33.724, p < 0.001$ . Those who experienced both threat to life and social threat were most likely to score above the cut-off, and those who experienced neither were most likely to score below the cut-off.

There were also significant relationships between threat appraisal and lifetime suicide ideation  $\chi^2(3) = 440.590, p < 0.001$ , lifetime suicide planning  $\chi^2(3) = 48.772, p < 0.001$ , and lifetime suicide attempts  $\chi^2(3) = 71.857, p < 0.001$ . Those who experienced both threat to life and social threat were most likely to report lifetime suicide ideation, planning, and attempts, whereas those who experienced neither were least likely to report any lifetime suicidal ideation or intentions. We found a significant association between threat appraisal and whether or not participants were on disability compensation  $\chi^2(3) = 220.416, p < 0.001$ , such that those who experienced both threat to life and social threat were most likely to be on disability and those who experienced neither were least likely. Significant relations were not found between threat appraisal and whether or not participants were in a relationship or working.

Table 4 shows the association between threat appraisal related to participants' worst trauma and PTSD symptoms, expressed as relative risk (RR). Relative to those who experienced neither threat to life nor social threat, all other groups had an increased risk of a

probable PTSD diagnosis. Adjusted for age, education, income, marital status, and worst event, we found that women who experienced either primarily threat to life or primarily social threat had a threefold risk of a probable PTSD diagnosis compared to those who experienced neither ( $RR=2.97$ ; 95% CI 1.75-5.03 for threat to life;  $RR= 3.00$ ; 95% CI 2.34-3.85 for social threat; see Table 4). Those who experienced both types of threat, had a sixfold risk of a PTSD diagnosis compared to those who experienced neither ( $RR=6.27$ ; 95% CI 4.81-8.17; Table 4).

Table 4. Association of threat appraisal of worst trauma and a probable PTSD diagnosis (PCL-5  $\geq 33$ ), expressed as RR and 95% CIs

Threat appraisal	Probable PTSD diagnosis			
	not PTSD	Prob. PTSD	RR (95% CI)	RR (95% CI) <sup>a</sup>
Neither	884 (18.4)	89 (4.5)	1 (ref.)	1 (ref.)
Primarily threat to life	61 (1.3)	22 (1.1)	2.90 (1.92-4.36)	2.97 (1.75-5.03)
Primarily social	3448 (71.7)	1331 (67.1)	3.05 (2.49-3.73)	3.00 (2.34-3.85)
Both	414 (8.6)	541 (27.3)	6.19 (5.04-7.60)	6.27 (4.81-8.17)

Note. Probable PTSD diagnosis: score  $\geq 33$  on PCL-5, The PTSD checklist for DSM-5. RR: Relative Risk. CI: Confidence Intervals.

a. Adjusted for age, education, income, marital status, and type of worst traumatic event

Table 5 shows the association between threat appraisal related to participants' worst trauma and a probable SAD diagnosis, expressed as relative risk (RR). Relative to those who experienced neither threat to life nor social threat, those who experienced primarily social threat and those who experienced both types of threat had an increased risk of scoring above cut-off on MINI-SAD. Adjusted for age, education, income, marital status, and worst event, we found that those who experienced primarily social threat were around two to three times more likely to have a probable SAD diagnosis and those who experienced both types of threat were at greatest risk of having a probable SAD diagnosis, compared to those who experienced neither type of threat (see Table 7). The risk of a probable SAD diagnosis was not significantly

higher for those who experienced primarily threat to life when background variables were taken into account (RR=1.70; 95% CI, .59-4.90).

Table 5. Association between threat appraisal of worst trauma and a probable SAD diagnosis (MINI-SAD), expressed as RR and 95% Cis

Threat appraisal	Probable SAD diagnosis			
	not SAD	prob. SAD	RR (95% CI)	RR (95% CI) <sup>a</sup>
Neither	906 (9.9)	104 (5.1)	1 (ref.)	1 (ref.)
Primarily threat to life	78 (0.1)	11 (1.0)	2.23 (1.17-4.23)	1.70 (.59-4.9)
Primarily social	4105 (72.9)	1072 (67.5)	2.61 (1.98-3.44)	3.14 (2.21-4.46)
Both	685 (17.0)	358 (26.5)	5.07 (3.81-6.75)	5.58 (3.81-8.16)

Note. Probable SAD diagnosis estimated with MINI-SAD, The Social Anxiety Disorder module of the Mini Neuropsychiatric Interview (MINI). RR: Relative Risk. CI: Confidence Intervals.

a. Adjusted for age, education, income, marital status, and type of worst traumatic event

Table 6 shows the association between threat appraisal related to the participants' worst trauma and depression symptoms, expressed as relative risk (RR). Relative to those who experienced neither threat to life nor social threat, women who experienced primarily social threat and women who experienced both types of threat had an increased risk of scoring above cut-off on PHQ-9. Adjusted for age, education, income, marital status, and worst event, we found that those who experienced primarily social threat were around two times more likely to report symptoms of moderate to severe depression (see Table 6). However, those who experienced both types of threat were at greatest risk, compared to women who experienced neither type of threat (see table 6). The risk of having moderate to severe symptoms of depression was not significantly higher for those who experienced primarily threat to life.

Table 6. Association of threat appraisal related to worst trauma and depression symptoms (PHQ-9≥12), expressed as RR and 95% Cis

<i>Depression symptoms</i>				
<b>Threat appraisal</b>	<b>not MDD</b>	<b>Prob MDD</b>	<b>RR (95% CI)</b>	<b>RR (95% CI)<sup>a</sup></b>
Neither	847 (16.4)	86 (5.8)	1 (ref.)	1 (ref.)
Primarily threat to life	66 (1.3)	12 (0.8)	1.67 (.96-2.92)	1.53 (.71-3.31)
Primarily social	3719 (72.1)	985 (66.6)	2.27 (1.84-2.80)	2.29 (1.77-2.96)
Both	528 (10.2)	396 (26.8)	4.65 (3.75-5.76)	4.71 (3.56-6.22)

*Note.* Depression symptoms: score  $\geq 12$  on PHQ-9, Patient Health Questionnaire. RR: Relative Risk. CI: Confidence Intervals.

a. Adjusted for age, education, income, marital status, and type of worst traumatic event

Table 7 shows the association between threat appraisal of worst trauma and symptoms of moderate to severe anxiety, expressed as relative risk (RR). All models were significant at  $\alpha < 0.001$ . All groups had an increased risk of reporting symptoms of moderate to severe anxiety, compared to those who experienced neither threat to life nor social threat. Adjusted for age, education, income, marital status, and worst event, we found that those who experienced either primarily threat to life or primarily social threat were about two times more likely to report such symptoms (see Table 7). This risk was increased by twofold for those who experienced both types of threat, with a risk of 4.04 (95% CI, 3.15-5.19), compared to those who experienced neither type of threat (model<sup>b</sup>; see Table 7).

Table 7. Association of threat appraisal of worst trauma and anxiety symptoms ( $GAD-7 \geq 10$ ), expressed as RR and 95% CIs

<i>Probable GAD diagnosis</i>				
<b>Threat appraisal</b>	<b>not GAD</b>	<b>prob. GAD</b>	<b>RR (95% CI)</b>	<b>RR (95% CI)<sup>a</sup></b>
Neither	841 (16.0)	107 (6.6)	1 (ref.)	1 (ref.)
Primarily threat to life	63 (1.2)	20 (1.2)	2.14 (1.40-3.25)	2.38 (1.42-4.0)
Primarily social	3788 (72.1)	1074 (66.5)	1.96 (1.63-2.36)	2.28 (1.81-2.86)
Both	561 (10.7)	414 (25.6)	3.76 (3.10-4.56)	4.04 (3.15-5.19)

*Note.* Probable GAD diagnosis: Score  $\geq 10$  on GAD-7, Generalized Anxiety Disorder-7. RR: Relative Risk. CI: Confidence Intervals.

a. Adjusted for age, education, income, marital status, and type of worst traumatic event

Table 8 shows the association between threat appraisal and symptoms of OCD, expressed as relative risk (RR). Relative to those who experienced neither threat to life nor social threat, women who experienced primarily social threat and women who experienced both types of threat were at significantly greater risk of reporting symptoms of OCD, with those who experienced both types of threat at greatest risk. However, adjusted for age, education, income, marital status, and worst event, we found that the increase in risk was not large, ranging from 1-3% for those who experienced primarily social threat and 5-10% for those who experienced both types of threat. Risk of reporting OCD symptoms was not significantly greater for those who experienced primarily threat to life. However, this seems to be due to a lack of power stemming from small group size ( $N = 89$ ), since this group had a higher rate of participants with a probable OCD diagnosis than the primarily social threat group.

Table 8. *Association of threat appraisal related to worst trauma and OCD symptoms (MINI-OCD), expressed as RR and 95% CIs*

Threat appraisal	Probable OCD diagnosis			
	not OCD	prob. OCD	RR (95% CI)	RR (95% CI) <sup>a</sup>
Neither	948 (8.5)	13 (4.3)	1 (ref.)	1 (ref.)
Primarily threat to life	79 (0.7)	5 (1.7)	1.05 (.99-1.10)	1.01 (.97-1.06)
Primarily social	4726 (70.5)	180 (60.0)	1.01 (1.01-1.02)	1.02 (1.01-1.03)
Both	882 (20.2)	103 (34.0)	1.09 (1.07-1.11)	1.08 (1.05-1.10)

*Note.* Probable OCD diagnosis estimated with MINI-OCD, The Obsessive-Compulsive Disorder module of the Mini Neuropsychiatric Interview (MINI). RR: Relative Risk. CI: Confidence Intervals.

a. Adjusted for age, education, income, marital status, and type of worst traumatic event

Table 9 shows the association between threat appraisal and symptoms of PD, expressed as relative risk (RR). Adjusted for age, education, income, marital status, and worst event, we

found that relative to those who experienced neither threat to life nor social threat, women who experienced primarily social threat and women who experienced both types of threat were at significantly greater risk of reporting symptoms of PD, with those who experienced both types of threat at greatest risk (RR=1.08; 95% CI, 1.05-1.10). However the increase in risk was not large, ranging from 1-2% for those who experienced primarily social threat and 5-10% for those who experienced both types of threat. Risk of reporting OCD symptoms was not significantly greater for those who experienced primarily threat to life. However, this seems to be due to a lack of power stemming from small group size (N = 89), since this group had a higher rate of participants with a probable PD diagnosis than the primarily social threat group.

Table 9. Association of threat appraisal related to worst trauma and Panic disorder symptoms (MINI-PD), expressed as RR and 95% CIs

Threat appraisal	Probable PD diagnosis			
	not PD	prob. PD	RR (95% CI)	RR (95% CI) <sup>a</sup>
Neither	943 (8.9)	13 (4.9)	1 (ref.)	1 (ref.)
Primarily threat to life	81 (1.2)	3 (1.1)	1.02 (.98-1.06)	1.03 (.98-1.08)
Primarily social	4770 (69.0)	132 (49.4)	1.01 (1.00-1.02)	1.01 (1.00-1.02)
Both	866 (20.8)	119 (44.6)	1.11 (1.08-1.13)	1.08 (1.05-1.10)

Note. Probable PD diagnosis estimated with MINI-PD: The Panic Disorder module of the Mini Neuropsychiatric Interview (MINI). RR: Relative Risk. CI: Confidence Intervals.

a. Adjusted for age, education, income, marital status, and type of worst traumatic event

Table 10 shows the association between threat appraisal and attempted suicide, expressed as relative risk (RR). Adjusted for age, education, income, marital status, and worst event, we found that relative to those who experienced neither threat to life nor social threat, women who experienced primarily social threat and women who experienced both types of threat were at significantly greater risk of having attempted suicide, with those who experienced both types of threat at greatest risk. Risk of attempted suicide was not significantly greater for those who

experienced primarily threat to life. However this might be due to small group size ( $n=89$ ), since attempted suicide was more frequently reported in this group than for those who experienced primarily social threat.

Table 10. *Association of threat appraisal related to worst trauma and attempted suicide (CIDI), expressed as RR and 95% Cis*

Threat appraisal	<i>Attempted suicide</i>			
	no	yes	RR (95% CI)	RR (95% CI) <sup>a</sup>
Neither	925 (14.7)	26 (4.9)	1 (ref.)	1 (ref.)
Primarily threat to life	73 (1.2)	9 (1.7)	1.08 (1.02-1.15)	1.07 (.99-1.14)
Primarily social	4562 (72.4)	270 (50.4)	1.03 (1.02-1.04)	1.03 (1.02-1.04)
Both	741 (11.8)	231 (43.1)	1.21 (1.18-1.23)	1.20 (1.15-1.22)

*Note.* RR: Relative Risk. CI: Confidence Intervals.

a. Adjusted for age, education, income, marital status, and type of worst traumatic event

## Discussion

The purpose of the current study was to address and hopefully move forward from the yet unresolved Criterion A debate on the type of events that can be considered traumatic. We propose to focus rather on the types of threat that the individual experiences and believe that this shift may prove to be an essential step in advancing our understanding of trauma and the development of PTSD. We hypothesize that there exist at least two types of threat; *threat to life*, and *social threat*; the latter involving severe rejection and humiliation, that both can be understood with reference to the evolutionary history of our species. This large-scale epidemiological study provides a unique opportunity to systematically examine these different types of threat that women experience in relation to trauma, and their impact on women's psychopathology.

First of all, results revealed that women's experience of social threat is very common in relation to their most traumatic life experiences. This applies to both traditional Criterion A events such as being attacked, which have mostly been related to an imminent threat to life, as well as social experiences such as bullying and discrimination. Overall, women's experience of a life threat was less commonly reported. Even traditional Criterion A events were more likely to be experienced as involving social threat than they were experienced as involving threat to life, which clearly highlights the important role of social threat in potentially traumatic experiences. Overall, very few participants reported experiencing primarily threat to life while the experience of a social threat was very commonly reported. This, in and on itself, provides valuable insight into the relevance of further exploring social threat and its impact on psychopathology.

The first aim of this study was to explore whether threat appraisal is a more constructive approach to understanding trauma than focusing on type of event. In particular, we wanted to explore to what extent threat to life is involved, when social threat is involved, when both types



of threat play a role, and the potential impact this has on the development of PTSD. Results revealed a very similar pattern for those who experienced primarily threat to life and for those who experienced primarily social threat. These two types of trauma had very similar effects on PTSD symptoms. This suggests that social threat can have a considerable effect on women's lives, similar to the impact of events that mainly involve the experience of an imminent threat to one's life. These results line up with former research emphasizing the importance of peoples' appraisal of a threat to life for predicting PTSD symptoms (Blanchard et al., 1995; Larsen & Berenbaum, 2017; Holbrook et al., 2001; Kilpatrick et al., 1989; Ullman & Filipas, 2001). Furthermore, they add to the literature valuable information on the impact of social threat and its association with PTSD. This also adds to former research emphasizing the traumatic impact of aversive social experiences and their association with PTSD (Erwin et al., 2006; Carleton et al., 2011), and further suggests that it may be the appraisal of a social threat in relation to such aversive social experiences that contributes to the development of PTSD.

What is perhaps most compelling about these results is the effect that emerged when looking at results for the women who experienced *both* types of threat, i.e. those who experienced a high threat to life as well as a high degree of social threat. This group was by far most likely to have a probable PTSD diagnosis, with over half of them receiving a probable diagnosis. Risk estimates further revealed that the risk of a probable PTSD diagnosis was indeed six-fold for this group of women, compared to those who experienced neither type of threat. Risk estimates remained the same when background variables were taken into account, indicating that age, educational level, marital status, and type of worst traumatic event did not have an impact on the relationship between threat appraisal and PTSD symptoms. These results strongly indicate that threat appraisal plays an important role in the development of PTSD, and that this type of appraisal is not about *either* experiencing threat-to-life trauma *or* social trauma, but that *both* types of threat may have an impact and an additive effect. Furthermore, this allows

for future research to give greater attention to these different types of threat, to explore what kinds of emotions they evoke, and through which pathways people develop a sense of continuing threat. It should be noted that this approach marks a completely new perspective on trauma from what has been done before. This goes beyond the distinction which has often been made between interpersonal versus other types of trauma, in that here the focus is on the core experience of threat appraisal, independent from all other aspects of the traumatic experience. Most traumatic experiences involve other people and the term “interpersonal” entails little information. That is, knowing whether a trauma would be categorized as interpersonal or not tells us nothing about what kind of threat the experience involves.

The second aim of this study was to investigate whether, and to what extent, threat appraisal is associated with other forms of psychopathology. Of particular interest was the association between threat appraisal and SAD, but also its association with GAD, MDD, OCD, PD and suicidality. When looking at the relationship between primarily experiencing a threat to life and having a probable SAD diagnosis, this experience was not found to involve an increased risk of a probable diagnosis. However, experiencing primarily *social threat* was associated with an increased risk, whereas women in this group were two to three times as likely to have a probable diagnosis of SAD than women who experienced neither type of threat. This risk was then doubled for women who experienced both types of threat. These results are quite compelling and underline the relevance of paying further attention to threat appraisal, and particularly the experience of social threat, when trying to understand the onset and development of SAD. The onset of SAD has often been related to certain precipitating events, and particularly aversive social experiences (Bandelow et al., 2004; Chartier, Walker, & Stein, 2001; McCabe, Miller, Laugesen, Antony, & Young, 2010; Siegel, La Greca, & Harrison, 2009; Storch, Masia-Warner, Crisp, & Klein, 2005). It is plausible that the experience of a

social threat in connection with such stressful social events may work as a key factor in influencing the development of SAD.

Experiencing primarily threat to life was found to be associated with reporting symptoms of GAD, such that women in this group were twice as likely as those who experienced neither type of threat to report symptoms of moderate to severe anxiety. Thus, there seems to be a relationship between the appraisal of an imminent life threat and experiencing general anxiety symptoms. When looking at indicators of symptoms of MDD, OCD, PD and attempted suicide, the experience of a primarily threat to life trauma was not found to involve an increased risk of reporting symptoms of any of these mental disorders, compared to those who experienced neither type of threat. However, it should be noted here that even though this group did not always differ significantly from the group that reported no or minimal threat, it is probable that this can be explained by the vastly different group sizes and that the primarily threat to life group was by far the smallest group, which undermines comparisons with the other groups.

Experiencing primarily social threat was associated with an increased risk of reporting symptoms of MDD and GAD, such that women in this group were two to three times as likely to report such symptoms than women who experienced neither type of threat. Again, this risk was doubled for women who experienced both types of threat. Thus, social threat seems to be related to general symptoms of both depression and anxiety. This is in accordance with previous research showing that trauma history is associated with an increased risk for reporting symptoms of both MDD and GAD (Grant et al., 2008; McQuaid et al., 2001), and furthermore suggests that threat appraisal may play a role in this relationship. Those who experienced primarily social threat and those who experienced both types of threat were also found to have an increased risk of reporting symptoms of OCD, PD and attempted suicide, compared to women who experienced neither type of threat. However, risk estimates for reporting such

symptoms were very small and their clinical relevance is questionable. Thus, these results suggest that the effect that threat appraisal has on these forms of psychopathology is minor. Although the experience of traumatic events has been shown to be a risk factor for OCD (Cromer et al., 2007; Fontenelle et al., 2012; Lochner et al., 2002), PD (Bandelow et al., 2002; Leskin & Sheikh, 2002; Safren et al., 2002), and suicidality (Beristianos et al., 2016; Jankovic et al., 2013; Read et al., 2001; Roy, 2001), these results do not suggest that threat appraisal plays a large role in that association.

In conclusion, results indicate that both types of threat are most strongly related to symptoms of PTSD, but also that the experience of a social threat has a specific association with SAD. Results also indicate that threat appraisal is associated with general symptoms of depression and anxiety, but it seems that this effect is not of much relevance when it comes to ODC, PD and attempted suicide. These results underline the relevance, for both empirical and clinical purposes, of further bringing to attention women's experience of a social threat in relation to traumatic life experiences. Additionally, it is clear that the combined experience of a threat to life and social threat has a large impact on women's psychopathology. These results add to and extend former research emphasizing the impact of peoples' perception of a life threat in relation to trauma for predicting PTSD symptoms (Blanchard et al., 1995; Larsen & Berenbaum, 2017; Holbrook et al., 2001; Kilpatrick et al., 1989; Ullman & Filipas, 2001). Furthermore, they bring to attention the concept of social threat and highlight the important association this type of threat has with both symptoms of PTSD and SAD.

We need a novel approach to understanding trauma. The literature has to a large extent mainly focused on event types and stressor severity (i.e. the debate on Criterion A; McNally, 2003), and it is our belief that identifying the different types of threats that people experience might move the literature closer to understanding what makes an experience traumatic. However, this does bring up the concern, previously related to Criterion A2, of shifting the

definition of trauma from an objective standard to a subjective one (Weathers & Keane, 2007). It may be objected that this approach is simply a step back to considering subjective distress, such as in Criterion A2 in DSM-IV, which was dropped in the fifth version. However, the current approach is rooted in an understanding of the types of threat that are related to reproductive success in our evolutionary history. As has been previously mentioned, exposure to some events is more likely to result in PTSD than others, in that victims of sexual assault, for example, develop PTSD at much higher rates than do those who experience natural disasters (Friedman, Resick, Bryant, & Brewin, 2011). However, knowing that tells us little about why these different types of events have a different impact on the development of PTSD. Perhaps, this is because one of those events is more likely to involve both a severe life threat and severe social threat than the other. For instance, knowing that a woman experienced a traumatic event where she believed that her life was in danger and felt severely humiliated provides us with a much deeper insight into her experience and the potential impact of this trauma, than knowing whether the event she suffered would be categorized as a traditional Criterion A trauma.

### **Strengths and limitations**

This large-scale epidemiological study provides a unique opportunity to systematically examine women's trauma history, the nature of trauma and the impact it has on women's psychopathology in Iceland. However, the study has some limitations that are worth mentioning. First, psychometric properties of the Icelandic version of some of the instruments used in this study have not been thoroughly studied and cut-off points for the general Icelandic population have not been well established. Additionally, administering abbreviated modules from the MINI in a self-report form has not been done before. Thus, little is known about the validity of these measures in the current versions. Second, the items used to estimate the appraisal of threat to life and social threat were only displayed if certain types of trauma were selected as worst. Also, both question were not always included from the beginning for all

types of trauma which resulted in missing data for these variables. However, comparison of the smaller sample with the original one suggested that the sample used in this study is fairly representative of the larger sample. Third, division into groups based on threat appraisal led to vastly different group sizes. This limits comparison between the groups, especially for the smallest group representing those who experienced primarily threat to life. Finally, the retrospective nature of this study makes it susceptible for biases in memory which may have affected participants' responses.

### **Conclusions and clinical implications**

In conclusion, there is converging evidence from this and other studies indicating that threat appraisal may play an important role in the development of PTSD. The experience of a life threat has up until now received more attention than social threat, but results from this study strongly establish the association between social threat and both PTSD and SAD. The experience of a threat to life may just be a part of what makes an experience traumatic, and this study strongly suggests that social threat may be just as important, or even more so. Furthermore, results indicate that when both types of threat are involved it often has severe consequences, possibly resulting in the development of severe psychological problems such as PTSD, SAD, and other types of psychopathology.

This is, of course, just a first step towards comparing these types of threat and it is important to continue this line of research. These results have important implications for future research focusing on the development of these different forms of psychopathology. A better understanding of trauma could have critical implications in clinical settings, since our understanding and conceptualization of trauma guides research and has a direct impact on both treatment development and who receives treatment following such an experience. Future research could, for example, have important implications in treatment development for those

who are traumatized following an experience involving a high degree of social threat, or both social threat and threat to life. Further research is needed to estimate whether, how, and to what extent we need to adapt our treatments to this novel approach and understanding of trauma. It is therefore important to continue this line of research in a clinical setting, further validating these compelling findings.

## References

- American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorder: DSM-III* (3rd edition). Washington, D.C.: Author.
- American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders: DSM-III-R* (3rd edition). Washington, D.C.: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders: DSM-IV* (4th edition). Washington, D.C.: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5* (5th edition). Washington, D.C.: Author.
- Avina, C., & O'Donohue, W. (2002). Sexual harassment and PTSD: Is sexual harassment diagnosable trauma? *Journal of Traumatic Stress, 15*(1), 69-75. doi: 10.1023/A:1014387429057
- Bandelow, B., Späth, C., Tichauer, G. Á., Broocks, A., Hajak, G., & Rüther, E. (2002). Early traumatic life events, parental attitudes, family history, and birth risk factors in patients with panic disorder. *Comprehensive Psychiatry, 43*(4), 269-278. doi: 10.1053/comp.2002.33492
- Bandelow, B., Torrente, A. C., Wedekind, D., Broocks, A., Hajak, G., & Rüther, E. (2004). Early traumatic life events, parental rearing styles, family history of mental disorders, and birth risk factors in patients with social anxiety disorder. *European Archives of Psychiatry and Clinical Neuroscience, 254*(6), 397–405. doi: 10.1007/s004060040521-2
- Beristianos, M. H., Maguen, S., Neylan, T. C., & Byers, A. L. (2016). Trauma exposure and



risk of suicidal ideation among ethnically diverse adults. *Depression and Anxiety*, 33(6), 495-501. doi: 10.1002/da.22485

Blanchard, E. B., Hickling, E. J., Mitnick, N., Taylor, A. E., Loos, W. R., & Buckley, T. C. (1995). The impact of severity of physical injury and perception of life threat in the development of post-traumatic stress disorder in motor vehicle accident victims. *Behaviour Research and Therapy*, 33(5), 529-534. doi: 10.1016/0005-7967(94)00079-Y

Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The Posttraumatic Stress Disorder Checklist for DSM- 5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress*, 28(6), 489–498. doi: 10.1002/jts.22059

Boals, A., & Schuettler, D. (2009). PTSD symptoms in response to traumatic and non-traumatic events: The role of respondent perception and A2 criterion. *Journal of Anxiety Disorders*, 23(4), 458–462. doi: 10.1016/j.janxdis.2008.09.003

Bodkin, J. A., Pope, H. G., Detke, M. J., & Hudson, J. I. (2007). Is PTSD caused by traumatic stress? *Journal of Anxiety Disorders*, 21(2), 176–182. doi: 10.1016/j.janxdis.2006.09.004

Bovin, M. J., Marx, B. P., Weathers, F. W., Gallagher, M. W., Rodriguez, P., Schnurr, P. P., & Keane, T. M. (2016). Psychometric properties of the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (PCL-5) in veterans. *Psychological Assessment*, 28(11), 1379–1391. doi: doi.org/10.1037/pas0000254

Brewin, C. R., Lanius, R. A., Novac, A., Schnyder, U., & Galea, S. (2009). Reformulating PTSD for DSM-V: Life after criterion A. *Journal of Traumatic Stress*, 22, 366–37. doi:

10.1002/jts.20443

- Butts, H. F. (2002). The Black mask of humanity: Racial/ethnic discrimination and post-traumatic stress disorder. *Journal of the American Academy of Psychiatry and the Law*, *30*, 336–339.
- Carleton, R. N., Peluso, D. L., Collimore, K., & Asmundson, G. J. G. (2011). Social anxiety and posttraumatic stress symptoms: The impact of distressing social events. *Journal of Anxiety Disorders*, *25*(1), 49–57. doi: 10.1016/j.janxdis.2010.08.002
- Chartier, M. J., Walker, J. R., & Stein, M. B. (2001). Social phobia and potential childhood risk factors in a community sample. *Psychological Medicine*, *31*(2), 307–315. doi: 10.1017/S0033291701003348
- Collimore, K. C., Carleton, R. N., Hofmann, S. G., & Asmundson, G. J. G. (2010). Posttraumatic stress and social anxiety: The interaction of traumatic events and interpersonal fears. *Depression & Anxiety*, *27*(11), 1017–1026. doi: 10.1002/da.20728
- Cromer, K. R., Schmidt, N. B., & Murphy, D. L. (2007). An investigation of traumatic life events and obsessive-compulsive disorder. *Behaviour Research and Therapy*, *45*(7), 1683-1691. doi: <https://doi.org/10.1016/j.brat.2006.08.018>
- Dewey, D., & Schuldberg, D. (2013). Criterion A, peritraumatic emotions, and posttraumatic stress disorder. *Traumatology*, *19*, 323–328. doi: 10.1177/1534765613496650
- Erwin, A. E., Heimberg, R. G., Marx, B. P., & Franklin, M. E. (2006). Traumatic and socially stressful life events among persons with social anxiety disorder. *Journal of Anxiety Disorders*, *20*(7), 896–914. doi: 10.1016/j.janxdis.2005.05.006

- Fontenelle, L. F., Cocchi, L., Harrison, B. J., Shavitt, R. G., do Rosário, M. C., Ferrão, Y. A., ... de Jesus Mari, J. (2012). Towards a post-traumatic subtype of obsessive–compulsive disorder. *Journal of Anxiety disorders*, *26*(2), 377-383. doi: 10.1016/j.janxdis.2011.12.001
- Forbes, D., Fletcher, S., Parslow, R., Phelps, A., O'Donnell, M., Bryant, R. A., . . . Creamer, M. (2012). Trauma at the hands of another: Longitudinal study of differences in the posttraumatic stress disorder symptom profile following interpersonal compared with noninterpersonal trauma. *The Journal of Clinical Psychiatry*, *73*(3), 372-376. doi: [10.4088/JCP.10m06640](https://doi.org/10.4088/JCP.10m06640)
- Ford, J. D., Stockton, P., Kaltman, S., & Green, B. L. (2006). Disorders of extreme stress (DESNOS) symptoms are associated with type and severity of interpersonal trauma exposure in a sample of healthy young women. *Journal of Interpersonal Violence*, *21*(11), 1399-1416. doi: 10.1177/0886260506292992
- Friedman, M. J., Resick, P. A., Bryant, R. A., & Brewin, C. R. (2011). Considering PTSD for DSM-5. *Depression and Anxiety*, *28*(9), 750–769. doi: 10.1002/da.20767
- Gilbert, P. (2002). Evolutionary approaches to psychopathology and cognitive therapy. *Journal of Cognitive Psychotherapy*, *16*(3), 263–294. doi: 10.1891/jcop.16.3.263.52515
- Gilboa-Schechtman, E., Shachar, I., & Helpman, L. (2014). Evolutionary perspective on social anxiety. In S. G. Hofmann & P. M. DiBartolo (Eds.), *Social anxiety: Clinical, developmental, and social perspectives* (pp. 599-622). San Diego, CA: Academic Press.
- Gold, S. D., Marx, B. P., Soler-Baillo, J. M., & Sloan, D. M. (2005). Is life stress more traumatic than traumatic stress? *Journal of Anxiety Disorders*, *19*(6), 687–698. doi: 10.1016/j.janxdis.2004.06.002

- Grant, D. M., Beck, J. G., Marques, L., Palyo, S. A., & Clapp, J. D. (2008). The structure of distress following trauma: Posttraumatic stress disorder, major depressive disorder, and generalized anxiety disorder. *Journal of Abnormal Psychology, 117*(3), 662. doi: 10.1037/a0012591
- 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. doi: 10.1177/1073191104269954
- Grey, N., & Holmes, E. A. (2008). “Hotspots” in trauma memories in the treatment of post-traumatic stress disorder: A replication. *Memory, 16*(7), 788-796. doi: 10.1080/09658210802266446
- Hackmann, A., Clark, D. M., & McManus, F. (2000). Recurrent images and early memories in Social Phobia. *Behaviour Research and Therapy, 38*(6), 601–610. doi: 10.1016/S0005-7967(99)00161-8
- Holbrook, T. L., Hoyt, D. B., Stein, M. B., & Sieber, W. J. (2001). Perceived threat to life predicts posttraumatic stress disorder after major trauma: Risk factors and functional outcome. *Journal of Trauma and Acute Care Surgery, 51*(2), 287-293.
- Holmes, E. A., Grey, N., & Young, K. A. (2005). Intrusive images and “hotspots” of trauma memories in posttraumatic stress disorder: An exploratory investigation of emotions and cognitive themes. *Journal of Behavior Therapy and Experimental Psychiatry, 36*(1), 3-17. doi: 10.1016/j.jbtep.2004.11.002
- Ingólfssdóttir, I. (2014). *Psychometric properties of the Icelandic version of the Generalized Anxiety Disorder-7* (unpublished B.Sc. thesis). Reykjavik University, School of Business.

- Jankovic, J., Bremner, S., Bogic, M., Lecic-Tosevski, D., Ajdukovic, D., Franciskovic, T., ... & Schützwohl, M. (2013). Trauma and suicidality in war affected communities. *European Psychiatry, 28*(8), 514-520. doi:10.1016/j.eurpsy.2012.06.001
- Kashdan, T.B., Frueh, B.C., Knapp, R.G., Hebert, R., Magruder, K.M. (2006). Social anxiety disorder in veteran's affairs primary care clinics. *Behaviour Research and Therapy, 44*(2), 233–247. doi: 10.1016/j.brat.2005.02.002
- Kessler, R. C., & Ustün, T. B. (2004). The World Mental Health (WMH) Survey Initiative version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *International Journal of Methods in Psychiatric Research, 13*(2), 93–121. doi: 10.1002/mpr.168
- Kilpatrick, D. G., Resnick, H. S., & Acierno, R. (2009). Should PTSD criterion A be retained? *Journal of Traumatic Stress, 22*(5), 374-383. doi: 10.1002/jts.20436
- Kilpatrick, D. G., Resnick, H. S., Milanak, M. E., Miller, M. W., Keyes, K. M., & Friedman, M. J. (2013). National estimates of exposure to traumatic events and PTSD prevalence using DSM-IV and DSM-5 criteria. *Journal of Traumatic Stress, 26*(5), 537–547. doi: 10.1002/jts.21848
- Kilpatrick, D. G., Saunders, B. E., Amick-McMullan, A., & Best, C. L. (1989). Victim and crime factors associated with the development of crime-related post-traumatic stress disorder. *Behavior Therapy, 20*, 199–214. doi: 10.1016/S0005-7894(89)80069-3
- Kisiel, C. L., Fehrenbach, T., Torgersen, E., Stolbach, B., McClelland, G., Griffin, G., & Burkman, K. (2014). Constellations of interpersonal trauma and symptoms in child welfare: Implications for a developmental trauma framework. *Journal of Family Violence, 29*(1), 1-14. doi: 10.1007/s10896-014-9603-8.

- Kroenke, K., & Spitzer, R. L. (2002). The PHQ-9: A new depression diagnostic and severity measure. *Psychiatric Annals*, *32*(9), 509–515. doi: 10.3928/0048-5713-20020901-06
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, *16*(9), 606–613. doi: 10.1046/j.1525-1497.2001.016009606.x
- Larsen, S. E., & Berenbaum, H. (2017). Did the DSM-5 improve the traumatic stressor criterion? Association of DSM-IV and DSM-5 criterion A with posttraumatic stress disorder symptoms. *Psychopathology*, *50*(6), 373–378. doi: 10.1159/000481950
- Larsen, S. E., & Pacella, M. L. (2016). Comparing the effect of DSM-congruent traumas vs. DSM-incongruent stressors on PTSD symptoms: A meta-analytic review. *Journal of Anxiety Disorders*, *38*, 37–46. doi: 10.1016/j.janxdis.2016.01.001
- Lecrubier, Y., Sheehan, D., Weiller, E., Amorim, P., Bonora, I., Harnett Sheehan, K., ... Dunbar, G. (1997). The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: Reliability and validity according to the CIDI. *European Psychiatry*, *12*(5), 224–231. doi: 10.1016/S0924-9338(97)83296-8
- Leskin, G. A., & Sheikh, J. I. (2002). Lifetime trauma history and panic disorder: Findings from the National Comorbidity Survey. *Journal of Anxiety Disorders*, *16*(6), 599-603. doi: 10.1016/S0887-6185(02)00125-1
- Lochner, C., du Toit, P. L., Zungu-Dirwayi, N., Marais, A., van Kradenburg, J., Seedat, S., ... Stein, D. J. (2002). Childhood trauma in obsessive-compulsive disorder, trichotillomania, and controls. *Depression and Anxiety*, *15*(2), 66-68. doi: 10.1002/da.10028

- Löwe, B., Decker, O., Müller, S., Brähler, E., Schellberg, D., Herzog, W., & Herzberg, P. Y. (2008). Validation and standardization of the Generalized Anxiety Disorder screener (GAD-7) in the general population. *Medical Care, 46*(3), 266-274. doi: 10.1097/MLR.0b 013e318160d093
- Martin, A., Rief, W., Klaiberg, A., & Braehler, E. (2006). Validity of the brief patient health questionnaire mood scale (PHQ-9) in the general population. *General Hospital Psychiatry, 28*(1), 71-77. doi: 10.1016/j.genhosppsy.2005.07.003
- McCabe, R. E., Miller, J. L., Laugesen, N., Antony, M. M., & Young, L. (2010). The relationship between anxiety disorders in adults and recalled childhood teasing. *Journal of Anxiety Disorders, 24*(2), 238–243. doi: 10.1016/j.janxdis.2009.11.002
- McMillan, K. A., Asmundson, G. J. G., & Sareen, J. (2017). Comorbid PTSD and social anxiety disorder: Associations with quality of life and suicide attempts. *The Journal of Nervous and Mental Disease, 205*(9), 732–737. doi: 10.1097/NMD.0000000000000704
- McMillan, K. A., Sareen, J., & Asmundson, G. J. G. (2014). Social anxiety disorder is associated with PTSD symptom presentation: An exploratory study within a nationally representative sample. *Journal of Traumatic Stress, 27*(5), 602–609. doi: 10.1002/jts.21952
- McNally, R. J. (2003). Progress and controversy in the study of posttraumatic stress disorder. *Annual Review of Psychology, 54*, 229–252. doi: 10.1146/annurev.psych.54.101601.145112
- McQuaid, J. R., Pedrelli, P., McCahill, M. E., & Stein, M. B. (2001). Reported trauma, post-traumatic stress disorder and major depression among primary care

patients. *Psychological Medicine*, 31(7), 1249-1257. doi:

10.1017/S0033291701004202

Ólafsson, E. H. (2018). *Psychometric properties of the Generalized Anxiety Disorder scale (GAD-7) in a sample of older individuals from the Icelandic population* (unpublished B.Sc. thesis). University of Iceland, School of Health Sciences.

Pálsdóttir, V. E. (2007). *Réttmæti sjálfsmatskvarðans Patient Health Questionnaire (PHQ) gagnvart greiningarviðtalinu Mini International Neuropsychiatric Interview (MINI) við að greina geðraskanir hjá heilsugæslusjúklingum* (unpublished B.S. thesis). University of Iceland, School of Health Sciences.

Read, J., Agar, K., Barker-Collo, S., Davies, E., & Moskowitz, A. (2001). Assessing suicidality in adults: Integrating childhood trauma as a major risk factor. *Professional Psychology: Research and Practice*, 32(4), 367. doi: 10.1037/0735-7028.32.4.367

Roberts, A. L., Dohrenwend, B. P., Aiello, A., Wright, R. J., Maercker, A., Galea, S., & Koenen, K. C. (2012). The stressor criterion for posttraumatic stress disorder: Does it matter? *The Journal of Clinical Psychiatry*, 73(2), e264. doi: 10.4088/JCP.11m07054

Robins, L. N., Wing, J., Wittchen, H. U., Helzer, J. E., Babor, T. F., Burke, J., ... Regier, D. A. (1988). The Composite International Diagnostic Interview: An epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures. *Archives of General Psychiatry*, 45(12), 1069–1077. doi: 10.1001/archpsyc.1988.01800360017003

Robinson, A. M., Kolts, R. L., & Watkins, P. C. (2006). A trauma by any other name: Examining college students' PTSD symptoms, posttraumatic growth, and depression



following exposure to negative life events. In M. V. Landow (Ed.), *Stress and mental health of college students* (pp. 203–224). New York: Nova Science.

Robinson, J. S., & Larson, C. (2010). Are traumatic events necessary to elicit symptoms of posttraumatic stress? *Psychological Trauma: Theory Research, Practice, and Policy*, 2, 71–76. doi: 10.1037/a0018954

Rosen, G. M., & Lilienfeld, S. O. (2008). Posttraumatic stress disorder: An empirical evaluation of core assumptions. *Clinical Psychology Review*, 28(5), 837–868. doi: 10.1016/j.cpr.2007.12.002

Roy, A. (2001). Childhood trauma and suicidal behavior in male cocaine dependent patients. *Suicide and Life-Threatening Behavior*, 31(2), 194-196.

Safren, S. A., Gershuny, B. S., Marzol, P., Otto, M. W., & Pollack, M. H. (2002). History of childhood abuse in panic disorder, social phobia, and generalized anxiety disorder. *The Journal of Nervous and Mental Disease*, 190(7), 453-456.

Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., ... Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I.): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *The Journal of Clinical Psychiatry*, 59(20), 22–33.

Sheehan, D., Lecrubier, Y., Harnett Sheehan, K., Janavs, J., Weiller, E., Keskiner, A., ... Dunbar, G. (1997). The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. *European Psychiatry*, 12(5), 232–241. doi: 10.1016/S0924-9338(97)83297-X

Siegel, R. S., La Greca, A. M., & Harrison, H. M. (2009). Peer victimization and social anxiety

- in adolescents: Prospective and reciprocal relationships. *Journal of Youth and Adolescence; New York*, 38(8), 1096–1109. doi: 10.1007/s10964-009-9392-1
- Sigurðsson, B. H. (2008). *Samanburður á tveimur stöðluðum greiningarviðtölum og tveimur sjálfsmatskvörðum: MINI, CIDI, PHQ og DASS* (unpublished cand. psych. thesis). University of Iceland, School of Social Sciences.
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092–1097. doi: 10.1001/archinte.166.10.1092
- Storch, E. A., Masia-Warner, C., Crisp, H., & Klein, R. G. (2005). Peer victimization and social anxiety in adolescence: A prospective study. *Aggressive Behavior*, 31(5), 437–452. doi: 10.1002/ab.20093
- Ullman, S. E., & Filipas, H. H. (2001). Predictors of PTSD symptom severity and social reactions in sexual assault victims. *Journal of Traumatic Stress*, 14(2), 369-389. doi: 0.1023/A:1011125220522
- Van Hooff, M., McFarlane, A. C., Baur, J., Abraham, M., & Barnes, D. J. (2009). The stressor criterion-A1 and PTSD: A matter of opinion? *Journal of Anxiety Disorders*, 23, 77–86. doi: 10.1016/j.janxdis.2008.04.001
- Weathers, F.W., Blake, D.D., Schnurr, P.P., Kaloupek, D.G., Marx, B.P., & Keane, T.M. (2013a). *The Life Events Checklist for DSM-5 (LEC-5)*. Instrument available from the National Center for PTSD at [www.ptsd.va.gov](http://www.ptsd.va.gov).
- Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013b). The PTSD Checklist for *DSM-5* (PCL-5). Scale available from the National

Center for PTSD at [www.ptsd.va.gov](http://www.ptsd.va.gov).

Wittchen, H.-U. (1994). Reliability and validity studies of the WHO-Composite International Diagnostic Interview (CIDI): A critical review. *Journal of Psychiatric Research*, 28(1), 57–84. doi: 10.1016/0022-3956(94)90036-1

World Health Organization. (1990). *Composite International Diagnostic Interview*. Geneva, Switzerland: World Health Organization (WHO).

Wortmann, J. H., Jordan, A. H., Weathers, F. W., Resick, P. A., Dondanville, K. A., Hall-Clark, B., ... Litz, B. T. (2016). Psychometric analysis of the PTSD Checklist-5 (PCL-5) among treatment-seeking military service members. *Psychological Assessment*, 28(11), 1392–1403. doi: 10.1037/pas0000260

Zisook, S., Chentsova-Dutton, Y., & Shuchter, S. R. (1998). PTSD following bereavement. *Annals of Clinical Psychiatry*, 10, 157–163.